N91192.AR.000226
NIROP FRIDLEY
5090.3a

WORK PLAN
REMOVAL ACTION AT NORTH FORTY

NIROP FRIDLEY
FRIDLEY, MINNESOTA

REVISION B
AUGUST 24, 1995

CONTRACT N62467-93-D-1106
DELIVERY ORDER 0014
STATEMENT OF WORK 015
TASK 1

Prepared For:

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
P. O. Box 190010
2155 Eagle Drive
North Charleston, South Carolina 29419-9010

Prepared By:

MORRISON KNUDSEN CORPORATION
2420 Mall Drive
Corporate Square 1 - Suite 211
North Charleston, South Carolina 29406

MEMORANDUM

September 12, 1995

FROM: PATRICK MOSITES, CODE 90A.MN

TO: DAVE CABINESS, CODE 18,69 SOUTHDIV

SUBJ: WORKPLAN REVIEW FOR NOFTH 40 REMEDIATION

ref: (a) UR WORKPLAN

encl: (1)

1. Reference(a) has been reviewed and overall I was quite pleased with it. The following comments are provided:

a). Par 3.4.2 page 11: No digging permit is required on site. However every attempt to locate existing utilities should be made.

b). Para 3.4.2 page 11: I'm not sure the contaminated water can be processed through system without causing an increase in the contamination level of the water which could exceed the limit for the Sanitary sewer requirement(No primary treatment of water is currently being done). This would need to be cleared through UDLP and the local Sewer authority.

c). Para 3.4.5 page 14: An extensive coordination meeting with UDLP should take place before work starts to discuss the disposition and responsibility of waste generated by the project. This may avoid problems we have had in the past with other projects.

d). Para 4.1 Page 16: See comment a) above regarding excavation permits. Hot work permits are provided by the Security/fire department at the plant.

e). Para 4.2 Page 16: The comment regarding permits for off-site disposal is confusing. Was the intent to say no permit is required for onsite disposal?

f). Para 8.2 Page 23: No munitions were manufactured at NIROP Fridley. Only naval guns and various armament systems.

COMMENTS ON SSHP:

a). Para 2.5.5 Page 7: Asbuilt drawings were provided to Mr. Urlich Cordon, MK, during his recent project in preparation for this project. Between the asbuilts and information/mapping he developed from the results of his study a detailed utilities map can be produced for this project at this time. This may save time

in the project execution. The facilities department will assist if necessary and would appreciate a copy of the drawing at the conclusion of the project.

b) Para 2.5.6 Page 7: Refer to comment d) above regarding Hot Work Permits.

c) Para 9.1 page 30: Be aware that the North 40 is still an operational area with a warehouse, laboratory and parking lots on the south and west perimeters. Any exclusion zones created that would affect these areas must be coordinated in advance to limit the effect on work schedules.

Sincerely,

F. Mosites
MP NIPOP FRIDLEY

****

COMMUNICATION CONFIRMATION REPORT

REICC MINNEAPOLIS MN

09-12-95 09:39 AM

****

INPUT TIME : 09:38 AM
TYPE : FILE
START TIME : IMMEDIATE
FILE NO. : F01 (02 PAGE)

NO.	TEL NO.	PASSWORD	RESULT	NO.	TEL NO.	PASSWORD	RESULT
001	92969707		GOOD				

MORRISON KNUDSEN CORPORATION
MK-FERGUSON GROUP
2420 MALL DRIVE
CORPORATE SQUARE ONE, SUITE 211
N. CHARLESTON, SC 29406

Transmittal Letter

Project Name: SOUTHDIV ERAC CONTRACT N62467-93-D-1106	Transmittal No. 94-4324-512 / Work Order No. 4324
	Date: August 25, 1995
To: Pat Mosites, REICC Minneapolis, Naval Industrial Reserve Ordnance Plant, 5001 East River Road, Minneapolis, MN 55421-1406	REFERENCES
	Item: DO 0014 NIROP Fridley - Work Plan
	Equipment No.
	Purchase Order No.
	Vendor Order No.

TRANSMITTED HEREWITH	FOR STATUS NOTED
For: ☑ Review and comment	Reviewed A
☐ Approval	Reviewed as Noted - Resubmit B
☐ Record	Not Reviewed - Resubmit C
☐ Information	For Information D

QUANTITY	ITEM	TITLE/DESCRIPTION

DO 0014, Statement of Work 015, Task 1 - NIROP Fridley, MN - WORK PLAN

The following documents have been issued for review and comment:

1) Work Plan for Removal Action at North Forty - Revision B, dated August 24, 1995
2) Appendix A - Site Safety and Health Plan - Revision B, dated August 18, 1995
3) Appendix B - Quality Control Plan - Revision B, dated August 24, 1995
4) Appendix D - Geophysical Investigation, prepared by Geosphere Midwest, Inc., dated July, 1995

Please direct all comments regarding this Work Plan, **no later than 14 SEP 1995,** to Remedial Project Manager, **David Cabiness**, SOUTHNAVFACENGCOM, Code 1869, 2155 Eagle Drive, P. O. Box 190010, N. Charleston, SC 29419-9010.

Addressee:

Sign and return one copy of Transmittal to:

Morrison Knudsen Corporation
2420 Mall Drive
Corporate Square 1, Suite 211
N. Charleston, SC 29406

at the above address within 10 working days.

Attachments
File 11-2.14 Library
File 11-10 T/L Only

The above listed documents have been received by:

Name: _____

Company Name: _____

Date Received: _____

By: [signature]

Name: Robert E. Hlavacek

Title: Program Manager, NAVFAC-SOUTHDIV

Transmittal Letter 94-4324-512, dated August 25, 1995
NIROP Fridley, MN - Work Plan for Removal Action at North Forty
Revision B, dated August 24, 1995 - Distribution List
Page Two

WBS 4324.0014.015.21.99.18.02

Distribution	Copies Required	
Tom Bloom U.S. Environmental Protection Agency Region V Remedial & Enforcement Response Branch OH/MN Section (HSRM-6J) 77 West Jackson Blvd Chicago, IL 60604-3690	2	
David Douglas Minnesota Pollution Control Agency Site Response Section Groundwater and Solid Waste Division 520 Lafayette Road St. Paul, MN 55155	2	
Kerry Morrow NAVSEA Technical Representative Naval Industrial Reserve Ordnance Plant 5001 East River Road Minneapolis, MN 55421-1406	1	
Doug Hildre United Defense LP Armament Systems Division 4800 East River Road Minneapolis, MN 55421	1	
Pat Mosites REICC Minneapolis Naval Industrial Reserve Ordnance Plant 5001 East River Road Minneapolis, MN 55421-1406	1	
SOUTHDIV		
Robert J. Meddick	T/L Only	
Jimmy Jones	T/L Only	
David Cabiness	3	1 EA APP D - Sent 7/31/95 T/L 94-4324-491
MORRISON KNUDSEN CORPORATION		
Elise Allen	1	Mike Finton to provide APP D
Mike Finton	1	2 EA APP D - Sent 8/01/95 T/L 94-4324-492
Willy Piispanen	1	
Scott Newman	T/L Only	
Laura Jants	1	
Ulrich Cordon	1	
File 11-2.14	1 Library	
File 11-10	T/L Only	

MORRISON KNUDSEN CORPORATION
MK-FERGUSON GROUP
2420 MALL DRIVE
CORPORATE SQUARE ONE, SUITE 211
N. CHARLESTON, SC 29406

Transmittal Letter

Project Name: SOUTHDIV ERAC CONTRACT N62467-93-D-1106	Transmittal No. 94-4324-814 / Work Order No. 4324
	Date: March 7, 1996
To: Kerry Morrow, NAVSEA Technical Representative, Naval Industrial Reserve Ordnance Plant, 4800 East River Road, Minneapolis, MN 55421-1406	REFERENCES
	Item: DO 0014 NIROP Fridley-Work Plan Addendum
	Equipment No.
	Purchase Order No.
	Vendor Order No.

TRANSMITTED HEREWITH	FOR STATUS NOTED
For: ☐ Review and comment ☐ Approval ☑ Record ☐ Information	Reviewed A Reviewed as Noted - Resubmit B Not Reviewed - Resubmit C For Information D

QUANTITY	ITEM	TITLE/DESCRIPTION

DO 0014 Statement of Work 015, Task 1 - NIROP FRIDLEY - Fridley, MN
Removal Action at North 40

The following document has been issued to Southern Division for approval:

1) Addendum to Work Plan, Revision B, dated February 21, 1996

Also attached is the response to comments received from David Cabiness, RPM, and the Minnesota Pollution Control Agency (MPCA).

Addressee:

Sign and return one copy of Transmittal to:

Morrison Knudsen Corporation
2420 Mall Drive
Corporate Square 1, Suite 211
N. Charleston, SC 29406

at the above address within 10 working days.

The above listed documents have been received by:

Name: _____

Company Name: _____

Date Received: _____

By: [signature]

Name: Robert E. Hlavacek

Title: Program Manager
NAVFAC-SOUTHDIV

Attachments
File 11-2.14 Library
File 11-10 T/L Only

Transmittal Letter 94-4324-814, dated March 7, 1996
NIROP Fridley, MN - Addendum to Work Plan, Revision B, dated February 21, 1996, and Response to Comments
Distribution List
Page Two

WBS 4324.0014.015.21.99.18.02

Distribution	Copies Required	Set ID No.
Tom Bloom U.S. Environmental Protection Agency Region V Remedial & Enforcement Response Branch OH/MN Section (HSRM-6J) 77 West Jackson Blvd Chicago, IL 60604-3690	2	64
David Douglas Minnesota Pollution Control Agency Site Response Section Groundwater and Solid Waste Division 520 Lafayette Road St. Paul, MN 55155	2	65
Kerry Morrow NAVSEA Technical Representative Naval Industrial Reserve Ordnance Plant 5001 East River Road Minneapolis, MN 55421-1406	1	67
Doug Hildre United Defense LP Armament Systems Division 4800 East River Road Minneapolis, MN 55421 (612) 572-6938	1	68
Pat Mosites REICC Minneapolis Naval Industrial Reserve Ordnance Plant 5001 East River Road Minneapolis, MN 55421-1406 (612) 572-6438	1	70
John Flora Director of Public Works 6431 University Avenue N.E. Fridley, MN 55432	1	126
SOUTHDIV		
Robert J. Meddick	T/L Only	
Jimmy Jones	T/L Only	
David Cabiness	3	66
MORRISON KNUDSEN CORPORATION		
Scott Newman	T/L Only	
Greg Hibbard - Project Manager	1	81
Elise Allen	1	41
Willy Piispanen	1	86
File 11-2.14 Library	1	12
File 11-10	T/L Only	

DELIVERY ORDER 0014

STATEMENT OF WORK 015

TASK 1

NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT

FRIDLEY, MINNESOTA

ADDENDUM TO WORK PLAN

REMOVAL ACTION AT NORTH 40

Revision: Addendum to Revision B

February 21, 1996

Prepared For:

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
P. O. Box 190010
2155 Eagle Drive
North Charleston, South Carolina 29419-9010

Prepared By:

MORRISON KNUDSEN CORPORATION
2420 Mall Drive
Corporate Square I, Suite 211
North Charleston, South Carolina 29406

SET ID NO: 67

WORK PLAN

ADDENDUM
REMOVAL ACTION AT NORTH 40

NIROP FRIDLEY
FRIDLEY, MINNESOTA

CONTRACT N62467-93-D-1106
DELIVERY ORDER #0014
STATEMENT OF WORK #015
TASK 1

REVISION: ADDENDUM TO REV B
FEBRUARY 21, 1996

Prepared For:

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
P.O. Box 190010
2155 Eagle Drive
North Charleston, South Carolina 29419-9010

Prepared By:

MORRISON KNUDSEN CORPORATION
2420 Mall Drive
Corporate Square 1 - Suite 211
North Charleston, South Carolina 29406

WORK PLAN

ADDENDUM
REMOVAL ACTION AT NORTH 40

NIROP FRIDLEY
FRIDLEY, MINNESOTA

CONTRACT N62467-93-D-1106
DELIVERY ORDER 0014
STATEMENT OF WORK 015
TASK 1

Revision: Addendum to Revision B
February 21, 1996

Prepared By:

MORRISON KNUDSEN CORPORATION
2420 MALL DRIVE
CORPORATE SQUARE 1, SUITE 211
NORTH CHARLESTON, SOUTH CAROLINA 29406

APPROVALS

MK Safety and Health Program Manager	06 Mar 96 Date
MK Quality Program Manager	6-Mar-96 Date
MK Sr. Project Manager	6 Mar 96 Date
MK Program Manager	6 Mar 96 Date

ACCEPTANCE

U.S. Navy Responsible Authority	Date

NIROP FRIDLEY
FRIDLEY, MN
WORK PLAN ADDENDUM TO REVISION B

INTRODUCTION

This addendum is to Revision B of the Work Plan issued August 24, 1995. The Minnesota Pollution Control Agency (MPCA) approved the Revision B documents, with comments, on December 26, 1995. These two documents, combined, outline the work activities to be performed by the Navy.

General Comment

All activities on site will be referred to as a removal action.

Page 2, Section 1.2.3

Delete the last sentence.

Page 4, Section 1.3.2

Replace section **1.3.2 Recommendations** with the following section:

1.3.2 Recommendations

Based on results of the geophysical investigations, 9 anomalous areas (A1 through A9) have been identified as the most likely to contain drum-size metallic debris. These areas shall be excavated to determine the type of material buried and to remove potential contamination sources. The anomaly does not imply the presence of drums or contaminants, only the presence of drum-size metal objects. It is conceivable that the buried debris may consist of building debris with rebar, old railroad tracks, or a variety of other metallic rubble. Five of the 42 smaller anomalies were selected by geophysical intensity and shall be excavated to determine the cause of the anomaly. The five selected anomalies are B-5, B-11, B-12, B-28, and B-30. It is unlikely that these isolated anomalies are related to single buried drums, but more to metal rubble. If no drums are encountered, further excavation will not be performed. If drums are encountered in the smaller anomalies, notifications will be made as described in section 3.3.1. After notifications are made, the Navy, the MPCA staff and the USEPA shall review the information gathered in the field and determine how to proceed with investigation of the remaining small anomalies.

Page 5, Section 2.0

Replace first two bullets with the following:

- SouthDiv must notify USEPA Region V and Minnesota Pollution Control Agency (MPCA) of the planned removal action.

- SouthDiv will provide NAVSEA a copy of the work plan.

Page 7, Section 3.2

Replace the second paragraph with the following:

For each particular excavation area, 3PC will be used on each definable feature of work. Definable features of work are the individual work activities associated with the work scope (e.g., site clearing, excavation, drum handling, etc.). The three phases in 3PC are: (i) the preparatory phase; (ii) the initial phase; and (iii) the follow up phase. These phases, and their associated inspections, identify "hold points" or check points, to allow evaluation of the work progress and to ensure quality requirements are being met.

Page 8, Section 3.3.1

Change the first sentence to read:

Local, state and federal agencies will be notified by MK of the removal action prior to commencing on-site work activities specified.

Replace the first two bullets with the following:

- The Navy shall provide public notification published in a local newspaper 60 days prior to commencement of the removal action with a 30 day public comment period.

- The Navy shall inform the Minnesota Pollution Control Agency (MPCA) of the work schedule two weeks before it is to start so that there is sufficient time to schedule on-site inspection of the excavation work.

Add the following bullet to the section:

- The Navy shall notify the MPCA if drums are encountered during the excavation of the five smaller anomalies.

Page 8, Section 3.3.2

First sentence, delete the word *interim.*

Replace the first two bullets with the following:

- Construction activities including:
  - a photographic log of each excavation.
  - a log and description of all removed objects.
- Discrepancies from the work plan;

Page 10, Section 3.1.4.4

Replace section **misnumbered 3.1.4.4** with the following:

3.4.1.4 Construct Decontamination Facilities

Prior to beginning work activities in conjunction with the removal action, decontamination facilities will be constructed as described in Section 7. Decontamination facilities will be constructed at or near each affected area within the North 40 as well as at a centrally located facility, as determined by field personnel.

Page 11, Section 3.4.2

Replace section **3.4.2** with the following:

3.4.2 Delineate Depth and Perform Excavations

A digging permit will be obtained after confirmation from the Site Safety and Health Officer (SSHO) prior to excavation. The soil in the anomaly area will be carefully excavated with a backhoe or trackhoe to a maximum depth of 10 feet or until obstructions are excavated or ground water is encountered. Metal detectors will also be used to scan each excavation following drum or debris removal to determine whether there is a possibility of buried and other debris. Each layer of soil will be removed and stockpiled. The process of careful probing by excavation will continue until the probing and metal detection techniques show that drums and other debris have been encountered. If drums are detected, the soil around the drum will be excavated to expose the drum sufficiently for proper inspection and removal. Visually impacted soil will also be excavated and staged with the drums.

Excavated soil will be temporarily stockpiled on a 6 mil polyethylene liner surrounded by strawbale berms. A stockpiling plan will be developed for each area, detailing planned locations for individual stockpiles and protective measures that will be used for protection of human health and the environment. Stockpile sampling will be as agreed to by MPCA and Navy for unanticipated conditions for apparently impacted soils. Any water entering the area of the excavation will be collected, containerized, characterized

and either transported off site for disposal or discharged to the sanitary sewer.

Subsurface removal of drums and debris shall require special precautions and safety considerations as detailed in the SSHP. Subsurface drum and soil removal will be conducted as described in Section 3.4.3.

Page 11, Section 3.4.3

Replace the second paragraph with the following:

If a drum shows potential internal pressure, evidenced by bulging, the work around that drum will proceed with extreme care. Movement of a pressurized drum will be performed with the use of a drum grappler or similar unit equipped for safe containment. The bulged drum will be moved only as far as necessary to allow seating on firm ground. The bulging drum will be placed in secondary containment and transferred to the temporary staging area. The drum will then be vented using a mechanical drum punch to relieve pressure. The SSHO and/or Project Manager will supervise this operation. All drums will be accumulated in accordance with Minnesota Hazardous Waste Regulation Part 7045.0292; staged in a bermed storage area. If, during drum removal, a drum breaks or otherwise leaks its contents before it can be overpacked, every effort will be made to recover any spilled material or soil that may become contaminated as a result of the release. This material or soil shall be sampled and handled according to paragraph 2, Section 3.4.2. Notification of this spill will be in accordance with Section 3.3 Notifications.

Page 13, Section 3.4.4

Replace the 5th bullet item with the following:

- Collect individual samples from each drum or combine compatible wastes to form a bulk waste and collect a sample from the bulk waste for disposal characterization;

Page 14, Section 3.4.6

Replace Section 3.4.6 with the following:

3.4.6 Backfill Placement

All excavations shall be surveyed to record the extent of the excavation and backfill requirements. Each excavation will be backfilled to grade after samples have been collected from the bottom of each excavation . The excavations will be backfilled after permission is received from the Navy. If additional backfill is necessary, clean backfill will be obtained from an off-site borrow source. Backfill shall be placed in 2 foot lifts and compacted to 85 % compaction.

The backfill will meet the following requirements:

- Less than three inches in diameter
- pH 5.5 to 8.5
- Less than 25% organic material

In areas of underground utilities, the backfill compaction will be 95% within 5 feet of the obstruction and 90% within 10 feet.

Page 15, Section 3.4.7

Replace the last sentence of the paragraph with the following:

All decontamination fluids shall be collected and sampled according to the CDAP. Water which meets the criteria shown on Table C-6 in the CDAP shall be discharged to the sanitary sewer. Water with chemicals exceeding the criteria on Table C-6 will be disposed off-site.

Page 20, Section 7.2

Replace Section 7.2 with the following:

7.2 DECONTAMINATION FACILITY

The location and number of decontamination facilities will be determined by field personnel. Decontamination facilities may be utilized by multiple excavation sites as determined by field personnel. Material used to construct the decontamination facilities that is in good condition may be moved and reused at subsequent sites. The facility will consist of a high density polyethylene (HDPE) liner draped over sandbags and sloped to a sump or collection area. A single sheet of HDPE will cover the base of the decontamination facility. The liner will be visually inspected prior to use, on a daily basis, to detect possible failures of the liner material. This liner will be inspected:

- for evidence of tears and holes;
- for evidence of seepage;
- to ensure that the sheeting is adequately fastened to the side walls;
- to ensure that the liner adequately covers the sand bags at the end sections; and
- to ensure that generated liquids can be contained until collected for disposal.

If damage is detected, the liner will be repaired or replaced before further use. Records will be maintained specifying decontamination facility construction materials and methods, disposition of liquids, and any repairs and/or breaches of liner integrity.

When the decontamination facility is not in use, it will be covered to minimize accumulation of rainwater.

When the decontamination facility is dismantled, the underlying material will be visually inspected. Visibly contaminated material will be removed and managed as a

contaminated waste.

Page 22, Section 8.0

Replace Section 8.0 with the following:

8.0 WASTE MANAGEMENT

Waste management, including disposal functions, will be conducted in accordance with this Waste Management Plan. Waste streams expected to be generated during this project will include:

- Buried drums and their contents;
- Impacted soil exceeding backfill criteria;
- General debris consisting of possibly concrete, wood or metal;
- Inert wastes (wood, HDPE, etc.)
- Decontamination and incidental water; and
- Personal protective equipment, clothing and discarded sample equipment.

Page 24, Section 8.4.1

Replace Section **8.4.1** with the following:

8.4.1 Produced Ground Water

Ground water encountered during excavation of the contaminated soil must be pumped from the excavation. Potentially contaminated produced ground water will be collected at each excavation site and sampled. Based on sample results, water will be discharged to the sanitary sewer or transported off site for ultimate disposition.

Page 25, Section 8.4.3

Replace Section 8.4.3 with the following:

8.4.3 Decontamination Water

Decontamination water is generated during steam cleaning or high-pressure wash of debris, excavation equipment and during manual decontamination of sampling equipment. Since the decontamination water is expected to contain low concentrations of the contaminants potentially found at the site, it will be collected and sampled. All water used in decontamination will be temporarily collected in 55-gallon drums at the point of generation. Decontamination water from all locations will be transferred to one 2,000-gallon tank for storage prior to disposal. Based on sample results, water will either be discharged to the sanitary sewer or transported off site for ultimate disposition.

Page 25, Section 8.4.5

Replace Section 8.4.5 with the following:

8.4.5 Spill Containment Plan

If a spill or release of hazardous materials occurs in the work area, the Contracting Officer's representative will be notified. If a spill occurs, the Spill Containment Plan, Section 16, of the SSHP, shall be followed. The SSHP (Appendix A of the Work Plan), contains a list of safety and spill control equipment available on site in the event of an emergency.

Page 33, Section 8, Attachment A

Replace **Attachment A** with the following (page 8 of addendum).

Page 42, Section 10 Schedule

Replace pages 43-51 in the August 24 version with the attached pages 9 and 10. The revised milestones for the project are as follows:

Mobilization	April, 1996
Construction Complete	July, 1996
Construction Completion Report	October, 1996

Add Section 13.0 PROJECT ORGANIZATION

Add the following pages (addendum pages 11-13) to the end of the work plan, after page 57.

ATTACHMENT A
DISPOSAL COORDINATOR FIELD KIT MATERIAL LIST

I. PROCEDURES AND REFERENCES

1) 49 CFR, PARTS 100-177;
2) MINNESOTA HAZARDOUS WASTE MANAGEMENT REGULATIONS;
3) 40 CFR, PARTS 260-299;
4) ALL APPLICABLE PROJECT SPECIFIC RULES, REGULATIONS, AND LICENSES (STATE HAZARDOUS MATERIAL REGULATIONS, ETC.);

II. PAPERWORK

1) BLANK BILLS OF LADING;
2) BLANK US EPA UNIFORM HAZARDOUS WASTE MANIFESTS AND STATE MANIFESTS AS APPLICABLE;
3) ALL PROJECT SPECIFIC PAPERWORK (STATE OF MINNESOTA HAZARDOUS WASTE MANIFESTS, WASTE CERTIFICATION FORMS, PRIOR NOTIFICATION FORMS, ETC.).

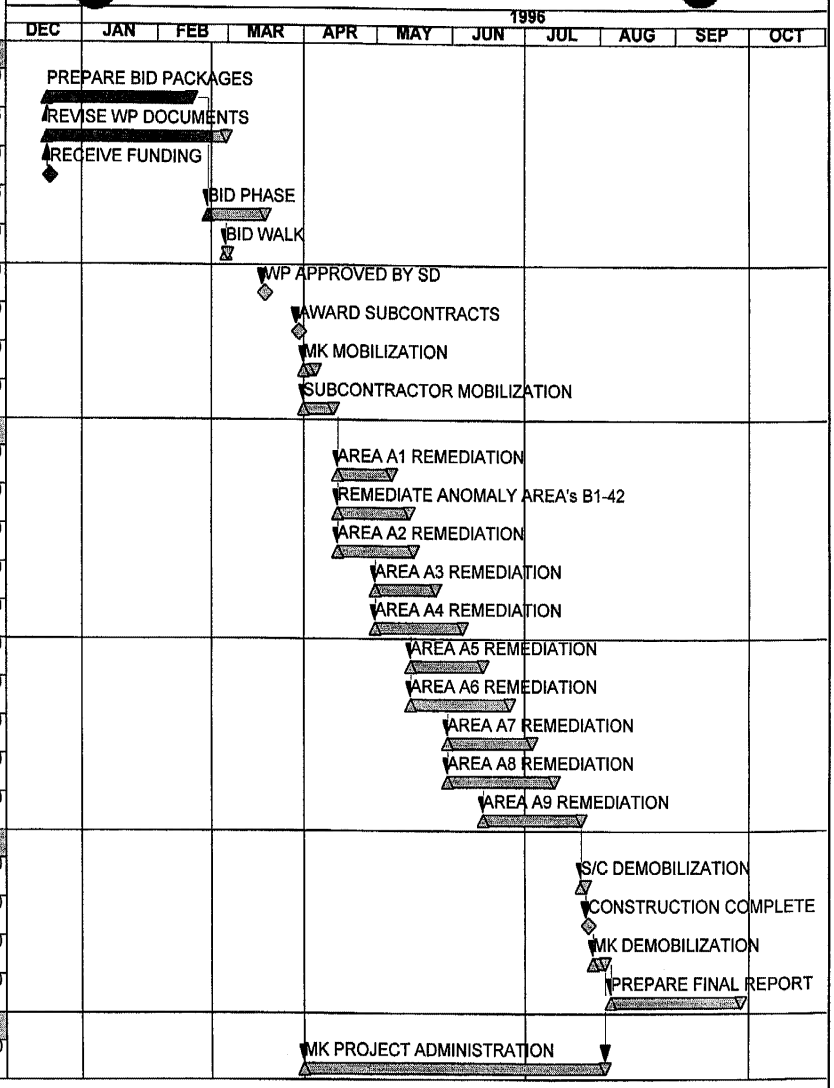
III. LABELS AND MARKINGS

1) WASTE CLASS AND STABILITY STICKERS;
2) ITEM NO. AND WEIGHT STICKERS;
3) HAZARDOUS MATERIALS LABELS;
4) "7A TYPE A" STICKERS;
5) HAZARDOUS WASTE CONTAINER LABELS;
6) PERMANENT MARKERS (2) AND PENS (2);
7) HAZARDOUS MATERIALS PLACARDS;
8) PROJECT SPECIFIC MARKINGS AND LABELS AS REQUIRED.

IV. TOOLS AND MATERIALS

1) 12" CRESCENT WRENCH (1);
2) 15/16" COMBINATION WRENCH (2);
3) HALF ROUND NEOPRENE GASKETS AND SILICONE GREASE (IF SHIPPING DRUMS);
4) OTHER TOOLS, MATERIALS, AND INSTRUMENTATION AS REQUIRED BY PROJECT.

Activity description	Early start	Early finish	Rem Dur	%
MOBILIZATION				
PREPARE BID PACKAGES	18DEC95A	14FEB96A	0	100
REVISE WP DOCUMENTS	18DEC95A	28FEB96	4*	93
RECEIVE FUNDING		18DEC95A	0	100
BID PHASE	22FEB96A	15MAR96	16*	6
BID WALK	29FEB96	29FEB96	1	0
WP APPROVED BY SD		15MAR96*	0	0
AWARD SUBCONTRACTS		29MAR96*	0	0
MK MOBILIZATION	01APR96	05APR96	5	0
SUBCONTRACTOR MOBILIZATION	01APR96	12APR96	10	0
REMEDIATION ACTIVITY				
AREA A1 REMEDIATION	15APR96	06MAY96	16	0
REMEDIATE ANOMALY AREA's B1-42	15APR96	13MAY96	21	0
AREA A2 REMEDIATION	15APR96	15MAY96	23	0
AREA A3 REMEDIATION	30APR96	24MAY96	19	0
AREA A4 REMEDIATION	30APR96	04JUN96	26	0
AREA A5 REMEDIATION	15MAY96	13JUN96	22	0
AREA A6 REMEDIATION	15MAY96	24JUN96	29	0
AREA A7 REMEDIATION	30MAY96	03JUL96	25	0
AREA A8 REMEDIATION	30MAY96	12JUL96	32	0
AREA A9 REMEDIATION	14JUN96	23JUL96	28	0
DEMOBILIZATION				
S/C DEMOBILIZATION	24JUL96	25JUL96	2	0
CONSTRUCTION COMPLETE		26JUL96	0	0
MK DEMOBILIZATION	29JUL96	02AUG96	5	0
PREPARE FINAL REPORT	05AUG96	27SEP96	40	0
SITEWIDE				
MK PROJECT ADMINISTRATION	01APR96	02AUG96	90	0



Project Start	01MAR94
Project Finish	30APR97
Data Date	23FEB96
Plot Date	06MAR96

Early Bar
Progress Bar

(c) Primavera Systems, Inc.

4324

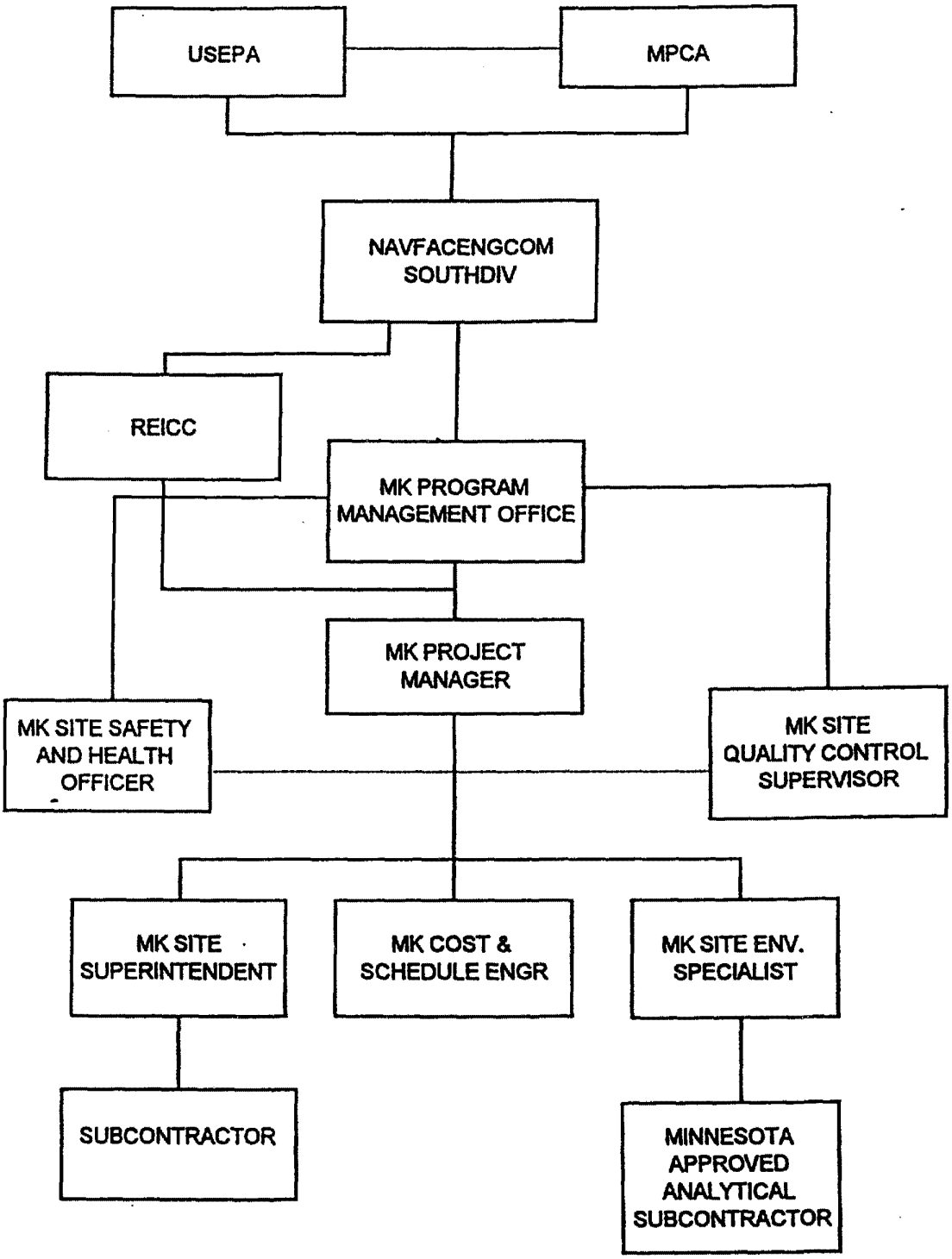
SOUTHDIV ERAC PROGRAM - WO #4324
NIROP FRIDLEY, MINNESOTA
DO#0014, SOW#015, PH 3 SCHEDULE

Sheet 1 of 1

MORRISON KNUDSEN CORPORATION

Date	Revision	Checked	Approved

13.0
PROJECT ORGANIZATION



PROJECT RESPONSIBILITIES	
TEAM MEMBERS	**RESPONSIBILITIES**
NAVFACENGCOM SouthDiv	Overview of project execution and coordination between Contractor, NIROP Fridley, and other agencies.
Program Management Office (PMO)	Overall responsibility for all cleanup measures at all sites in the Southern Division of the Naval Facilities Engineering Command under Contract No. N62467-93-D-1106. The PMO is the point of contact for SouthDiv.
Resident Engineer in Charge of Construction (REICC)	SouthDiv's on-site representative and is the liaison between NIROP officials and the Project Manager.
Project Manager (PM)	Overall responsibility for implementing this Work Plan and all other project activities. The PM will control all on-site forces to ensure completion of project tasks. • Single point of contact for liaison. • Coordinates the project resources to ensure compliance with the appropriate plans, procedures, and regulatory requirements, • Oversees all personnel on-site and coordinates with the Program Management Office (PMO).
Site Superintendent	Reports to the PM and will act as the Assistant Project Manager. Has primary responsibility for the coordination and control of all field activities to ensure that all tasks included in this Work Plan are completed. • Directs and coordinates the activities of all on-site subcontractors. • Provides daily reports to the PM on the status of field activities.
Cost and Schedule Engineer	Reports to the PM and has primary responsibility for the maintenance of the cost and schedule control systems, including regular assessments of performance. • Provides administrative support services. • Evaluates cost and schedule information and provides status reports. • Prepares monthly progress reports. • Reviews cost/schedule submissions by subcontractors. • Verifies progress against payment requests. • Maintains the document control system. • Maintains contract change notice log and trend logs.

PROJECT RESPONSIBILITIES	
TEAM MEMBERS	**RESPONSIBILITIES**
Site Environmental Specialist	Reports to PM and has the responsibility for environmental and waste disposal issues. • Performs field screening. • Coordinates with Site Superintendent on sample collection and on-site laboratory testing. • Directs the activities of the off-site laboratory testing subcontractor. • Coordinates off-site waste disposal.
Site Safety and Health Officer (SSHO)	Reports to the PMO. Implements and ensures compliance with the Task-Specific Site Safety and Health Plan (SSHP). Tracks and reports on safety-related matters. • Responsible for the control and elimination of existing and potential industrial hazards. • Implements and executes personnel monitoring program to ensure proper monitoring of internal and external exposures. • Provides site-specific training to personnel as required by the SSHP. • Tracks all personnel training requirements, survey data, certifications, and records to ensure compliance with plans and regulations. • Assists in developing and implementing the SSHP. • Reviews and approves subcontractor Safety and Health Plans and Programs. Conducts audits as appropriate to ensure compliance. • Reviews and approves work permits for appropriate industrial hygiene and safety controls. • Provides monitoring to ensure the protection of project personnel, the public, and the environment, • Maintains an inventory of industrial hygiene and safety supplies as appropriate. • Maintains monitoring equipment and calibration records. • Stops work when necessary to ensure the safety of personnel and to prevent damage to the environment.
Site Quality Control Supervisor (SQCS)	Reports to the PMO and has primary responsibility for verifying a consistently high level of quality for the project. • Reviews and checks all documents, reports, and testing results. • Coordinates with procurement, engineering, and cost/schedule departments. • Observes all field activities to ensure compliance with this Work Plan and completes Field Inspection Checklists (Appendix B). • Keeps minutes of the periodic quality meetings. • Implements the three phases of quality control: Preparatory, Initial, and Follow-up inspections. • Ensures tracking and resolution of nonconformance/rework items.

ADDENDUM TO APPENDIX A
SITE SAFETY AND HEALTH PLAN

Replace Section 2.5.5 with the following:

Page 7, Section 2.5.5
Underground utilities have been identified in the Geophysical report and compared to facility utility drawings. All utility identification and markings will be coordinated by MK and surface markings shall be provided by the Excavation Subcontractor. The MK Project Engineer or designee will work with United Defense's Facilities Engineering Department and Subcontractor to reverify the facilities utility drawings against the Geophysical Survey results prior to excavation activities. MK will notify United Defense and the public utility locate service at least five working days in advance of excavation activities. A site walk shall be conducted after surface markings have been completed as a final check to assure agreement between all parties involved. Personnel attending the walk shall include facilities engineering, public utility locate service, MK, and the Excavation Subcontractor. An MK Excavation and Trenching Permit system shall be implemented. MK's Excavation Subcontractor shall use metal detectors during the excavation process to locate and quantify the size of the underground anomaly or designated utility. Energy control will be anticipated as necessary when excavating near the propane storage tanks related lines and the street light cable conduit. The extent of energy control on the interpreted utility corridor will be determined in the field. When energy control is anticipated for underground utilities, the requirements established in MK Project Procedure 01.1 shall be followed. See also Section 2.5.7 that follows.

Page 7, Section 2.5.6
Replace the second sentence of **Section 2.5.6** with the following:

The NIROP Fridley Hot Work Permit shall be obtained from the facility security office and completion of the report coordinated by the MK SSHO.

Page 30, Section 9.1
Replace the first sentence of the second paragraph of **Section 9.1** with the following:

Prior to the commencement of field activities, Work Zones shall be established by the Subcontractor with the approval of MK and United Defense as necessary to meet operational and safety objectives.

ADDENDUM TO APPENDIX C
CHEMICAL DATA ACQUISITION PLAN

The following changes shall be incorporated into the Chemical Data Acquisition Plan:

Section 2.0
Replace Section **2.0 OBJECTIVES** with the following text:

2.0 OBJECTIVES

The overall objective of this removal action is to excavate and dispose of drums which may potentially cause an imminent threat to human health and the environment at the NIROP at Fridley. Based on previous geophysical surveys, several anomalies have been detected. Fourteen of the anomalous areas will be excavated to determine if buried drums exist.

Once drums are uncovered, the following sampling events will be performed:

- Field screen and make visual observations of unopened drums.
- Open drums and visually describe contents. Collect samples for compatibility testing by a mobile laboratory.
- Based on field characterization results and compatibility testing, bulk contents if possible.
- Collect composite samples for hazardous waste characterization parameter analysis by an offsite laboratory.
- Complete waste profiles for the bulked drum contents based on the offsite laboratory results.
- Collect confirmation soil samples from drum excavation areas.
- Collect samples from excavated soil proposed for use as backfill to determine if re-use criteria are met.
- Collect samples for off-site disposal from debris, visually-impacted soil and soil which exceeds the re-use criteria.
- Support health and safety requirements.

Data collection objectives are summarized in Table C-1.

Delete Sections **3.2 EXCAVATION SUBCONTRACTOR** and **3.3 DRUM SAMPLING SUBCONTRACTOR**, and replace with the following text:

3.2 SUBCONTRACTOR

- Excavation of soil and drums within areas specified by MK and the NAVY.
- Removal of drums from excavation.
- Removal and repacking of drum contents from deteriorated drums.
- Opening of bulging or unstable drums (automatic).
- Manual opening of drums, as directed by the Site Superintendent, Project

Manager and/or Project Engineer.

- Collection of samples from drums.
- Field characterization of samples (service to be provided by on-site laboratory).
- Oversight and contracting, as applicable, of mobile laboratory facilities.
- Inventory and documentation of drums and contents.
- Removal and overpacking of leaking drums.
- Movement of drums, containers or pallets between staging areas and the excavation areas.
- Bulking drum contents, under the direction of MK.

Section 6.0
Insert the following text at the beginning of **Section 6.0 SAMPLING AND ANALYSIS - OFFSITE CHARACTERIZATION**.

6.0 SAMPLING AND ANALYSIS - OFF-SITE CHARACTERIZATION

Off-site analysis of confirmatory soil samples and disposal samples shall be performed by a laboratory approved by the United States Environmental Protection Agency or listed in *Certified Environmental Testing Laboratories* (Public Health Laboratory Division - Minnesota Department of Health, January 10, 1996).

Section 6.1.5
Replace **Section 6.1.5, Rolloff or stockpiled soils/debris** with the following text:

6.1.5 Stockpiled soils/debris

Soil and debris removed during the drum excavation shall be placed in temporary stockpiles. Material which is potentially impacted, based on visual observation, will be segregated and sampled. Impacted soils from each excavation shall not be commingled.

Wastes shall be stored at the site for a period not to exceed 90 days.

Samples will be collected from impacted soil in a manner and at a frequency agreed to by the MPCA and the Navy. Target compounds are listed in Table C-4 (attached). This list may be abbreviated based on evaluation of drum contents.

General procedures for stockpile sampling include the following:

1. Using a hand-auger, trier, scoop or other appropriate sampling equipment, collect grab samples from the stockpile. Locations will be designated by the Project Engineer or designee. The sampling device shall be inserted approximately six inches into the soil. Mix the grab samples from a single stockpile in a stainless steel bowl to form a single composite sample. Assure that sufficient volume has been collected and composited to fill all sample containers, with the exception of volatile organic compounds.

2. Samples to be tested for VOCs shall not be composited. Collect a single grab sample from the center of the pile, or from an area potentially high in contamination (i.e. oily soil).

3. Transfer the grab sample (VOCs) or composite sample material (all other analyses) to the appropriate certified clean sample containers. See Table C-4 (formerly Table C-3 - see note under Tables below) for bottle size requirements and holding times. Fill the containers in the order shown on the table. The sampler shall also collect sufficient sample volume for disposal analyses (reactivity, ignitability, TCLP-VOCs, TCLP-SVOCs, TCLP-pesticides and TCLP-inorganics). Each of the disposal analysis bottles shall be labeled "Hold Until Further Notice." These sample containers shall be stored on site in a refrigerator or cooler designated for this purpose, pending evaluation of results from the regular analysis.

4. Soil pH shall be measured by the laboratory for the regular samples. Corrosivity (pH) samples have a short holding time (2 days) and will not be stored. If corrosivity samples are collected (disposal analysis), they will be submitted immediately with the regular samples.

5. Clean the exterior of the sample container and ensure that the container is tightly sealed before applying the sample label.

6. Submit samples of stockpiled soil for regular analysis. The parameters listed in Table C-5 will be analyzed.

   The results of the regular analysis will be compared to the screening levels listed in Table C-5. If screening levels are exceeded for a particular sample, disposal samples will be submitted for analysis. If screening levels are not exceeded, the MK Project Manager and Navy representative will evaluate the use of the associated stockpiled soil for use as backfill. If the stockpiled soil is used as backfill, the disposal samples will be discarded into the stockpile from which they originated. Empty sample containers shall be disposed with the other solid sampling wastes.

7. Submit samples from impacted soil (i.e. not potential backfill) for disposal analyses as shown on Table C-4.

Section 6.3
Replace **Section 6.3, WATER SAMPLES** with the following text:

6.3 WATER SAMPLES

During remedial activities, surface water may infiltrate into the excavation. This water will be pumped from the excavation into a tank or drum, depending on the volume. A water sample shall be collected from each container in accordance with the procedure

included in Section 6.1.3. Care shall be taken not to disturb the settled solids at the tank or drum bottom when collecting the sample.

If a pump is utilized, water will be pumped from the tank at a low rate (<200 ml/min for VOCs) and 5 gpm or less for other constituents. Samples shall be collected and submitted for analysis of the sanitary sewer discharge parameters, as indicated on Table C-4. If any discharge criteria are exceeded, the samples shall be analyzed for additional disposal requirements (also shown on Table C-4).

It is anticipated that data from discharge parameter analysis will be used for disposal characterization, if necessary. Additional volume will be sampled and analyzed for reactivity, ignitability and other parameters as required by the disposal facility. Water pH will be measured during discharge parameter analysis.

TABLES
Changes to tables are summarized below:

Table C-2:	Replace the current version with the attached revision.
Tables C-3/C-4:	Change Table C-3 to Table C-4, and replace with the attached revision. Insert new Table C-3 titled "Data Collection Locations" between Table C-2 and Table C-4.
Table C-5:	Insert the attached new Table C-5 titled "Screening Levels for Soil Analyses."
Table C-6:	Insert the attached new Table C-6 titled "Sanitary Sewer Water Discharge Limitations."

Table C-2. Field Equipment List (Master)

Category/item	Quantity	Collected	Category/item	Quantity	Collected
Soil Sampling			**Miscellaneous**		
small stainless steel spoons			sample containers from lab		
large stainless steel spoons or trowels			trip blanks from lab		
stainless steel bowls			sample refrigerator		
grey tape			large garbage bags		
shovel			scissors		
hand auger and attachments			tools (pliers, wrenches)		
drums for cuttings and sample wastes			steel tape/measuring tape		
aluminum foil			ruler		
drive samplers and brass sleeves			stopwatch		
Drum/tank Contents			5.5 gallon bucket		
drum thieves			camera and film		
coliwasas			surveyor tape		
disposable bailers			cellular phone/2-way radio		
stainless steel bailer			extra batteries for meters		
weighted bottle sampler			paper towels		
pinpoint sampler			clear plastic cups		
peristaltic pump and tubing					
car battery (power for pump if needed)			**Sample Shipping**		
flow regulator (valve)			coolers from lab		
extra bottle preservative			ice		
pH paper			Ziploc freezer bags (gallon and quart)		
non-sparking drum wrench			bubble wrap		
			strapping tape		
Decontamination			clear tape		
distilled water			thermometer, if requested by lab		
analyte free water (from lab)			fed ex airbills and envelopes		
10% nitric acid solution (from lab)					
acetone solution (from lab)			**Documentation**		
isopropanol solution (from lab)			field logbook or diary		
15-gallon tubs			sharpies		
brushes			sample labels		
pipe cleaner brushes			sample seals (CLP)		
Alconox, or equiv. non-phos. detergent			custody seals		
spray bottles			sample logbook		
chemical rinse tub			soil logging guidelines		
			Chemical Data Acquisition Plan		
			map of sampling locations		
			Site Safety and Health Plan		
			digging permits		
			Quality Control Plan		
			hot work permit (if req'd)		

Table C-2. Field Equipment List

Category/item	Quantity	Collected	Category/item	Quantity	Collected
Health and Safety			**Health and Safety**		
(rentals)			**(consumables)**		
OVM, FID or PID			CPR Pocket Masks		
Combustible Gas Indicator (CGI)			Dual station/eyewash station		
Isobutylene or other cal gas (PID)			Moist towelettes		
Methane (FID, CGI)			UL listed hazardous locations		
regulator (ask rental place)			Smoke Alarms		
Dust Monitor (mini-ram)			**(support documents)**		
Draeger tubes and handpump			copy of MK Safety manual		
(consumables)			(SouthDiv specific)		
Kimwipes (medium/large)			Copy of MK Industrial Hy-		
Respirators (note size)			giene Procedures Manual		
Chemical cartridges			Copy of MK Safety and		
HEPA cartridges			Health Program Desc. for		
Cleaner/sanitizer for respirators			Haz. Waste Site Operations		
PPE Covering Size:_____:			Copy of MK Accident Prev.		
Type:_____Size:_____:			Plan for SouthDiv Contract		
PPE gloves; Size:____Type:____			OSHA posters/ 2 OSHA		
PPE foot protection Size:_____:			200 forms		
Foam earplugs			Tool Box Talks (orange book)		
Safety Glasses			EM 85-1-1 Corps Safety Man.		
Silver cloth duct tape			Signed off SSHP/Work Plan		
Personal first aid kit			MK Accident Data Report		
Reflective safety vests			Form # 678/91		
Yellow "Caution" tape			MK Supervisor Accident In-		
PID Lamp Cleaner bottles			vestigation Report Form #		
Two 10-foot tygon tubing:			CAS 24/77		
10 feet - 0.25 inch I.D.			MK Daily Logbook Report		
10 feet - 0.125 inch I.D.			from SSHP		
Two 20lb. ABC dry chemical fire			MK Weekly Inspection		
extinguishers			Checklist forms from SSHP		
Bloodborne pathogen kits			PMO project procedures:		
			PHSP 001.1, 002.1, 003.1,		
			004.1, 005.1		
			Hardhats		
			29 CFR 1910, 29 CFR 1926		

Notes:

1. A checkmark is placed under the column "Collected" once the item is inventoried at the site.
2. The above list should be reviewed carefully, prior to work beginning, to make sure all necessary items are accounted for.

TABLE C-3
DATA COLLECTION LOCATIONS

Medium	Test Parameters	Number of Samples or Locations	QA/QC Samples[1]				Purpose
			TB[2]	ERB[3]	FD[4]	FB	
Field Measurements							
Field Screening of drums (outside and inside)	residual organic vapor, presence of explosive atmospheres	per drum (assume 50 for estimating)	N/A	N/A	N/A	N/A	Initial screening data to support health and safety requirements and characterize drums
Drum Contents	hazardous category/ compatibility criteria	per drum (assume 50 for estimating)	N/A	N/A	1 per 10 drums	N/A	Compatibility of drum contents for bulking; preliminary data for disposal characterization
Analytical (offsite) laboratory testing							
Base of Excavation Soil	select VOCs[6], select SVOCs[7], select metals[9], total cyanide, phenolics, sulfur, and total organic halogens	TBD (assume 26 for estimating)	7	5	3	1	Confirmation Sampling
Hazardous Soil	paint filter, ignitability, corrosivity, reactivity, TCLP-VOCs, TCLP-SVOCs, TCLP-metals, TCLP-pesticides	TBD (assume 3 for estimating)	0	1	0	1	Disposal characterization[5]
Stockpiled Soil (and debris)	select VOCs[6], select SVOCs[7], select metals[9], total cyanide, phenolics, sulfur, and total organic halogens	TBD (assume 23 for estimating)	7	5	2	1	Determine suitability for use as backfill[8]

TABLE C-3
DATA COLLECTION LOCATIONS

Medium	Test Parameters	Number of Samples or Locations	QA/QC Samples[1]				Purpose
			TB[2]	ERB[3]	FD[4]	FB	
Bulked Drum Contents: solids/sludges	Paint filter, ignitability, corrosivity, reactivity, TCLP-VOCs, TCLP-SVOCs, TCLP-metals, TCLP-pesticides	TBD (assume 12 for estimating)	0	2	1	0	Disposal Characterization[5]
Bulked Drum Contents: liquids	Ignitability, corrosivity, reactivity, VOCs (TCL), SVOCs (TCL), pesticides, RCRA metals	TBD (assume 4 for estimating)	0	0	1	0	Disposal Characterization[5]
Drummed oil	Btu, total chlorine, PCBs, fuel fingerprint (diesel range, gasoline range and total chromatographical organics), and ignitability	TBD (assume 2 for estimating)	0	0	1	0	Disposal characterization[5]
Decontamination water, incidental water in excavation	VOCs (method to be determined; either EPA 8021, EPA 601/602 or 8010/8020), cadmium, chromium, copper, cyanide, lead, mercury, nickel, zinc, pH, total petroleum hydrocarbons, total suspended solids, chemical oxygen demand	TBD (assume 3 for estimating)	1	0	1	1	Determine if acceptance criteria have been met (see Table C-6)

TABLE C-3
DATA COLLECTION LOCATIONS

Medium	Test Parameters	Number of Samples or Locations	QA/QC Samples[1]				Purpose
			TB[2]	ERB[3]	FD[4]	FB	

Notes:
TBD = to be determined (estimated totals are subject to change +/- 100%)
[1]QA/QC samples include trip blank (TB), equipment rinsate blanks (ERB), field duplicate (FD) and field blank (FB).
[2]Trip blanks will be analyzed for VOCs only.
[3]Rinsate blanks will be collected following completion of decontamination procedures. Blanks will be analyzed for associated parameters sampled for that day. N/A = not applicable
[4]Field duplicates will be collected at a rate of 1 per 20 (or less) samples collected for disposal characterization samples. Field duplicate samples will be collected at the rate of one in ten samples for excavation base and stockpile samples.
[5]Disposal parameters will be finalized pending discussion with the disposal facility.
[6]VOCs will include toluene, ethylbenzene, 1,1-dichloroethane, 1,1-dichloroethene, total 1,2-dichloroethene, 1,1,1-trichloroethane, trichloroethene, and tetrachloroethene.
[7]SVOCs will include carbazole, benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-c,d)pyrene.
[8]Screening levels in Table C-5 will be used to evaluate the suitability of excavated soil for use as backfill.
[9]Select metals include antimony, barium, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc.

TABLE C-4
SUMMARY OF ANALYTICAL METHODS

Analyte	Analytical Method	Sample Container	Preservation	Holding Time
Water Samples (blanks)				
Volatile Organics[5]	CLP SOW for organics[2]	3 40-mL glass vials	HCL to pH < 2, Ice to 4°C	10 days
Semivolatile Organic Compounds (SVOCs)[6]	CLP SOW for organics[2]	2 1-liter amber glass jar	Ice to 4°C	Extract in 5 days after receipt
Total Organic Halogens	9020A	1 500-mL glass jar	H_2SO_4 to pH < 2; Ice to 4°C	28 days
Phenolics	9066	1 1-liter amber glass jar	H_2SO_4 to pH < 2; Ice to 4°C	28 days
Select Metals[8]	6010A, 7471 (mercury)	1 1-liter plastic; 1 500-mL plastic (mercury)	HNO_3 to pH < 2, Ice to 4°C	28 days (mercury)1 80 days for other metals
Total Cyanide	9012	1 500-mL plastic	NaOH to pH > 12, Ice to 4°C	14 days
Sulfur	ASTM D-129-64	1 100-mL plastic	N/A	N/A
Water Samples for Sanitary Sewer Discharge (incidental water, decontamination water, etc.)				
Volatile Organics	8010/8020, 8021, or 601/602	3 40-mL glass vials	HCL to pH <2, Ice to 4°C	14 days

TABLE C-4
SUMMARY OF ANALYTICAL METHODS

Analyte	Analytical Method	Sample Container	Preservation	Holding Time
pH	EPA 150.1	1 50-ml plastic	Ice to 4°C	ASAP[3]
Total Petroleum Hydrocarbons	EPA 418.1	2 1-liter amber glass jars	H_2SO_4 to pH < 2; Ice to 4°C	28 days
Metals: chromium, mercury, cadmium, copper, lead, nickel and/or zinc	6010A, 7470 (mercury)	1 1-liter plastic; 1 500-mL plastic (mercury)	HNO_3 to pH <2; Ice to 4°C	mercury: 28 days all others: 180 days
Cyanide (Total)	9012	1 500-mL plastic	Ice to 4°C, NaOH to pH >12	14 days
Total Suspended Solids[7]	EPA 160.2	1 500-mL plastic	Ice to 4°C	7 days
Chemical Oxygen Demand[7]	EPA 410.4	1 100-mL plastic	H_2SO_4 to pH <2, Ice to 4°C	28 days
Water Samples - Additional Analyses Required for Disposal				
Ignitability	1010	1 1-liter plastic	None	ASAP[3]
Corrosivity-pH	9040B	1 1-liter plastic	Ice to 4°C	ASAP[3]
Sulfide Reactivity	SW-846 Methods: Volume C, Section 7.3.4.1	1 1-liter plastic	Ice to 4°C	7 days

TABLE C-4
SUMMARY OF ANALYTICAL METHODS

Analyte	Analytical Method	Sample Container	Preservation	Holding Time
Cyanide Reactivity	SW-846 Methods: Volume C, Section 7.3.3.2	1 1-liter plastic	Ice to 4°C	14 days
Soil Testing: Stockpiles (suitability for use as backfill) and Excavation Base (confirmatory)				
Volatile Organics[5]	CLP SOW for organics[2]	1 4-ounce glass jar	Ice to 4°C	10 days
Semivolatile Organics[6]	CLP SOW for organics[2]	1 8-ounce glass jar	Ice to 4°C	10 days until extraction
Total Organic Halogens	Modified 9020A	1 8-ounce glass jar	Ice to 4°C	N/A
Phenolics	9066	1 8-ounce glass jar	Ice to 4°C	28 days
Select Metals[8]	6010A, 7471 (mercury)	1 8-ounce glass jar	Ice to 4°C	28 days (mercury)1 80 days for all other metals
Total Cyanide	9012	1 8-ounce glass jar	Ice to 4°C	14 days
Sulfur	ASTM D-129-64	1 8-ounce glass jar	N/A	N/A

TABLE C-4
SUMMARY OF ANALYTICAL METHODS

Analyte	Analytical Method	Sample Container	Preservation	Holding Time
Soil and Drum Solids Disposal Testing				
Paint Filter Test	9095	1 8-ounce glass jar	none	N/A
Ignitability	1010	1 8-ounce glass jar	none	ASAP[3]
Corrosivity-pH	9045C	1 8-ounce glass jar	Ice to 4°C	ASAP[3]
Sulfide Reactivity	SW-846 Methods: Volume C, Section 7.3.4.1	1 8-ounce glass jar	Ice to 4°C	7 days
Cyanide Reactivity	SW-846 Methods: Volume C, Section 7.3.3.2	1 8-ounce glass jar	Ice to 4°C	14 days
TCLP - Organics and extraction (Method 1311)	8240	1 4-ounce glass jar	Ice to 4°C	14 days
	8270	2 8-ounce glass jars	Ice to 4°C	7 days until extraction
	8080A or 8081 (pesticides only)	1 8-ounce glass jar	Ice to 4°C	7 days until extraction
TCLP - inorganics[1]	1311 (extraction), 6010A, 7470A (mercury)	2 8-ounce glass jars	Ice to 4°C	Mercury: 28 days; Metals: 180 days

TABLE C-4
SUMMARY OF ANALYTICAL METHODS

Analyte	Analytical Method	Sample Container	Preservation	Holding Time
Drum Samples (Oil - non-CLP)				
Ignitability	1010	1-250 mL glass	N/A	30 days
BTU	ASTM D-240-76	1-100 mL glass jar	N/A	ASAP[3]
PCBs	8080A or 8081	1 50-mL glass jar	none	7 days
Fuel Fingerprint (DRO, GRO, TCO)	Modified 8015A[4]	1 100-mL glass jar	N/A	7 days
Total Chlorine	ASTM D 808-81	1 4-ounce glass jar	Ice to 4°C	28 days
Drum Samples (Liquids)				
VOCs - TCL	CLP SOW for organics[2]	4 40-mL glass vials	Ice to 4°C	10 days from extraction to analysis
SVOCs - TCL	CLP SOW for organics[2]	1 1-liter amber glass	Ice to 4°C	Extract in 5 days after receipt
Pesticides	8080A or 8081	1 1-liter amber glass	Ice to 4°C	7/40 days

TABLE C-4
SUMMARY OF ANALYTICAL METHODS

Analyte	Analytical Method	Sample Container	Preservation	Holding Time
Ignitability	1010	1 1-liter plastic	N/A	ASAP[3]
Corrosivity - pH	9040B	1 1-liter plastic	N/A	ASAP[3]
Sulfide Reactivity	SW-846 Methods: Volume C, Section 7.3.4.1	1 1-liter plastic	Ice to 4°C	7 days
Cyanide Reactivity	SW-846 Methods: Volume C, Section 7.3.3.2	1 1-liter plastic	Ice to 4°C	14 days
RCRA Metals (arsenic, barium, lead, mercury, chromium, cadmium, selenium and silver)	6010A, 7470 (mercury)	1 1-liter plastic; 1 500-mL plastic for mercury	Ice to 4°C	28 days (mercury)1 80 days for all other metals

Notes:

1. Graphite Furnace methods may be used to meet reporting limits for TCLP.
2. CLP SOW = Contract Laboratory Program Statement of Work. Reference is "Statement of Work for Organic Analysis" USEPA Contract Laboratory Program, Latest version. TCL = Target Compound List
3. "ASAP" indicates the sample must be analyzed as soon as possible. The sample will be shipped the day it is collected. Actual holding times will be provided by the lab.
4. The fuel fingerprint method will include analysis for diesel range organics (DRO), gasoline range organics (GRO), and total chromatographical organics (TCO).
5. VOCs will include toluene, ethylbenzene, trichloroethene, tetrachloroethene, 1,2-Dichloroethene (total), 1,1 Dichloroethene, 1,1,1-Trichloroethane and 1,1 Dichloroethane.
6. SVOCs will include carbazole, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)anthracene, chrysene, dibenzo(ah)anthracene and indeno(1,2,3-cd)pyrene.
7. Total Suspended Solids and Chemical Oxygen Demand may not be required for every water sample. Coordinate required analyses for water discharges with the appropriate base personnel.
8. Select metals include antimony, barium, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc.

TABLE C-5
SCREENING LEVELS FOR SOIL ANALYSES

Compound	Screening Level mg/kg	Compound	Screening Level mg/kg
Volatile Compounds- (CLP SOW)		*Semivolatile Compounds (CLP SOW)*	
Ethylbenzene	7,800[b]	Benzo(a)Anthracene	12[c]
1,1-Dichloroethane	0.08[a]	Benzo(a)pyrene	12[c]
1,1-Dichloroethene	22.6[a]	Benzo(b)fluoranthene	12[c]
Total 1,2-Dichloroethene	780[b]	Benzo(k)fluoranthene	12[c]
1,1,1-Trichloroethane	249.5[a]	Chrysene	12[c]
Tetrachloroethene	802[a]	Dibenzo(ah)anthracene	12[c]
Trichloroethene	1.2[a]	Indeno (1,2,3-cd)pyrene	12[c]
Toluene	16,000[b]	Carbazole	12[c]
Inorganics[d]			
Antimony	31[b]	Nickel	1,600[b]
Barium	5,500[b]	Silver	390[b]
Cadmium	39[b]	Zinc	23,000[b]
Chromium	390[b]	Copper	3,100[e]
Lead	400[b]	Cyanide	1,600[c]
Mercury	23[b]		

Notes:

[a]Value is from the document entitled "Attachment 3 to comments on the October 20, 1994, Letter from RMT Regarding Revisions to MPCA Soil Leaching Model Cleanup Numbers for OU2 Soils at NIROP."
[b]Value is from the USEPA document EPA 540/R-94/101 "Soil Screening Guidance", December, 1994. Values are for a pathway to surface soil (residential ingestion limit).
[c]Per conversation between Elise Allen (MK) and David Douglas (MPCA). Values are in relation to benzo(a) pyrene as an equivalent.
[d]These levels may be changed to background levels, pending discussion with the NAVY and review of data from previous investigations.
[e]Value is from Region III US EPA document entitled, "Risk-Based Concentration Table, July - December 1995," by Roy L. Smith, Ph.D. (residential ingestion limit).

TABLE C-6.
SANITARY SEWER WATER DISCHARGE LIMITATIONS
NIROP FRIDLEY

ANALYTE	STANDARD (mg/L)
Cadmium	2
Chromium - total	8
Copper	6
Cyanide - total	4
Lead	1
Mercury	0.1
Nickel	6
Zinc	8
pH - maximum (units)	11
pH - minimum (units)	5
Single Toxic Organic	3
Total Toxic Organics (total VOCs)	10
Total Hydrocarbons (from petroleum-related discharges)	100

Notes:
1. These standards are listed in the permit entitled, "Industrial Discharge Permit - Special Discharges," Permit No. 2154, Spill Location Code MP-NE-04-FR, issued by the Metropolitan Waste Control Commission.

NIROP Fridley, MN
DO 0014-015-21
Response to Comments, Work Documents
Rev B

Comments from David Cabiness, Code 1869
September 20, 1995

1) Section 2.0, page 5: Change first bullet to read: SOUTHDIV must notify USEPA Region 5 and MPCA of the planned removal action. Change the second bullet to read: SOUTHDIV will provide NAVSEA a copy of the work plan.

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MORRISON KNUDSEN CORPORATION
MK-FERGUSON GROUP
2420 MALL DRIVE
CORPORATE SQUARE ONE, SUITE 211
N. CHARLESTON, SC 29406

Transmittal Letter

Project Name: SOUTHDIV ERAC CONTRACT N62467-93-D-1106	Transmittal No. 94-4324-823 / Work Order No. 4324
	Date: March 13, 1996
To: David Cabiness, RPM Department of the Navy Southern Division Naval Facilities Engineering Command 2155 Eagle Drive Post Office Box 190010 Charleston, SC 29419-9010	REFERENCES Item: DO 0014 NIROP Fridley-Public Notice Equipment No.: Purchase Order No.: Vendor Order No.:

TRANSMITTED HEREWITH	FOR STATUS NOTED
For: ☐ Review and comment ☐ Approval ☑ Record ☐ Information	Reviewed A Reviewed as Noted - Resubmit B Not Reviewed - Resubmit C For Information D

QUANTITY	ITEM	TITLE/DESCRIPTION

DO 0014 SOW 015 TASK 1 - NIROP FRIDLEY - Fridley, Minnesota
North Forty Area

For your records, attached is the Public Notice for the Fridley project that was published February 29, 1996.

Attachment

R.J. Meddick	T/L Only
J. Jones	T/L Only
K. Morrow	
R.S. Newman	T/L Only
File 11-2.14	
11-10	T/L Only

By: R E Hlavacek

Name: Robert E. Hlavacek

Title: Program Manager
NAVFAC-SOUTHDIV

Focus News

AFFIDAVIT OF PUBLICATION

STATE OF MINNESOTA)
ss.
COUNTY OF ANOKA)

Richard Roberts, being duly sworn on an oath that he is the publisher or authorized agent and employee of the publisher of the newspaper known as Focus News, and has full knowledge of the facts which are stated below.

(A) The newspaper has complied with all of the requirements constituting qualification as a qualified newspaper, as provided by Minnesota Statute 331A.02, 331A.07 and other applicable laws, as amended.

(B) The printed (Official Publication) Public Notice U.S. Navy Accepting Public Comments on Plans to Conduct a "Visual Verification" Dig for Buried Drum at Naval Industrial Reserve Ordinance Plant in Fridley, MN which is attached, was cut from the columns of said newspaper, and was printed and published once each week, for 1 successive weeks; it was first published on Tuesday the 29 day of February, 1996, and was thereafter printed and published on every Tuesday to and including the _____day of February , 1996; and printed below is a copy of the lower case alphabet from A to Z, both inclusive, which is hereby acknowledged as being the size and kind of type used in the composition and publication of the notice:

abcdefghijklmnopqrstuvwxyz

By: Richard Roberts

Title: Publisher

Acknowledged before me on this
29 day of February, 1996.

COLLETTE KAERCHER ROBERTS
NOTARY PUBLIC
MINNESOTA
MY COMMISSION EXPIRES 01-31-00

Collette Kaercher Roberts
Notary Public

RATE INFORMATION

(1) Lowest classified rate paid by commercial users for comparable space $ 1.70 per line

(2) Maximum rate allowed by law for the above matter $ 1.70 per line

(3) Rate actually charged for the above matter $ .85 per line

Public Notice

The United States Navy is accepting public comments on plans to conduct a "visual verification" dig for buried drum at the Naval Industrial Reserve Ordinance Plant (NIROP) in Fridley, Minnesota. This visual verification is needed to support the finding of a geophysical investigation conducted in June, 1995, which located potential buried drums. Buried drums may contain potentially hazardous materials and removal actions will begin immediately upon location of any drums This drum investigation project is scheduled to begin in April, 1996. This action is being undertaken in cooperation with the United States Environmental Protection Agency (USEPA) and the Minnesota Pollution Control Agency (MPCA).

Public comments may be mailed to:
Mr. Patrick K. Morrow
NAVSEA TECHREP
5001 East River Road
Minneapolis, MN 55421-1406

Results of the June, 1995 geophysical investigation and work plans for the visual verification are available for public inspection during normal business hours by contacting Mr. Morrow at (612)572-6360 Public comments or questions will be received at a regularly scheduled Restoration Advisory Board meeting at 7.00 p.m on Thursday, April 18, 1996, in the Fridley Municipal Center, 6431 University Avenue, NE, Fridley, Minnesota. The U.S. Navy, the USEPA and the MPCA will be available at the public meeting to answer your questions

(February 29, 1996) Fridley, Columbia Heights Focus News

MORRISON KNUDSEN CORPORATION
MK-FERGUSON GROUP
2420 MALL DRIVE
CORPORATE SQUARE ONE, SUITE 211
N. CHARLESTON, SC 29406

Transmittal Letter

Project Name: SOUTHDIV ERAC CONTRACT N62467-93-D-1106	Transmittal No. 94-4324-837 / Work Order No. 4324
	Date: March 27, 1996
To: Pat Mosites, REICC Minneapolis, Naval Industrial Reserve Ordnance Plant, 4800 East River Road, Minneapolis, MN 55421-1406, (612) 572-6438	REFERENCES
	Item: DO 0014 NIROP Fridley-Work Plan Approval
	Equipment No.
	Purchase Order No.
	Vendor Order No.

TRANSMITTED HEREWITH	FOR STATUS NOTED
For: ☐ Review and comment ☐ Approval ☑ Record ☐ Information	Reviewed A Reviewed as Noted - Resubmit B Not Reviewed - Resubmit C For Information D

QUANTITY	ITEM	TITLE/DESCRIPTION

DO 0014 Statement of Work 015, Task 1 PHASE 3 - NIROP FRIDLEY - Fridley, Minnesota Removal Action at North 40

The following document has been approved by the U.S. Navy Responsible Authority:

Work Plan Addendum and associated appendices, Revision B, dated February 21, 1996

done

Please replace the approval sheet in your Work Plan(s) with the attached, signed acceptance form.

Addressee:

Sign and return one copy of Transmittal to:

Morrison Knudsen Corporation
2420 Mall Drive
Corporate Square 1, Suite 211
N. Charleston, SC 29406

at the above address within 10 working days.

The above listed documents have been received by:

Name: _____

Company Name: _____

Date Received: _____

By: [signature]

Name: Robert E. Hlavacek

Title: Program Manager
NAVFAC-SOUTHDIV

Attachments
File 11-2.14 Library
File 11-10 T/L Only

Distribution	Copies Required	Set ID No.
Tom Bloom U.S. Environmental Protection Agency Region V Remedial & Enforcement Response Branch OH/MN Section (HSRM-6J) 77 West Jackson Blvd Chicago, IL 60604-3690	2	64
David Douglas Minnesota Pollution Control Agency Site Response Section Groundwater and Solid Waste Division 520 Lafayette Road St. Paul, MN 55155	2	65
Kerry Morrow NAVSEA Technical Representative Naval Industrial Reserve Ordnance Plant 5001 East River Road Minneapolis, MN 55421-1406	1	67
Doug Hildre United Defense LP Armament Systems Division 4800 East River Road Minneapolis, MN 55421 (612) 572-6938	1	68
Pat Mosites REICC Minneapolis Naval Industrial Reserve Ordnance Plant 5001 East River Road Minneapolis, MN 55421-1406 (612) 572-6438	1	70
John Flora Director of Public Works 6431 University Avenue N.E. Fridley, MN 55432	1	126
SOUTHDIV		
Robert J. Meddick	T/L Only	
Jimmy Jones	T/L Only	
David Cabiness	3	66
MORRISON KNUDSEN CORPORATION		
Scott Newman	T/L Only	
Greg Hibbard - Project Manager	1	81
Elise Allen	1	41
Willy Piispanen	1	86
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Transmittal Letter

Project Name	Transmittal No. 94-4324-814	Work Order No. 4324
SOUTHDIV ERAC CONTRACT N62467-93-D-1106	Date March 7, 1996	

To:	REFERENCES
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DO 0014 Statement of Work 015, Task 1 - NIROP FRIDLEY - Fridley, MN
Removal Action at North 40

done

The following document has been issued to Southern Division for approval:

1) Addendum to Work Plan, Revision B, dated February 21, 1996

Also attached is the response to comments received from David Cabiness, RPM, and the Minnesota Pollution Control Agency (MPCA).

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DELIVERY ORDER 0014

STATEMENT OF WORK 015

TASK 1

NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT

FRIDLEY, MINNESOTA

ADDENDUM TO WORK PLAN

REMOVAL ACTION AT NORTH 40

Revision: Addendum to Revision B

February 21, 1996

Prepared For:

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
P. O. Box 190010
2155 Eagle Drive
North Charleston, South Carolina 29419-9010

Prepared By:

MORRISON KNUDSEN CORPORATION
2420 Mall Drive
Corporate Square I, Suite 211
North Charleston, South Carolina 29406

SET ID NO: 70

WORK PLAN

ADDENDUM
REMOVAL ACTION AT NORTH 40

NIROP FRIDLEY
FRIDLEY, MINNESOTA

CONTRACT N62467-93-D-1106
DELIVERY ORDER #0014
STATEMENT OF WORK #015
TASK 1

REVISION: ADDENDUM TO REV B
FEBRUARY 21, 1996

Prepared For:

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
P.O. Box 190010
2155 Eagle Drive
North Charleston, South Carolina 29419-9010

Prepared By:

MORRISON KNUDSEN CORPORATION
2420 Mall Drive
Corporate Square 1 - Suite 211
North Charleston, South Carolina 29406

WORK PLAN

ADDENDUM
REMOVAL ACTION AT NORTH 40

NIROP FRIDLEY
FRIDLEY, MINNESOTA

CONTRACT N62467-93-D-1106
DELIVERY ORDER 0014
STATEMENT OF WORK 015
TASK 1

Revision: Addendum to Revision B
February 21, 1996

Prepared By:

MORRISON KNUDSEN CORPORATION
2420 MALL DRIVE
CORPORATE SQUARE 1, SUITE 211
NORTH CHARLESTON, SOUTH CAROLINA 29406

APPROVALS

MK Safety and Health Program Manager	06 Mar 96 Date
MK Quality Program Manager	6-Mar-96 Date
MK Sr. Project Manager	6 Mar 96 Date
MK Program Manager	6 Mar 96 Date

ACCEPTANCE

U.S. Navy Responsible Authority	22 MAR 96 Date

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DEFINITIONS/ACRONYMS

DEFINITIONS :

Generator: Any person, by site, whose act or process produces hazardous waste identified or listed in 40 CFR part 261 or whose act first causes a hazardous waste to become subject to regulation.

Disposal Coordinator: The individual who performs one or more of the following functions for a waste generator:

a) Arranges for transportation of the waste;
b) Collects and/or consolidates shipments of waste; and/or
c) Manages waste in some manner.

This definition shall not apply to a carrier whose sole function is to transport waste.

Hazmat Employee: A person who in the course of employment directly affects hazardous materials transportation safety, including one who:

a) Loads, unloads, or handles hazardous materials;
b) Tests, reconditions, repairs, modifies, marks, or otherwise represents containers, drums, or packaging as qualified for use in the transportation of hazardous materials;
c) Prepares hazardous materials for transportation;
d) Is responsible for safety of transporting hazardous materials;
e) Operates a vehicle used to transport hazardous materials;
f) Prepares transportation documents;
g) Offers materials for transport; or is
h) Specifically trained as a Hazmat Employee per 49 CFR 172.700.

Solid Waste: Any discarded material defined as such by the Minnesota Regulations Chapter 7035 which adopts federal regulation 40 CFR 260.

Non-hazardous Waste: Any solid waste which is not defined as hazardous waste or otherwise regulated.

Hazardous Waste: Any refuse, sludge, or other waste material or combinations of refuse, sludge or other waste materials in solid, semisolid, liquid, or contained gaseous form which because of its quantity, concentration, or chemical, physical, or infectious characteristics may (a) cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or (b) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. Categories of hazardous waste material include, but are not limited to: explosives, flammable, oxidizers, poisons, irritants, and corrosives.

Hazardous waste does not include source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended. For details, refer to Minnesota Statues, Section 116.06 Pollution Control Agency, Subdivision 11.

TSD Facility: A Treatment, Storage, or Disposal Facility as defined by the USEPA for hazardous waste in 40 CFR 260.10 and 270.2.

Toxic Substance Control Act (TSCA) Waste: Any waste which is not RCRA listed or is not a characteristic hazardous waste but is a regulated substance as listed in 40 CFR 700 *et seq.*

Resource Conservation Recovery Act (RCRA) Waste: For the purposes of this procedure, RCRA wastes are material that may be solid, liquid, semisolid, and gaseous that are classified as a hazardous waste per 40 CFR 261.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): For the purposes of this procedure, CERCLA wastes or "hazardous substances" are defined by reference to substances that are listed or designated under other environmental statutes including:

ACRONYMS:

ASTM	American Society for Testing Materials
BTU	British Thermal Units
CAA	Clean Air Act
CDAP	Chemical Data Acquisition Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code Federal Regulations
CGI	Combustible Gas Indicator
CLP	Contract Laboratory Program
COC	Chain-of-Custody
COTR	Contracting Officers Technical Representative
CWA	Clean Water Act
DQO	Data Quality Objective
EPA	Environmental Protection Agency
ERAC	Environmental Remedial Action Contractor
ESC	Excavation Subcontractor
HazCat	Hazardous Category
HDPE	High Density Polyethylene
ICP	Inductively Coupled Plasma
LDR	Land Disposal Restrictions
MK	Morrison Knudsen Corporation
MPCA	Minnesota Pollution Control Agency
MSDS	Material Safety Data Sheets
NAVFAC	Naval Facilities Engineering Command
NEESA	Naval Energy and Environmental Support Activity

NFPA	National Fire Protection Association
NIROP	Naval Industrial Reserve Ordnance Plant
NPL	National Priority List
OSHA	Occupational Safety and Health Administration
OVM	Organic Vapor Monitor
PCBs	Polychlorinated Biphenyl
PID	Photoionization Detector
PPE	Personal Protective Equipment
PQM	Project Quality Manager
QAQC	Quality Assurance/Quality Control
QCP	Quality Control Plan
RCRA	Resource Conservation Recovery Act
REICC	Resident Engineer in Charge of Construction
RPD	Relative Percent Difference
SCBA	Self Contained Breathing Apparatus
SOP	Standard Operating Procedures
SOUTHDIV	Southern Division
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
TNT	Trinitrotoluene
TSA	Temporary Staging Area
TSCA	Toxic Substance Control Act
TSD	Treatment, Storage, and Disposal
USDOT	United States Department of Transportation
VOA	Volatile Organic Analysis
VOC	Volatile Organic Compound

1.0
INTRODUCTION

1.1 BACKGROUND AND OBJECTIVES

This work plan describes the removal actions to be undertaken at the area designated as the North 40 of the Naval Industrial Reserve Ordnance Plant (NIROP) in Fridley, Minnesota. The work plan was prepared by Morrison Knudsen Corporation (MK) for Naval Facilities Engineering Command (NAVFACENGCOM), Southern Division (SouthDiv), pursuant to the scope of work defined in Delivery Order #0014, Statement of Work #015, Task #1 under Contract #N62467-93-D-1106.

The primary objectives of the interim removal are to:

- Reduce the threat to human health and the environment by eliminating or substantially reducing the possible pathways of exposure from potentially hazardous substances at the North 40 of NIROP Fridley;

- Provide a removal action of the North 40 by removing all drums and their contents from the anomalous areas defined by the geophysical survey;

- Perform all work in a manner that maximizes worker safety and minimizes environmental impacts; and

- Cost-effectively and efficiently execute the work in accordance with the Delivery Order requirements while meeting or exceeding all site-specific, local, state, and federal requirements.

1.2 SITE DESCRIPTION

1.2.1 Background

As shown in Figure 1, NIROP Fridley is located near the twin cities of Minneapolis and St. Paul, Minnesota. The site began producing naval guns in 1941. The plant has diversified into the production of guided missile launching systems, various weaponry and hydraulic and electric power drive and control systems. The facility encompasses 138 acres. The federal government owns 83 acres which are operated by United Defense; the remaining 55 acres are owned and operated by United Defense.

The facility lies less than 1 mile south of Interstate 694 and approximately 1,000 feet east of the Mississippi River. The site is located on a broad, flat outwash terrace and is largely covered by pavement or buildings. The North 40 site, the subject of this Work Plan, encompasses approximately 22 acres and is located in the northern sector of the NIROP Fridley site, between Buildings 37 and 50.

1.2.2 Site Geology/Hydrogeology

Soils in the overall site area are of glacial origin consisting of coarse sand, fine to medium sand, and some gravelly sand; discontinuous layers of silt and clay occur at some locations. These unconsolidated deposits may have thicknesses of up to 150 feet. The groundwater gradient at the site is generally to the southwest. The static groundwater level at the site varies from approximately 804 to 816 feet above mean sea level (MSL).

1.2.3 Site Map of the North 40

A geophysical investigation was conducted at the North 40 area of NIROP Fridley in June of 1995 under a subcontract to MK. Within the North 40, there are 9 major areas of concern, evidenced by higher intensity geophysical anomalies and shown on Figure 2. In addition, 42 smaller, lesser intensity anomalies and the subsurface between the old building foundations on the extreme west side of the North 40 were identified and are shown also on Figure 2. ~~These areas will be investigated during this removal action.~~

1.2.4 Sampling Program Objectives

The primary sampling program objective at NIROP Fridley is to characterize the waste contained in excavated drums to ensure off-site disposal of the material is consistent with the RCRA hazardous waste requirements found at 40 CFR Part 260 *et seq.* and the Minnesota hazardous waste regulations found at Chapter 7045. Based on the results of analysis performed on these samples, the drummed waste can be separated into compatible groups for disposition.

Subsurface soil samples will also be collected and analyzed for possible future use in design and implementation of a remediation program, which is outside the scope of this work plan. SouthDiv has requested that these additional samples be collected and analyzed while the excavations are open and accessible as a practical approach to save time and costs. The analytical data from the soil samples will be submitted to Southern Division to enhance investigating if necessary for design of additional remediation.

1.2.5 Data Quality Objectives

Data Quality Objectives (DQOs) are qualitative and quantitative statements specifying the quality and quantity of data to be collected for each intended use. DQOs include identification of the need, use, quality, quantity and type of data to be collected. DQOs are developed to ensure that data of sufficient quantity and quality are collected to satisfy the project objectives. The DQOs apply primarily to the chemical analytical data that will be gathered, but can also apply to field-collected data such as geologic, geotechnical and hydrologic data. The analytical data gathered during the sampling program will be waste characterization data, used to determine appropriate off-site disposal requirements. The soil samples collected from the bottoms of the excavations will be used for future design and implementation of a remediation program, if

determined necessary based on the data.

1.2.6 Data Quality Indicators

Precision, accuracy, representativeness, completeness and comparability (PARCC) parameters are indicators of data quality. The parameters will be evaluated during assessment of the data collected during the removal action. A more detailed discussion of the PARCC parameters is found in the Chemical Data Acquisition Plan (CDAP) Appendix C.

1.3 GEOPHYSICAL SURVEY

1.3.1 Recent Geophysical Investigations

Geophysical investigations were performed at the NIROP North 40 site in June, 1995 by Geosphere Midwest (GSM). These investigations consisted of electromagnetic measurements using the EM31, EM34, and EM61 instruments to obtain data on ground conductivity and locate areas containing buried metallic debris. The purpose of using each instrument at this site is described below:

- The EM31 was used to locate areas with buried metal and areas with above-background conductivity; the exploration depth was approximately 20 feet.
- The EM34 was used to locate deeper (greater than 20 feet) conductive plumes.
- The EM61 (metal detector) was used to identify areas with buried metallic debris; the exploration depth was approximately 10 feet.

Additional and more detailed information on the geophysical investigations are included in the geophysical report bound separately and referred to as Appendix D.

1.3.1.1 Field Survey

Prior to initiating the geophysical investigations, the site was gridded with wooden stakes on 50 by 50 foot centers followed by a finer parallel 10 foot grid. This grid establishes the baseline for the survey and maintains an accurate control of the lines and station spacing.

The survey was conducted in a north-south direction along the 10 foot grid lines with measurements collected at five foot intervals (0.6 foot intervals for the EM61 survey). A total of 146 lines were traversed with the EM31 and EM61 using this grid; line density was increased in the area north of Building 37 due to visual identification of partially exposed drum debris in this area. The EM34 survey was limited to eight profile lines due to interference by cultural features such as metal fences and buildings. EM31 and EM61 data were processed and contoured as color maps over a base map of the site.

1.3.1.2 Results

Results of the EM31 survey clearly delineate areas containing buried metallic utilities (pipelines and cables) as well as surface and near-surface metal such as railroad tracks and steel reinforced concrete pavement. Other features, however, are identified which are anomalous and cannot be correlated to known or suspect utilities or other metal structures. Such anomalies indicate buried metal debris or above-background conductive areas. The EM61 survey also identified surface features (railroad tracks, concrete rebar) and several areas with buried metal debris. The EM34 survey indicates minor changes in the 20 to 50 foot conductivity regime, suggesting little or no probability of deeper conductive plumes.

In an attempt to identify and delineate the more significant anomalous areas, the EM61 data were compared to the EM31 data. The areas that are anomalous in both data sets are located on Figure 2 and labeled A1 through A9. These anomalies identify 9 zones within the North 40 site which have the highest probability of containing drum-sized metallic debris. Approximately 42 smaller anomalies were also identified, however these are related to zones having a lesser probability of containing large metallic debris, based on the intensity of the EM61 anomalies.

1.3.2 Recommendations

Based on results of the geophysical investigations, 9 anomalous areas (A1 through A9) have been identified as the most likely to contain drum-size metallic debris. These areas shall be excavated to determine the type of material buried and to remove potential contamination sources. The anomaly does not imply the presence of drums or contaminants, only the presence of drum-size metal objects. It is conceivable that the buried debris may consist of building debris with rebar, old railroad tracks, or a variety of other metallic rubble. Five of the 42 smaller anomalies were selected by geophysical intensity and shall be excavated to determine the cause of the anomaly. The five selected anomalies are B-5, B-11, B-12, B-28, and B-30. It is unlikely that these isolated anomalies are related to single buried drums, but more to metal rubble. If no drums are encountered, further excavation will not be performed. If drums are encountered in the smaller anomalies, notifications will be made as described in section 3.3.1. After notifications are made, the Navy, the MPCA staff and the USEPA shall review the information gathered in the field and determine how to proceed with investigation of the remaining small anomalies.

2.0
REGULATORY FRAMEWORK

The scheduled activities at the North 40 are removal actions conducted pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The Department of Defense is designated the lead agency for CERCLA activities under Executive Order 12580, dated January 23, 1987. The Department of the Navy formalized its policies regarding CERCLA activities in the *Navy/Marine Corps*

Installation Restoration Manual (IR Manual), February 1992. The IR Manual indicates that the following activities must occur:

- [illegible] local officials of the planned [illegible]

  - SouthDiv must notify USEPA Region V and Minnesota Pollution Control Agency (MPCA) of the planned removal action.

  - SouthDiv will provide NAVSEA a copy of the work plan.

  ~~Officer/General for review and signature~~.

- SouthDiv will prepare and the installation will publish a notice of availability of the administrative record file in a major local paper within 60 days of initiation of the removal action. SouthDiv must provide at least a 30-day public comment period on the removal action that is underway or that has been completed. The public comment period must start within 60 days of initiation of the removal action.

- SouthDiv will prepare written responses to significant comments for inclusion in the administrative record file.

- If the emergency removal action is expected to extend beyond 120 days from the initiation of the on-site removal action, SouthDiv must ensure that a formal Community Relations Plan (CRP) is in effect.

Since this is a CERCLA action being carried out entirely on site, no environmental permits from federal, state or local agencies are required. However, activities conducted entirely on site must conform with the applicable regulations and activities conducted off site (*i.e.*, waste disposal) must comply with all regulations. Applicable regulations governing activities occurring under the removal action include:

- 40 CFR Part 261 - *Hazardous Waste Identification and Listing* - The federal regulations defining hazardous wastes.

- 40 CFR Part 262 - *Standards Applicable to Generators of Hazardous Waste* - The federal regulations governing the management of hazardous wastes by facilities that generate hazardous wastes, but conduct no long-term treatment, storage or disposal of the hazardous wastes at the facility.

- 40 CFR Part 263 - *Standards Applicable to Transporters of Hazardous Waste* - Federal regulations governing transport of hazardous wastes. These regulations must be read in conjunction with U.S. Department of Transportation standards found in Title 49 of the Code of Federal Regulations.

- 40 CFR Part 268 - *Land Disposal Restrictions* - Federal regulations prohibiting land disposal of hazardous wastes prior to treatment by the methods or to the standards specified within the regulation.

- 49 CFR Part 172 - *Hazardous Materials Tables, Hazardous Materials Communications Requirements and Emergency Response Information Requirements* - Federal regulation for preparing hazardous materials, including hazardous wastes, for shipment. Used by generators to determine proper labelling, manifesting and placarding of hazardous wastes for transport to an off-site treatment or disposal facility.

- 49 CFR Part 173 - *Shippers - General Requirements for Shipments and Packaging* - Federal regulations defining the hazard classes and specifying packaging requirements for each hazard class.

- 49 CFR Part 178 - *Specifications for Packaging* - Federal specifications for containers used in shipping hazardous materials and hazardous wastes.

- 29 CFR Part 1910.120 - *Hazardous Waste Operations and Emergency Response* - Federal regulations setting forth training standards and work practices that are protective of worker health for hazardous waste site employees.

- 29 CFR Part 1926 - *Safety and Health Regulations for Construction* - Federal standards protective of worker health for general construction work activities.

- Minnesota Regulations Chapter 7045 - *Hazardous Waste* - State regulations governing the generation and management of hazardous wastes. Minnesota regulations are similar to the federal regulations found at 40 CFR Part 260 through 268, however Minnesota also regulates a class of hazardous waste (lethal waste) not recognized by the federal regulations.

- Minnesota Regulations Chapter 7035 - *Solid Waste* - State regulations governing the management and disposal of non-hazardous solid wastes.

Details on sampling and analytical procedures and proper processing of wastes generated that follow these regulations are presented in the CDAP in Appendix C and the Waste Management Plan in Section 8.0

3.0
WORK APPROACH

3.1 INTRODUCTION

The removal actions at the North 40 will be performed using an observational approach based upon the results of the geophysical investigation conducted in July 1995 (Geosphere Midwest, Inc. 1995). The principal feature of the observational approach is its explicit recognition of uncertainty and the ability to deal with the uncertainty in a systematic manner to reduce risk, project time and costs. The main advantage of this approach is that it allows interim removal actions to proceed based on current knowledge of site conditions without the need to collect additional site data and perform detailed design. However, the observational approach will require:

- This work plan, detailing the removal action based on most probable site conditions;
- Identification of parameters to be observed during removal actions; and
- Plans to deal with potential deviations.

The main uncertainty at the 51 North 40 sites is the nature and quantity of materials located beneath the ground surface in each of the 9 anomalous areas. Preliminary information on the extent of buried debris or drums is available from the Geophysical Investigation Report (Geosphere Midwest, Inc. 1995), included as Appendix D. Guidance has been sought by MK and provided by SouthDiv as to how many drums (50) and how many cubic yards of contaminated soils (100) to be removed. These numbers have been used for preparation of this Work Plan.

3.2 CONTROL OF WORK - THREE PHASES OF CONTROL (3PC)

The three phases of control system (3PC) is the control mechanism used to ensure each definable feature of work is performed according to the work plan and applicable specifications and regulations. MK will keep the NIROP Fridley Resident Engineer in Charge of Construction (REICC) appraised of all actions being taken regarding the three phases of control and will invite the REICC to all inspections.

For each particular excavation area, 3PC will be used on each definable feature of work. Definable features of work are the individual work activities associated with the work scope (e.g., site clearing, excavation, drum handling, etc.). The three phases in 3PC are: (i) the preparatory phase; (ii) the initial phase; and (iii) the follow up phase. These phases, and their associated inspections, identify "hold points" or check points, to allow evaluation of the work progress and to ensure quality requirements are being met.

3.3 NOTIFICATIONS AND REPORTS

3.3.1 Notifications

By MK

Local, state and federal agencies will be notified of the removal action prior to commencing on-site work activities specified.

Notifications include, at a minimum the following:

- The Navy shall provide public notification published in a local newspaper 60 days prior to commencement of the removal action with a 30 day public comment period.

- The Navy shall inform the Minnesota Pollution Control Agency (MPCA) of the work schedule two weeks before it is to start so that there is sufficient time to schedule on-site inspection of the excavation work.
- Notification to the USEPA Region 5 Office in Chicago, Illinois of a start date for this Emergency Removal Action under CERCLA guidance as defined in Executive Order 12580, dated January 23, 1987.

- The Navy shall notify the MPCA if drums are encountered during the excavation of the five smaller anomalies.

Any emergency notification required in case of fire, explosion or spills which may occur during activities described in this work plan, will be performed according to the Emergency Response Plan, as described in Section 12 of the Site Safety and Health Plan (SSHP).

3.3.2 Reports

A Removal Action Completion Report will be prepared after completion of the ~~interim~~ removal action. The daily combined Contractor production report/Contractor quality control report will be maintained and submitted as required by the Navy. In addition, reports are required by Site Safety and Health Plan (SSHP) and Quality Control Plan (QCP). These reports are addressed in detail in the SSHP and the QCP, found in Appendices A and B, respectively.

The Removal Action Completion Report will include,

- Construction activities including:
  - a photographic log of each excavation.
  - a log and description of all removed objects.
- Discrepancies from the work plan;
- As-built drawings; ~~what will they include~~ ?
- Sampling locations;
- Results of laboratory analyses; and
- Confirmation forms for transport and disposal.

3.4 DEFINABLE FEATURES OF WORK FOR NORTH 40 INTERIM ACTION

As described in Section 3.2, MK will use definable features of work and the three phases of control to oversee the work at the site. The definable features of work, listed below and described in the following sections, are the basic elements associated with the removal action in the North 40:

- Site Preparatory Work;
- Delineation of Depths of Excavation; and Excavation of Electromagnetic Anomaly Areas.
- Drum Handling and Staging;
- Drum Contents Sampling, Characterization and Disposition;
- Backfill Placement; and
- Site Restoration.

3.4.1 Site Preparatory Work

Site preparatory work is the first physical activity at the site and involves the mobilization and staging of equipment, demarcation of work zones, screening the site for underground utilities and removal of Government property.

A visual site inspection and evaluation of environmental conditions will be performed prior to mobilization. Any discrepancy between the site inspection and environmental conditions described in this Work Plan will be documented. Photographs of the site will be taken before, during and after the removal action.

All equipment mobilized to the site will be clean and inspected prior to shipment to the site. Upon arrival at the site, all equipment will be inspected by MK for general condition, to assure that all safety systems and alarms are functional and tested as necessary to assure it is capable of performing the required tasks. Personal protective equipment (PPE) will be inspected to ensure that they are in satisfactory condition and suitable for the intended use.

3.4.1.1 <u>Delineate Locations and Aerial Extent of Anomalies</u>

The location of each anomaly to be investigated will be marked in the ground with flags and/or marking paint. The anomaly map found in Figure 2 will be used to physically locate each area. The grid used during the geophysical survey described in Section 1.3 is still marked at the site. The map and existing grid will be used by field personnel to delineate and physically mark each area.

3.4.1.2 Subsurface Utilities Screening

Prior to excavating at the site, the Facilities Maintenance Department will be notified of the areas of planned excavation. Where located, utilities will be marked with stakes or flags noting the utility line and type.

In accordance with contract requirements (Section C, paragraph 2.18.1), the location and elevations of existing piping, utilities and any type of underground obstruction not indicated or specified to remove, but indicated in locations to be excavated, will be verified. The project site has been scanned with electromagnetic or sonic equipment and the surface of the ground will be marked where existing underground utilities are discovered. The location of the buried drums will also be staked following the non-intrusive survey.

3.4.1.3 Establish Control Zones

As specified in the Site Safety and Health Plan, the work zones and access routes within the North 40 will be established. The configuration of the work zones will be defined, including the boundaries of the Exclusion Zone (EZ), the Contamination Reduction Zone (CRZ) with appropriate decontamination stations, the Support Zone (SZ), and access routes. Signs, barricades and tapes will be placed to limit access.

Storm water and erosion control measures shall be implemented as necessary to control run-on, run-off and to prevent erosion. Storm water and erosion control measures are further described in the Environmental Protection Plan in Section 9.

Surveying will be performed during removal action to provide:

- Topographic map with excavation contours; and
- Determine volumes of material excavated.

Asbuilts?

Surveying will also be performed after the removal action to provide an as-built contour map.

3.4.1.4 Construct Decontamination Facilities

Prior to beginning work activities in conjunction with the removal action, decontamination facilities will be constructed as described in Section 7. Decontamination facilities will be constructed at or near each affected area within the North 40 as well as at a centrally located facility, as determined by field personnel.

~~If this practice is determined to be inefficient, multiple decontamination facilities will be constructed for use during removal activities at one or more of the affected areas in the North 40.~~

3.4.2 Delineate Depth and Perform Excavations

A digging permit will be obtained after confirmation from the Site Safety and Health Officer (SSHO) prior to excavation. The soil in the anomaly area will be carefully excavated with a backhoe or trackhoe to a maximum depth of 10 feet or until obstructions are excavated or ground water is encountered. Metal detectors will also be used to scan each excavation following drum or debris removal to determine whether there is a possibility of buried and other debris. Each layer of soil will be removed and stockpiled. The process of careful probing by excavation will continue until the probing and metal detection techniques show that drums and other debris have been encountered. If drums are detected, the soil around the drum will be excavated to expose the drum sufficiently for proper inspection and removal. Visually impacted soil will also be excavated and staged with the drums.

Excavated soil will be temporarily stockpiled on a 6 mil polyethylene liner surrounded by strawbale berms. A stockpiling plan will be developed for each area, detailing planned locations for individual stockpiles and protective measures that will be used for protection of human health and the environment. Stockpile sampling will be as agreed to by MPCA and Navy for unanticipated conditions for apparently impacted soils. Any water entering the area of the excavation will be collected, containerized, characterized and either transported off site for disposal or discharged to the sanitary sewer.

Subsurface removal of drums and debris shall require special precautions and safety considerations as detailed in the SSHP. Subsurface drum and soil removal will be conducted as described in Section 3.4.3.

3.4.3 Drum Handling and Staging

Due to the inherent risks associated with excavating and handling drums with unknown contents, the entire drum excavation and management process must be carefully planned. Figure 3 is a flow diagram of the basic process which must be followed when handling drums with unknown contents. All drums will be handled, to the extent possible, with remote handling equipment. Such equipment includes a drum grappler attached to a hydraulic excavator, a front-end loader equipped with a bucket sling, a rough terrain forklift, a roller conveyor or drum carts. An excavator will be used to remove soil from above and around the buried drums. Workers equipped with proper personal protective equipment will then inspect the drums that are uncovered to determine if they can be removed by mechanical means.

If a drum shows potential internal pressure, evidenced by bulging, the work around that drum will proceed with extreme care. Movement of a pressurized drum will be performed with the use of a drum grappler or similar unit equipped for safe containment. The bulged drum will be moved only as far as necessary to allow seating on firm ground. The bulging drum will be placed in secondary containment and

transferred to the temporary staging area. The drum will then be vented using a

If a drum shows potential internal pressure, evidenced by bulging, the work around that drum will proceed with extreme care. Movement of a pressurized drum will be performed with the use of a drum grappler or similar unit equipped for safe containment. The bulged drum will be moved only as far as necessary to allow seating on firm ground. The bulging drum will be placed in secondary containment and transferred to the temporary staging area. The drum will then be vented using a mechanical drum punch to relieve pressure. The SSHO and/or Project Manager will supervise this operation. All drums will be accumulated in accordance with Minnesota Hazardous Waste Regulation Part 7045.0292; staged in a bermed storage area. If, during drum removal, a drum breaks or otherwise leaks its contents before it can be overpacked, every effort will be made to recover any spilled material or soil that may become contaminated as a result of the release. This material or soil shall be sampled and handled according to paragraph 2, Section 3.4.2. Notification of this spill will be in accordance with Section 3.3 Notifications.

placed on a spill pallet prior to

3.4.4 Drum Contents Sampling, Characterization and Disposition

Care will be exercised when opening drums. The contents of all drums containing unknown liquids or solids will be considered hazardous waste until confirmatory samples are taken. Drums which contain less than three percent by weight or less than one inch of material are empty under Minnesota Regulations Part 7045.0127 and any remaining contents are not considered hazardous waste.

Hazardous waste shall not be stored or accumulated on site for a period greater than 90 days without a hazardous waste permit. The waste may be stored for a period up to 90 days provided that it is in compliance with Part 7045.0292 of the Minnesota regulations and 40 CFR 262.34. The 90 day clock begins to run once the drum is excavated. All hazardous waste shall be managed as described in Section 8.0 Waste Management Plan.

Temporary storage areas adjacent to each excavation shall meet the standards of Part 7045.0292 and be large enough to store all of the removed containers. The containers should be stacked one high with sufficient aisle space to allow access by sampling personnel between rows and containers. Each storage area must have an impervious base with side containment walls. The volume contained within the walls should be sufficient to contain 10% of the volume of the containers or the volume of the largest container, whichever is greater. The walls must be joined to the base and sealed to prevent any releases from migrating between the base and the walls.

Each of the drums will then be sampled and tested to determine their contents so that proper disposition of each can be identified. This sampling and testing will be conducted in each of the temporary staging areas. Once tested, the drums will then be moved to a main staging area and segregated into the following groups:

- Hazardous Liquids

- Hazardous Solids

- Non-hazardous Liquids

- Non-hazardous Solids

Further segregation and consolidation will be accomplished on the basis of additional waste characterization testing. Disposition of the wastes will be performed in a manner that proves most cost effective to the Navy and still meets all regulatory requirements.

Field personnel will characterize each drum visually and with the following screening procedure:

- Screen drum with a Combustible Gas Indicator (CGI) and a Photoionization Detector (PID);

- Collect a sample from the drum and place into a 100 ml container. Collect liquid samples with disposable glass thieves and solid samples with decontaminated stainless-steel spoons;

- Submit sample to laboratory for hazardous category (HazCat) parameters analyses including pH, oxidizer capacity, general chloride concentration, percent water, general appearance and compatibility studies are tested on each liquid sample;

- Complete the form shown in Figure 4 and group drums based on similar HazCat results;

- Collect individual samples from each drum or combine compatible wastes to form a bulk waste and collect a sample from the bulk waste for disposal characterization;

- Submit sample to laboratory for waste characterization analysis;

- Profile drum contents for disposal based upon analytical results.

Personnel involved in handling and transporting of drummed waste will work in teams containing no fewer than two people. Visual contact will be maintained between members of the working team at all times. All team members will be able to communicate between themselves and with the on-site SSHO at all times on the work site. Removal of drum bung or ring tops will be performed with non-sparking tools. Sample access ports may also be made using a non-sparking punch attached to a backhoe or other similar mechanical equipment. Drummed waste will be characterized in accordance with Appendix C, the CDAP.

3.4.5 Transport and Disposal of Wastes

Once the full drum inventory of the project is accomplished based upon completion of all excavation of drums, a determination of disposition of wastes will be developed.

Since there is uncertainty concerning the quality and quantity of drums that will be removed, it is not feasible to be more definitive about disposition. The following practices will be used:

- If practical, drummed liquid wastes will be pumped into a bulk tanker for shipment off-site for treatment and/or disposal.
- Empty drums will be crushed and shipped off-site for disposal at a landfill licensed to dispose of these drums.
- If bulking of liquids and/or solids is not practical, the drummed liquids and/or solids will be prepared for shipment in approved DOT containers, properly labeled and shipped off-site for treatment and/or disposal.
- If practical, drummed solid wastes will be open and dumped into rolloffs for shipment off-site for treatment and/or disposal.
- All packaging, manifests and shipping papers, use of licensed transporters and disposal facilities, waste characterization, and verification of delivery, treatment, and/or disposal will be accomplished in accordance with the requirements detailed in Section 8.0 - Waste Management.

3.4.6 Backfill Placement

All excavations shall be surveyed to record the extent of the excavation and backfill requirements. Each excavation will be backfilled to grade after samples have been collected from the bottom of each excavation . The excavations will be backfilled after permission is received from the Navy. If additional backfill is necessary, clean backfill will be obtained from an off-site borrow source. Backfill shall be placed in 2 foot lifts and compacted to 85 % compaction.

The backfill will meet the following requirements:

- Less than three inches in diameter
- pH 5.5 to 8.5
- Less than 25% organic material

In areas of underground utilities, the backfill compaction will be 95% within 5 feet of the obstruction and 90% within 10 feet.

3.4.7 Site Restoration

All roads, ditches, culverts and walkways shall be restored. Once all contaminated materials are containerized, the remaining equipment will be decontaminated and moved from the EZ to the SZ. The decontamination equipment will then be cleaned and the work zone barriers removed. ~~All decontamination fluids shall be collected and~~

All decontamination fluids shall be collected and sampled according to the CDAP. Water which meets the criteria shown on Table C-6 in the CDAP shall be discharged to the sanitary sewer. Water with chemicals exceeding the criteria on Table C-6 will be disposed off-site.

4.0
PERMITS

4.1 CONSTRUCTION PERMITS

No federal or state construction permits are required. Local disposal permits may be required. An excavation permit as specified in the SSHP will be required for any of the work at the North 40. Specific trenching, drilling and digging locations need to be provided to the NIROP Fridley Facilities Maintenance Department to obtain the necessary utility clearances. An excavation permit application will be submitted during Site Preparatory Work definable feature of work. Hot work permits will be issued on an as needed basis at each site.

The activity of personnel entering the excavations to expose and remove drums may be considered confined space entry as specified in the SSHP. All clearances, sign-offs and permitting required for confined space entry will be obtained.

4.2 ENVIRONMENTAL PERMITS

Pursuant to CERCLA Section 121, no environmental permits will be required for activities conducted solely on site. Waste disposal, which will occur off site, will be conducted in accordance with federal, state and local regulations; however, no permits will be required by NIROP Fridley for off-site waste disposal.

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~~what does the mean~~ ?

5.0
QUALITY CONTROL

5.1 Introduction

As the prime contractor, MK implements and retains full authority for the Quality Control Program. All matters involving Quality Control performed in the execution of SouthDiv Environmental Remedial Action Contractor (ERAC) Delivery Orders are managed by MK. This approach provides the Navy with a quality management system that has clear lines of authority and responsibility with a consistent approach and application of quality requirements.

The QCP, included as Appendix B and bound under a separate cover, identifies Quality testing and inspection requirements for the scope of work to be performed. At the heart of the QCP is the Testing Plan and Log, which lists required tests and inspections for each definable feature of work. The Site QC Supervisor ensures that all tests and inspections are performed to the standards specified and at the required frequencies. Results of these tests and inspections are documented on the Testing Plan and Log. The Program QC Manager is the primary point of contact with the Navy Contracting Officer for quality matters, and is based in the MK Program Management Office in North Charleston, SC.

The Site QC Supervisor is responsible for implementing the Three Phases of Control during construction activities to ensure that work complies with contract requirements. The Three Phases of Control are performed to fully and adequately encompass both on-site and off-site work. The Three Phases of Control are performed for each definable feature of work delineated in the project-specific QC Plan. The Three Phases of Control consist of a Preparatory Phase, Initial Phase and Follow-up Phase, described briefly below and detailed in the project QCP.

5.2 Preparatory Phase

The Contracting Officer shall be notified at least two working days in advance of each preparatory phase. The preparatory phase is conducted with the superintendent and the foreman responsible for the definable feature of work. Results of the preparatory phase actions are documented in the daily Contractor quality control report. The following activities are performed prior to beginning on each definable work feature:

- Review each paragraph of the applicable specification sections;
- Review the testing plan and ensure that provisions have been made to provide the required QC testing;
- Examine the work area to ensure that the required preliminary work has been completed;

- Review the Safety Plan and appropriate activity hazard analysis to ensure that applicable safety requirements are met, and that required material safety data sheets (MSDS) are submitted; and,

- Discuss construction methods.

5.3 Initial Phase

The Contracting Officer shall be notified at least two working days in advance of each initial phase. When crews are ready to start work on a definable feature of work, the initial phase is conducted with the personnel responsible for that definable feature of work to ensure that the work complies with contract requirements. The results of the initial phase are documented in the daily contractor quality control report. The initial phase is repeated for each new crew to work on-site, or when acceptable levels of specified quality are not being met. The following is performed for each definable feature of work:

- Establish the quality of workmanship required;

- Resolve conflicts;

- Review the Safety Plan and the appropriate activity hazard analysis to ensure that applicable safety requirements are met; and

- Ensure that testing is performed.

5.4 Follow-up Phase

The following is performed daily as the follow-up phase for on-going work, or more frequently as necessary until the completion of each definable feature of work. The results of the follow-up phase are documented in the daily Contractor quality control report:

- Ensure the work is in compliance with contract requirements;

- Maintain the quality of workmanship required;

- Ensure that testing is performed; and,

- Ensure that rework items are being corrected.

QC consists of a system of checks on field sampling and laboratory analysis (through the use of field blanks, duplicates, documentation of all sample movement, chain of custody records, etc.) to provide supporting information on the methods employed to ensure quality analytical data.

6.0
SAFETY AND HEALTH

The Site Safety and Health Plan (SSHP) describes safety and health requirements for the removal activities. The SSHP is consistent with requirements of the Occupational Safety and Health Administration's (OSHA) Hazardous Waste Site Regulations, 29 CFR 1910.120 and 29 CFR 1926.65 along with the U.S. Army Corps of Engineers' *Safety and Health Requirements Manual* EM 385-1-1 dated October 1992.

The SSHP is applicable to all personnel who enter into work areas described in this SSHP and which are under MK or MK's subcontractors' control.

The SSHP is bound under separate cover and constitutes Appendix A of this work plan. The SSHP is intended to cover all aspects of this work plan. Each task has an Activity Hazards Analysis. If a new task is identified, an Activity Hazards Analysis will be performed prior to beginning work on the new task.

7.0
DECONTAMINATION ACTIVITIES

7.1 MINIMIZATION OF CONTAMINATION

During site activities, all personnel shall minimize contact with contaminated materials. Entrance to the exclusion zones will be limited to personnel trained in accordance with 29 CFR 1910.120. All personnel leaving the exclusion zone will pass through a decontamination zone and follow personnel decontamination procedures as specified in the SSHP.

7.2 DECONTAMINATION FACILITY

The location and number of decontamination facilities will be determined by field personnel. Decontamination facilities may be utilized by multiple excavation sites as determined by field personnel. Material used to construct the decontamination facilities that is in good condition may be moved and reused at subsequent sites. The facility will consist of a high density polyethylene (HDPE) liner draped over sandbags and sloped to a sump or collection area. A single sheet of HDPE will cover the base of the decontamination facility. The liner will be visually inspected prior to use, on a daily basis, to detect possible failures of the liner material. This liner will be inspected:

- for evidence of tears and holes;
- for evidence of seepage;
- to ensure that the sheeting is adequately fastened to the side walls;
- to ensure that the liner adequately covers the sand bags at the end sections; and
- to ensure that generated liquids can be contained until collected for disposal.

If damage is detected, the liner will be repaired or replaced before further use. Records will be maintained specifying decontamination facility construction materials and methods, disposition of liquids, and any repairs and/or breaches of liner integrity.

When the decontamination facility is not in use, it will be covered to minimize accumulation of rainwater.

When the decontamination facility is dismantled, the underlying material will be visually inspected. Visibly contaminated material will be removed and managed as a contaminated waste. [illegible] At the decontamination facility, exposed surfaces of construction and field equipment will be decontaminated using a solution of high-pressure/low-volume water or steam with detergent. The equipment will be visually inspected for signs of contamination and screened for organic vapors with a PID. If elevated levels (greater than environmental background) are measured, the decontamination procedure will be repeated. Pumping equipment and associated hoses (including vacuum truck hoses) will be flushed with water and detergent followed by a water rinse.

7.2.2 Sampling Equipment Decontamination Procedures

Sampling equipment decontamination procedures are provided and detailed in Appendix C, CDAP.

8.0 WASTE MANAGEMENT

Waste management, including disposal functions, will be conducted in accordance with this Waste Management Plan. Waste streams expected to be generated during this project will include:

- Buried drums and their contents;
- Impacted soil exceeding backfill criteria;
- General debris consisting of possibly concrete, wood or metal;
- Inert wastes (wood, HDPE, etc.)
- Decontamination and incidental water; and
- Personal protective equipment, clothing and discarded sample equipment.

8.1 INTRODUCTION

This plan describes methods to manage and dispose the various waste streams generated during the life of this project as executed at the NIROP Fridley, Minnesota facility. All waste shall be collected and stored on site in appropriate containers or piles, characterized, and disposed of according to federal, state and local regulations described in the ensuing sections.

MK is responsible for:

- ensuring that all waste streams are managed in accordance with the procedures in this plan;
- providing field oversight and ensuring subcontractor compliance with the procedures in this plan;
- ensuring that appropriate waste containers and secondary containment are provided,
- preparing for NIROP Fridley authorized signature all required paperwork and documentation, including manifests, for all wastes generated during the removal activities within the designated notification time;
- ensuring all waste containers are properly managed in accordance with state and federal laws and regulations;
- maintaining waste records for the field effort; and
- preparing Closure Reports, if necessary.

8.2 NORTH 40 REMOVAL ACTION

The NIROP Fridley North 40 is located approximately 1,000 feet east of the Mississippi River. A geophysical survey indicated that 51 potential drum burial sites exist, all of which were probably unlined. The following material may be disposed of in the drums;

ORNAMENTS

- Waste oil and solvents generated during the manufacturing of ~~munitions~~ and maintenance of the facility.

The scope of work for North 40 removal action includes:

- Excavation of disposed drums,
- Sampling of drums and laboratory analyses, and
- Transportation and disposal of excavated drums,
- Backfilling and restoration of the excavated area.

8.3 RESPONSIBILITIES AND TRAINING REQUIREMENTS

8.3.1 Personnel Responsibilities

Hazardous Waste Disposal Coordinator: The hazardous waste disposal coordinator is responsible for arranging and coordinating the safe and proper completion of the tasks required for disposal of a hazardous waste as previously defined. These tasks include but are not limited to:

- insuring proper handling, packaging, and labeling of hazardous wastes; and
- coordinating all hazardous waste documentation, including all shipping papers and manifests, chain-of-custody, Land Disposal Restriction (LDR) forms and variances, sample and waste inventory tracking, etc.

Project Manager: The project manager's responsibilities include coordination of the project resources to assure compliance with the appropriate plans, procedures, and regulatory requirements for hazardous waste material handling, packaging, labeling, etc.

8.3.2 Training Requirements

Disposal Coordinator: The disposal coordinator performing the shipment shall be trained as described in the SSHP and as a minimum in accordance with the following criteria:

- 49 CFR Part 172.700 (Subpart H) - Hazmat Employee Training
- 29 CFR Part 1910.120 - OSHA 40 Hour Health and Safety Training

Field Personnel: All personnel performing any activity which may cause exposure to hazardous materials shall be trained as described in the Site Safety and Health Plan and as a minimum in accordance with the following criteria:

- 29 CFR part 1910.120 - OSHA 40 Hour Health and Safety Training

8.4 WASTE STREAMS

Waste streams expected to be generated during the life of the project include:

- produced ground water,
- general debris,
- decontamination water,
- disposable personnel protective equipment and clothing,
- inert wastes (wood, HDPE, etc.)
- drummed and bulked hazardous wastes, and
- sludges.

Work will be performed in such a way as to minimize the amount of solid waste generated by activities performed. Solid waste will be characterized as hazardous or non-hazardous as described in Section 8.5. Every effort shall be made to eliminate and minimize the generation of hazardous waste. This goal will be achieved by implementing remediation techniques, technologies, and approaches that yield the least amount, and the lowest concentration of hazardous waste. All potentially hazardous waste will be identified and classified per the requirements of RCRA, codified at 40 CFR 261. Hazardous waste shall be characterized and managed as described in Sections 8.5 and 8.6 of this Plan.

8.4.1 Produced Ground Water

Ground water encountered during excavation of the contaminated soil must be pumped from the excavation. Potentially contaminated produced ground water will be collected at each excavation site and sampled. Based on sample results, water will be discharged to the sanitary sewer or transported off site for ultimate disposition.

8.4.2 Debris

Preliminary screening of debris shall be performed throughout the excavation or remediation area. Preliminary screening shall consist of; visual inspection of the entire area; inventory of drums, containers, asphalt and concrete, bulk construction debris and other debris; screening sampling, if necessary; and sorting of debris. These items will then be removed and placed on plastic in a bermed storage area. Drums and containers will be visually inspected to check for leakage, buckling or excess corrosion. If the container is empty it can be placed in the storage area directly. All other drums will be placed in an overpack container prior to being placed in the storage area.

The following is the empty container exclusion 40 CFR 261.7: Any hazardous waste remaining in a liner of empty container is not regulated if all the waste has been removed by methods such as pumping or pouring. Additionally, no more than 2.5 centimeters or one inch of waste can remain in the bottom of the container, or less than 3 percent by weight if the container is under 110 gallons, less than 0.3 percent if over 110 gallons.

The debris encountered during the remediation activities shall be collected, sorted, and dispositioned as hazardous or non-hazardous waste and disposed of accordingly. All non-hazardous bulk construction debris dispositioned for off-site disposal in a Subtitle D landfill shall require sample analysis including the following:

- Full TCLP (Toxicity Characteristic Leachate Procedure) for solid waste
- Flash point
- pH
- Reactivity

All debris characterized as hazardous waste shall be managed as described in Sections 8.5 and 8.6 of this Plan.

8.4.3 Decontamination Water

8.4.3 Decontamination Water

Decontamination water is generated during steam cleaning or high-pressure wash of debris, excavation equipment and during manual decontamination of sampling equipment. Since the decontamination water is expected to contain low concentrations of the contaminants potentially found at the site, it will be collected and sampled. All water used in decontamination will be temporarily collected in 55-gallon drums at the point of generation. Decontamination water from all locations will be transferred to one 2,000-gallon tank for storage prior to disposal. Based on sample results, water will either be discharged to the sanitary sewer or transported off site for ultimate disposition.

8.4.4 Disposable Personnel Protective Equipment

Waste PPE includes disposable Tyvek® suits, gloves, boots, and visquene. The quantity of PPE generated depends upon the schedule and number of times PPE is discarded daily. Contaminated PPE will be placed in a plastic
lined 55-gallon drum immediately after use. Drums will be transported to a municipal landfill for ultimate disposal.

8.4.5 Spill Prevention and Control

If a spill or release of hazardous materials occurs in the work area, the Contracting Officer's representative will be notified. MK will meet with the Navy and NIROP

8.4.5 Spill Containment Plan

If a spill or release of hazardous materials occurs in the work area, the Contracting Officer's representative will be notified. If a spill occurs, the Spill Containment Plan, Section 16, of the SSHP, shall be followed. The SSHP (Appendix A of the Work Plan), contains a list of safety and spill control equipment available on site in the event of an emergency.

8.5 IDENTIFICATION AND LISTING OF HAZARDOUS WASTE

Under RCRA the following list includes wastes that are not considered a solid waste:

- Domestic sewage sludge
- Industrial waste water discharges regulated under the Clean Water Act (CWA)
- Irrigation return flows
- Nuclear material or byproducts

NOTE: This does not mean that the above waste is not regulated. However, they are not regulated under RCRA.

The following wastes are not considered hazardous waste in accordance with Subtitle C and D of 40 CFR 261.

- Polychlorinated Biphenyl (PCBs) containing Dielectric fluid (40 CFR 261.8)
- Asbestos
- Household wastes

40 CFR 261 specifies that a solid waste is hazardous if it is not excluded from regulation as a hazardous waste and it meets the following conditions: exhibits any of the characteristics of a hazardous waste; has been named as a hazardous waste and listed as such in regulations; is a mixture containing a listed waste and a non-hazardous solid waste; and is a waste derived from the treatment, storage or disposal of a listed waste.

Each listed hazardous waste has single letter indicator called a Hazard Code. A waste stream may have one or more of these codes. These single letter indicators are:

(I) For those wastes that are listed due to their ignite ability properties,
(C) For those wastes that are listed due to their corrosivity,
(R) For those wastes that are listed due to their reactivity;
(E) For those wastes that are listed because they contain levels of contamination over the Toxicity Characteristic levels;

(H) For those wastes that have been found to be acutely toxic; and
(T) For those waste that have been found to be toxic.

Use the flowcharts in Figures 5 and 6 to determine if a waste is hazardous and what codes apply during a source removal activity. This approach methodically evaluates the type of waste and if a waste code or group of codes may apply to a waste. It is mandatory that the reader continue through the entire flowchart from beginning to end. Skipping around may cause an incorrect identification of a waste stream.

8.5.1 Flowchart Process (Figures 5 and 6)

The "Is Source or Nature of Waste Known?" question refers to:

a) **Unused, off specification or primary active ingredient.**

- Determine whether or not waste is a commercial chemical product and if so, what kind. If not listed as a commercial chemical product follow the flowchart.

- If waste is listed as commercial chemical product and if the EPA has determined the material to be toxic or acutely toxic, the product will be listed in 40 CFR 261 on either the U or P tables (look at both). Example, the waste could be a drum of DDT.

b) **Non-Specific or Specific source determination**

- If the waste has been used, therefore not an unused, off-specification, or primary active ingredient, then determine if the waste was listed due to the process or industry the waste is generated from. If the answer is yes determine the F or K code from 40 CFR 261. Example, petroleum refining is an industry that is defined by the EPA as a specific industry.

c) **Exhibiting Characteristics**

- Does the waste exhibit one or more of the characteristics of Ignitability, Corrosivity, Reactivity, or Toxicity? If so, then the D codes apply.

Once you have determined all of the waste codes that apply, list them and you have a Federally regulated material. If no waste codes applied, then the waste is not Federally regulated waste under RCRA.

8.6 HAZARDOUS WASTE

8.6.1 Preparation

The following prerequisites shall be met prior to shipping Hazardous Materials by any conveyance on the public highway, by vessel or rail or by air.

- The material must be identified by the most appropriate Proper Shipping Name in accordance with the Hazardous Materials Tables of 49 CFR 172.

- If the material is a Hazardous or Mixed Waste, the material must be identified by the most appropriate USEPA Waste Code in accordance with 40 CFR 261.

- The generator, transporter, and disposer of Hazardous Waste shall have valid EPA Identification Numbers and all EPA Permits (Generator Permits, Transporter Permits, TSD Permits, etc.), as appropriate. The generator shall also provide evidence that the waste stream(s) being shipped is acceptable at the receiving facility in accordance with all permit requirements.

- The Generator of Hazardous Waste (or his representative) shall have completed all notifications and certifications for the waste material subject to the LDR in accordance with 40 CFR Part 268 and the latest rules, specifically Final Rule (FRL-5028-9) Land Disposal Restrictions Phase II-Universal Treatment Standards and Treatment Standards for Organic Toxicity Characteristic Wastes and newly Listed Wastes effective December 19, 1994. The following certification forms shall be prepared for Navy signature as applicable:

  - Notification From Generator to Treatment Facility That Wastes Do Not Meet Treatment Standards
  - Generator Notification and Certification To Treatment, Storage, and Disposal (TSD) Facility for Wastes Meeting The Treatment Standards
  - Generator Notification and Certification To TSD Facility for Restricted Wastes with Variances, Extensions, or Exemptions
  - Treatment Facility Notification To TSD Facility That Treated Waste Meets Treatment Standards.

- Hazardous Materials not shipped as waste shall be shipped in such a manner as to conform to all federal, state and local ordinances. The Customer offering the material for transport shall make available the Material Safety Data Sheets. Non-waste Radioactive Materials shall only be shipped to a facility upon provision of evidence, by the customer, that the material is acceptable at the receiving facility.

- Prior to shipment of waste to a hazardous or waste disposal facility, the receiving facility must be approved by MK and the Navy.

- The Disposal Coordinator shall complete the Manifest Signee Certification Checklist, provided in Attachment B, for each shipment of hazardous materials.

- The Disposal Coordinator shall obtain Manifest Numbers, Manifest and shipping documentation, and signatures from the Navy (the waste owner) for all hazardous waste shipments.

8.6.2 Storage and Control of Hazardous Waste

8.6.2.1 Containers

If a container holding hazardous waste is not in good condition per 49 CFR 173.24, or if it begins to leak, MK (or its representative) shall transfer the hazardous waste from the leaking container to a container that is in good condition or manage the waste in some other way.

The generator must use a container made of or lined with material which will not react with, and are otherwise compatible with, the hazardous waste to be stored, so that the ability of the container to contain the waste is not impaired.

The container holding hazardous waste must always be closed during storage, except when it is necessary to add or remove waste. A container holding hazardous waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak. The container holding hazardous waste must always display the proper marking and labeling per 49 CFR 172.

Incompatible wastes, or incompatible wastes and materials, must not be placed in the same container, unless the requirements of 40 CFR 265.17(b) are complied with.

Hazardous waste must not be placed in an unwashed container that previously held an incompatible waste or material unless the requirements of 40 CFR 265.17(b) are complied with.

8.6.2.2 Inspections

The waste generator is required to inspect the waste stored at the hazardous waste storage area on project sites on a weekly basis to the requirements of a RCRA temporary accumulation area (per 40 CFR 265.174). All accumulation, transfer, and storage areas will be identified in the site specific Work Zone Maps and designed and constructed in accordance with the requirements of 40 CFR 265. The wastes generated by MK on behalf of the customer are limited to a 90 day RCRA storage time for a temporary accumulation area (per 40 CFR 262.34).

8.6.2.3 Storage Area

Containers storing ignitable or reactive waste must be located at least 50 feet from the facility's property line.

A storage container holding a hazardous waste that is incompatible with any waste or other materials stored nearby in other containers, piles, open tanks, or surface impoundments must be separated from the other materials or protected from them by means of a dike, berm, wall, or other device.

All waste containers will be assigned an inventory number from the waste tracking log. Each container will be inventoried on a monthly basis. Waste will be stored on site for no more than 90 days.

8.7 TOOLS, MATERIALS, AND EQUIPMENT

Unless provided by the customer, the Hazardous Waste Disposal Coordinator will be required to provide all tools, administrative forms, survey instruments, labels, markings, and placards for each shipment of materials. Special care must be taken by the Disposal coordinator to ensure that an adequate supply of such materials is maintained. A Field Kit Materials List is provided as Attachment A of this procedure.

8.8 DETAILED INSTRUCTIONS

8.8.1 Procedure For Material Preparation

All hazardous materials or waste shipped by MK or its subcontractors shall be in strict adherence to the requirements of 49 CFR 170 through 180, Minnesota Regulations for hazardous waste management, and all other applicable federal, state, and local regulations.

1) Materials shall be packaged and the packaging inspected in accordance with the requirements of 49 CFR 173 for the Proper Shipping Name and USDOT Subtype of the material being offered for transport.

2) All packages offered for transport shall be properly marked and labeled in accordance with the requirements of 49 CFR 172 prior to shipment. Any old, worn, torn, or otherwise illegible labels and/or marks shall be replaced as soon as practical after they are discovered. Labels shall not be modified or corrected once they are affixed to drums.

3) Shipping Papers will be prepared for shipments as follows:

   - All hazardous materials (unless otherwise excepted) shall have USDOT hazardous materials shipping papers prepared in accordance with 49 CFR Parts 172.200 - 172.205.

   - All hazardous waste shall, in addition to USDOT hazardous materials shipping papers, shall have a Uniform Hazardous Waste Manifest selected and prepared in accordance with 49 CFR 262.20 or the appropriate state specific hazardous waste manifest form.

   - Additional forms shall be prepared as may be required by federal, state, and local ordinance, and by receiving site license or acceptance criteria.

8.8.2 Procedure For Material Loading

With the exception of common carrier shipments of hazardous materials, the following procedure shall be followed when loading material for transportation:

NOTE: Notify the NIROP Fridley Personnel for inspection and manifest signature prior to loading transport vehicle.

1) Conduct and document a visual inspection of the conveyance and ensure any discrepancies are repaired prior to loading.

2) If the vehicle floor shows evidence of moisture, the floor shall be wiped as dry as possible and the condition of the floor and action taken noted on the shipping papers. The consignee shall also be notified prior to shipment.

3) The Disposal Coordinator and the NIROP Fridley representative shall inspect all packages as they are loaded to ensure that the packages are in full compliance with all the requirements set forth in this procedure. Incompatible materials shall be segregated as required by 49 CFR.

NOTE: Special care shall be taken to ensure that all strong tight containers used for transport are completely sealed to the maximum extent practical. This includes the use of sealant on seams of metal boxes. <u>Special care shall also be taken to ensure that all specification packages are properly prepared for transport and in pristine condition prior to transport.</u> Contact the disposal coordinator or the project manager for all questionable packages.

4) Upon completion of loading, visually verify that all packages are loaded.

5) Verify the proper use of blocking, bracing, dunnage, and tie-down, as appropriate.

6) Verify the conveyance is properly placarded, as applicable.

7) Seal the vehicle/conveyance if required.

8) Obtain NIROP Fridley authorized representative signature on the waste shipping manifest.

8.8.3 Post Loading Requirements

1) Have the driver (or transporter's representative) and shipper (or shipper's agent) sign all required forms.

2) Review all paperwork to ensure legibility.

3) Copy and Distribute all paperwork. Uniform Hazardous Waste Manifests (Form 8700-22 and 87-22A if necessary) shall be distributed in accordance with 40 CFR 262 and the Minnesota Hazardous Waste Regulations as indicated in the Distribution Checklist provided as Attachment B.

4) Verify that the driver (transporter's representative) understands all special instructions such as the maintenance of exclusive use and prior notification requirements. The shipment may now be released for transport.

5) Notify the Project Manager of a shipment in progress.

8.9 RECORDS

8.9.1 Disposal Coordinator

The Disposal coordinator shall retain copies of records, forms, and shipping papers generated as a result of this procedure until written acknowledgment is received from the consignee for all waste shipments or telephone acknowledge is received for all non-waste shipments.

All facilities that ship for disposal/treatment more than 1000 kilograms of hazardous waste per month shall receive a signed copy of the disposal manifest from the TSD facility within 35 days after shipment of waste. If a copy of the signed manifest is not received a the shipper must contact the transporter or operator of the designated facility to determine the status of the waste.

If a copy of the manifest with the handwritten signature of the owner or operator of the designated facility within 45 days of the date the waste was accepted by the initial transporter an Exception Report to the EPA shall be initiated per 40 CFR 264.42(a)(2).

All facilities that ship for disposal/treatment more than 100 kilograms of hazardous waste per month but less than 1000 shall receive a signed copy of the disposal manifest from the TSD facility within 60 days of the date the waste was accepted by the initial transporter an Exception Report to the EPA shall be initiated per 40 CFR 264.42(b).

8.9.2 Project Records

All shipping papers shall be retained as part of a permanent project file for each project.

8.9.3 Generator

The generator of waste shall be provided with their copy of the shipping papers.

ATTACHMENT B
WASTE MANAGEMENT CHECKLISTS

COPY DISTRIBUTION CHECKLIST
HAZARDOUS WASTE

UHWM**	Disposal Site	Shipper	Carrier	Van Copy*	Pro. Mgr.	Disp. Coord.	Mail*
Land Ban (LDR) Certificate	original	original	original	copy	copy	copy	N/A
Bill of Lading	original	original	original	copy	copy	copy	N/A
Driver Instruction	copy	copy	original	copy	copy	copy	N/A
Inventory Sheet	N/A	copy	N/A	copy	copy	original	N/A
Admin. Info	N/A	N/A	N/A	N/A	copy	original	N/A
Coord. Checklist	N/A	N/A	N/A	N/A	copy	original	N/A
Emergency Action	copy	copy	original	copy	copy	copy	N/A

* ***IF APPLICABLE BY STATE AND LOCAL REGULATIONS***
** ***ADDITIONAL DISTRIBUTION AS REQUIRED BY STATE (FOLLOW FORM INSTRUCTIONS)***

ORIG - 1st Original
2 ORIG - 2nd Original
3 ORIG - 3rd Original
4 ORIG - 4th Original Procedure

NOTE: Items 1 through 16 and Items A through K correspond to Uniform Hazardous Waste Manifest Blocks with the same designations. Items A through K are optional on Federal and some State Forms.

RESPONSIBILITY/INITIALS

Before Pickup:

1.	_____	_____	YES	NO	Is the Federal Uniform Hazardous Waste Manifest being used? (Or the State form if the State has one)(More than one manifest may be required if the waste is transported through other States(s) having their own manifest).
	_____	_____	YES	NO	Has the generator's ID Number been identified?
	_____	_____	YES	NO	Has a Manifest Number been established by the generator?
2.	_____	_____	YES	NO	Is each page of the Manifest numbered?
3.	_____	_____	YES	NO	Has the name and address of the generator been used? (This should be the location which will manage the returned Manifest forms).
4.	_____	_____	YES	NO	Has the phone number of the generator been used? (This should again be the location which will manage the returned Manifest forms).
5.	_____	_____	YES	NO	Is the transporter's name on the Manifest?
6.	_____	_____	YES	NO	Is the transporter's EPA Id Number on the Manifest?
7.	_____	_____	YES	NO	If a second or alternate transporter has been arranged for, is this second/alternate transporter's name on the Manifest?
8.	_____	_____	YES	NO	Is the second or alternate transporter's EPA ID Number on the Manifest?
9.	_____	_____	YES	NO	Is the treatment/storage /disposal facility's (TSDF) name and address on the Manifest?
10.	_____	_____	YES	NO	Is the TSDF's EPA Id Number on the Manifest?
A.	_____	_____	YES	NO	Is the State Manifest Document Number reprinted on the Manifest?
B.	_____	_____	YES	NO	Is the generator's State ID Number on the Manifest?
C.	_____	_____	YES	NO	Is the Transporter's State ID Number on the Manifest?
D.	_____	_____	YES	NO	Is the transporter's phone number on the Manifest?
E.	_____	_____	YES	NO	If a second or alternate transporter has been arranged for, is this second/alternate transporter's State ID Number on the Manifest?
F.	_____	_____	YES	NO	Is the second/alternate transporter's phone number on the Manifest?
G.	_____	_____	YES	NO	Is the TSDF's State ID Number on the Manifest?
H.	_____	_____	YES	NO	Is the TSDF's phone number on the Manifest?

RESPONSIBILITY/INITIALS

Before Pickup:

11.	_____	_____	YES	NO	Does the Manifest include for each waste stream the Department of Transportation (DOT) proper Shipping Name, Hazard Class, ID Number, Packaging Group, and EPA Waste Codes? Does it also include "RQ" for wastes having CERCLA Reportable Quantities (RQ's)?
12.	_____	_____	YES	NO	Does the manifest include the number and type of container for each waste stream? (Abbreviations for container type are listed on the Manifest Instructions).
13.	_____	_____	YES	NO	For each waste stream, does the Manifest include a numerical quantity for that waste?
14.	_____	_____	YES	NO	For each waste stream, does the Manifest include the units associated with the quantity given above? (Abbreviations for units are listed on the Manifest Instructions).
I.	_____	_____	YES	NO	If that State issues one, does the Manifest include a State Waste Code Number for each waste stream?
J.	_____	_____	YES	NO	Are any additional descriptions for the waste streams included on the Manifest as necessary?
K.	_____	_____	YES	NO	Are handling codes for the waste streams included on the Manifest as necessary?
15.	_____	_____	YES	NO	Are special handling instructions and additional information (If Any) included on the Manifest?
16.	_____	_____	YES	NO	Has the generator's signee printed, signed and dated the generator's Certification Statement essentially attesting to the full and accurate manifest form completion, regulatory compliant preparation of waste for transport and to having a programming place to reduce the volume and toxicity of waste generated to the degree economically practicable, and to selecting the practicable method of the treatment storage or disposal which minimizes threat to human health and the environment.
17.	_____	_____	YES	NO	Has the hazmat employee (The manifest signee would qualify as such here) completed original and refresher DOT oriented courses required by DOT regulations? (OSHA 1910.120 training would suffice).
18.	_____	_____	YES	NO	Has the compliance status of the transporter and the TSDF been verified?
19.	_____	_____	YES	NO	Is there adequate 40 CFR 262.11 documentation of the waste's hazardous characteristics/listings (with hazardous constituent concentrations)?
20.	_____	_____	YES	NO	Have the appropriate Land Disposal Restriction (LDR) Notification/Certification forms been prepared and included with the Manifest? Does the form agree with the waste stream documentation?

RESPONSIBILITY/INITIALS

Before Pickup:

21.	_____	_____	YES	NO	Have wastes been packaged in accordance with Department of Transportation (DOT) requirements; placed in containers compatible with the waste and dated/identified/labeled RCRA?
22.	_____	_____	YES	NO	Are there hazardous Waste Profile Sheets for each of the wastes (IF required by the TSDF) in the format specified by the TSDF?
23.	_____	_____	YES	NO	Is all back-up information available for review? (Work Plans, Test Results, RCRA regs, DOT Regs, etc.)
24.	_____	_____	YES	NO	Is the generator's signee aware of what parties are involved with signing the Manifest and keeping copies?
25.	_____	_____	YES	NO	Is the TSDF permitted to accept your specific type waste(s)?
26.	_____	_____	YES	NO	Are emergency contacts and procedures in place to deal with an emergency in the event of one?
27.	_____	_____	YES	NO	Has the waste been staged at the agreed pick-up location?
28.	_____	_____	YES	NO	Does the generator's signee have on hand a letter which authorizes signature on the Manifest as the generator?

During Pick-Up:

29.	_____	_____	YES	NO	Is transport truck placarded per DOT requirements?
30.	_____	_____	YES	NO	Are Manifest signatures legible on all copies of the Manifest?
31.	_____	_____	YES	NO	Is the appropriate copy of the Manifest retained prior to letting the transporter leave the site?
32.	_____	_____	YES	NO	Is the generator's signee on-site (waste location) when signing the Manifest?
33.	_____	_____	YES	NO	Did the transporter sign the Manifest at the time of pick-up?

After Pick-UP:

34.	_____	_____	YES	NO	Is the generator's signee aware of the procedure for return of the Manifest copy to the generator? (Generator to start tracking if not returned in 35 days, exception reporting by day 45, etc.)

RCRA Compliance Issues:

35.	_____	_____	YES	NO	Is the generator status known? (Federal status could be large quantity [HW>1,000 KG/Month], small quantity [100 KG/month<QTY< 1,000/month], or conditionally exempt small quantity [QTY<100 KG/Month]; State definition may be different entirely)

RESPONSIBILITY/INITIALS

Before Pickup:

36.	_____	_____	YES	NO	Is the date of hazardous waste generation noted on the waste container/tank unless the waste is at a 55 gallon or less satellite accumulation area?
37.	_____	_____	YES	NO	Is the waste being managed in accordance with applicable regulations while on site? (RCRA regulations will be applicable in many cases).
38.	_____	_____	YES	NO	Are 40 CFR 265.16 training records (going back 3 years) available for personnel managing hazardous wastes at 90-Day Accumulation and Permitted Hazardous Waste Storage areas?
39.	_____	_____	YES	NO	Are record keeping requirements being satisfied? (Training, Manifest # tally, outstanding and returned manifests, LDR forms, Exception Reports. Disposal Certificates, HW generated Annual Reports). Is signee aware of the process by which each will be created and executed as well as the location of the records?

9.0
ENVIRONMENTAL PROTECTION

MK will employ measures during site work to ensure protection of the environment. All work will be performed in a manner which will minimize pollution of the air, water, and land at the site.

9.1 INTRODUCTIONN

This section describes the environmental protection measures MK proposes to use at NIROP Fridley. MK will perform all work in such a manner to minimize pollution of air, water and land. Within applicable regulatory requirements, noise and the disposal of solid waste materials and other pollutants will be controlled.

9.2 MEASURES FOR PROTECTING NATURAL RESOURCES

9.2.1 LAND PROTECTION

Except for any work or storage areas and access routes specifically assigned for MK's use under this contract, the land areas shall be preserved in their present condition. Trees and shrubs will not be removed, cut, defaced, injured or destroyed. The interim removal action should only minimally, if at all, require clearing and grubbing.

9.2.2 PROTECTION OF TREES

All trees which are to remain at the site that could be injured during operations will be protected by placing boards, planks or poles around them. No ropes, cables or guys will be attached or fastened to nearby trees for anchorage.

9.3 RESTORATION OF DAMAGED TREES

Any trees or landscape features which are scarred or damaged during system installation will be replaced with equivalent, undamaged trees and landscape features. The Contracting Officer's approval will be obtained prior to replacing trees.

9.4 PROTECTION OF WATER RESOURCES

Run-on/run-off controls will be used to prevent surface water contamination, as necessary. These controls include, but are not limited to, silt fences, hay bales, soil berms and dikes.

9.5 REMOVAL OF TEMPORARY CONSTRUCTION FACILITIES

Once an excavation is complete and the drums or debris is removed from the area, the removal action is complete, all temporary facilities will be removed. Any temporary roads constructed will be removed and vegetation restored.

9.6 PROTECTION OF FISH AND WILDLIFE RESOURCES

This work will not disturb fish or wildlife, alter water flows or otherwise significantly disturb the native habitat on or adjacent to the work site.

9.7 WETLAND PROTECTION

No wetland areas are anticipated to be disturbed while the interim measure is implemented.

9.8 HISTORICAL AND ARCHEOLOGICAL RESOURCES

Although no historical and archeological items or human skeletal remains are expected to be found, the Contracting Officers' representative will be notified immediately in the event any archeological items are encountered. Any items discovered will be carefully preserved and work stopped in the area until direction is received from the Contracting Officer to resume work.

9.9 DUST CONTROL

MK will maintain all excavations, stockpiles, access roads and other work ares free from excess dust to avoid causing a hazard. Dust control at the site is accomplished by wetting the soil or structure with a wetting water spray.

9.10 EROSION CONTROL

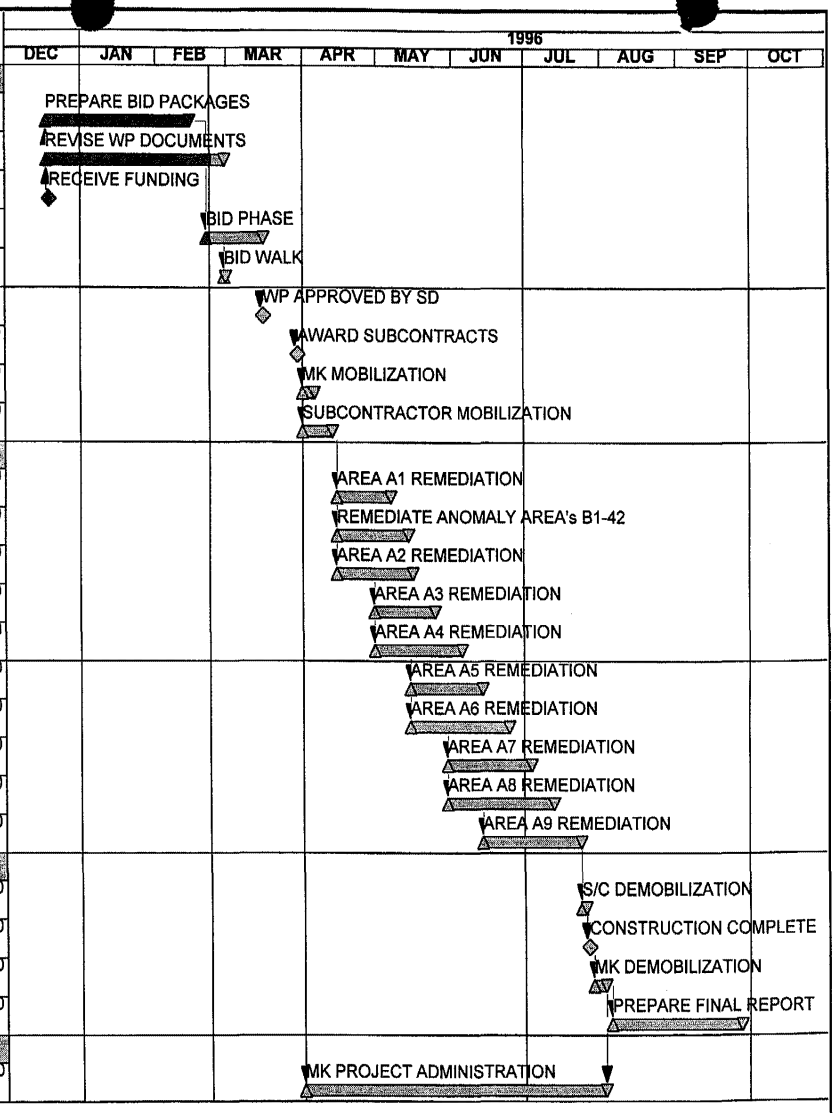
Temporary erosion control measures will be utilized in excavation areas until permanent surface drainage is reestablished. The amount of bare soil exposed at any one time will be minimized and the excavation will be secured when work is not in progress, before leaving the site each night.

10.0
SCHEDULE

A construction schedule for the project is shown in the following pages. Milestones for the project are as follows:

Mobilization	April, 1996
Construction Complete	July, 1996
Construction Completion Report	October, 1996

Activity description	Early start	Early finish	Rem Dur	%
MOBILIZATION				
PREPARE BID PACKAGES	18DEC95A	14FEB96A	0	100
REVISE WP DOCUMENTS	18DEC95A	28FEB96	4*	93
RECEIVE FUNDING		18DEC95A	0	100
BID PHASE	22FEB96A	15MAR96	16*	6
BID WALK	29FEB96	29FEB96	1	0
WP APPROVED BY SD		15MAR96*	0	0
AWARD SUBCONTRACTS		29MAR96*	0	0
MK MOBILIZATION	01APR96	05APR96	5	0
SUBCONTRACTOR MOBILIZATION	01APR96	12APR96	10	0
REMEDIATION ACTIVITY				
AREA A1 REMEDIATION	15APR96	06MAY96	16	0
REMEDIATE ANOMALY AREA's B1-42	15APR96	13MAY96	21	0
AREA A2 REMEDIATION	15APR96	15MAY96	23	0
AREA A3 REMEDIATION	30APR96	24MAY96	19	0
AREA A4 REMEDIATION	30APR96	04JUN96	26	0
AREA A5 REMEDIATION	15MAY96	13JUN96	22	0
AREA A6 REMEDIATION	15MAY96	24JUN96	29	0
AREA A7 REMEDIATION	30MAY96	03JUL96	25	0
AREA A8 REMEDIATION	30MAY96	12JUL96	32	0
AREA A9 REMEDIATION	14JUN96	23JUL96	28	0
DEMOBILIZATION				
S/C DEMOBILIZATION	24JUL96	25JUL96	2	0
CONSTRUCTION COMPLETE		26JUL96	0	0
MK DEMOBILIZATION	29JUL96	02AUG96	5	0
PREPARE FINAL REPORT	05AUG96	27SEP96	40	0
SITEWIDE				
MK PROJECT ADMINISTRATION	01APR96	02AUG96	90	0



Project Start	01MAR94
Project Finish	30APR97
Data Date	23FEB96
Plot Date	06MAR96

Early Bar
Progress Bar

(c) Primavera Systems, Inc.

4324

SOUTHDIV ERAC PROGRAM - WO #4324
NIROP FRIDLEY, MINNESOTA
DO#0014, SOW#015, PH 3 SCHEDULE

Sheet 1 of 1

MORRISON KNUDSEN CORPORATION

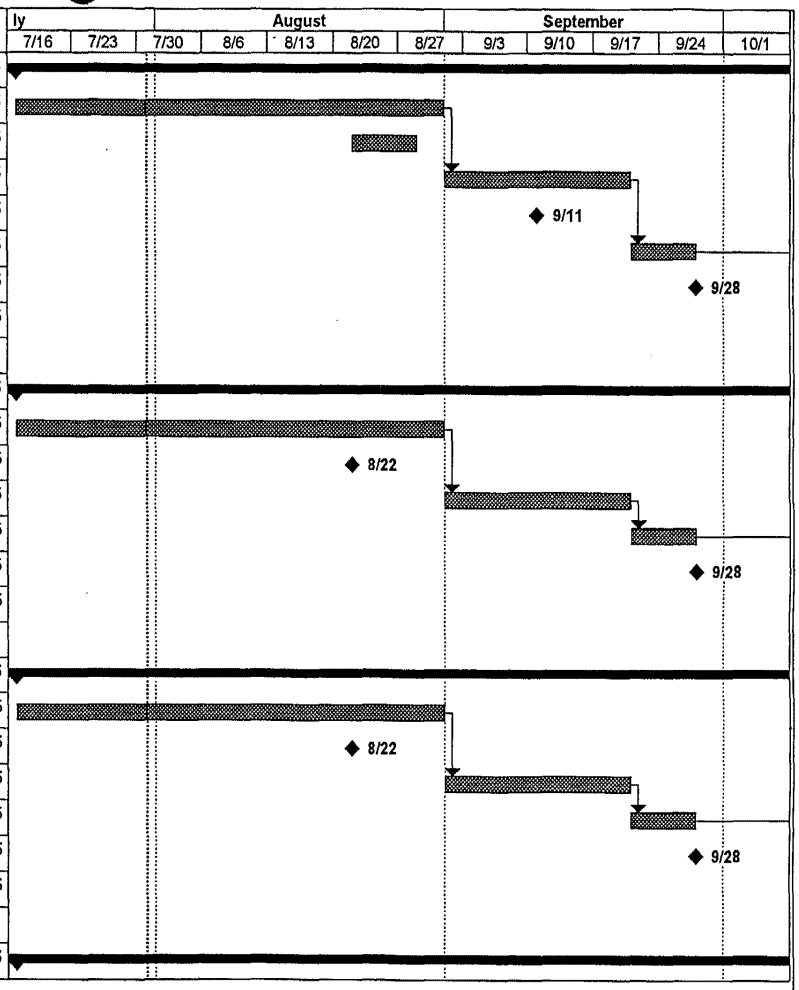
Date	Revision	Checked	Approved

11.0
SUBCONTRACT PLAN

S/C	Description	Type	SB	SDB
A	Excavation Work - Scope is to excavate drums from designated areas and transport to the drum sampling area, once drums sampled transport to final storage area. Backfill excavated areas and restore site to prework conditions. Dispose of all non-hazardous waste.	FP	YES	YES
B	Drum Sampling - Scope is to sample all drums of unknown contaminants, to include relieving pressure in bulging drums. Combine compatible material in drums for disposal. Laboratory Testing - Scope is for laboratory testing of liquid, sludge and solid material from excavated drums.	UP	YES	YES
C	Analytical Laboratory - Scope is to test soils from excavated sites.	UP	YES	YES
D	Waste Disposal - Scope is to dispose of excavated drums and all associated waste in the drums. Dispose of all secondary waste generated from excavation activities (i.e., PPE, decontamination material). Waste Transportation - Scope is to transport all hazardous waste generated to the approved disposal facility.	UP	YES	YES

SB is Small Business
SDB is Small Disadvantage Business
Type of Contract
FP is Firm Fixed Price
UP is Unit Price

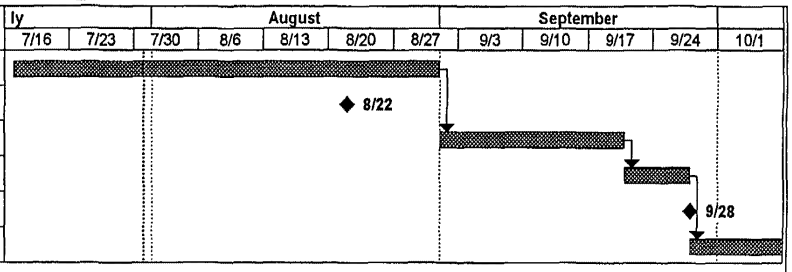
ID	Task Name	Duration	Start	Finish
1	**Excavation - Subcontract**	**112d**	**Mon 7/17/95**	**Tue 12/19/95**
2	Bid Preparation	34d	Mon 7/17/95	Thu 8/31/95
3	BID PKG to PMO	5d	Tue 8/22/95	Mon 8/28/95
4	Bid on Street	14d	Fri 9/1/95	Wed 9/20/95
5	BID Walk	0d	Mon 9/11/95	Mon 9/11/95
6	Bid Review/Award	5d	Thu 9/21/95	Wed 9/27/95
7	Award Subcontract	0d	Thu 9/28/95	Thu 9/28/95
8	Mobilize/Execution	50d	Wed 10/11/95	Tue 12/19/95
9				
10	**Drum Sampling Contractor**	**112d**	**Mon 7/17/95**	**Tue 12/19/95**
11	Bid Preparation	34d	Mon 7/17/95	Thu 8/31/95
12	BID PKG to PMO	0d	Tue 8/22/95	Tue 8/22/95
13	Bid on Street	14d	Fri 9/1/95	Wed 9/20/95
14	Bid Review/Award	5d	Thu 9/21/95	Wed 9/27/95
15	Award Subcontract	0d	Thu 9/28/95	Thu 9/28/95
16	Mobilize/Execution	50d	Wed 10/11/95	Tue 12/19/95
17				
18	**Waste Disp/Trans Contractor**	**118d**	**Mon 7/17/95**	**Wed 12/27/95**
19	Bid Preparation	34d	Mon 7/17/95	Thu 8/31/95
20	BID PKG to PMO	0d	Tue 8/22/95	Tue 8/22/95
21	Bid on Street	14d	Fri 9/1/95	Wed 9/20/95
22	Bid Review/Award	5d	Thu 9/21/95	Wed 9/27/95
23	Award Subcontract	0d	Thu 9/28/95	Thu 9/28/95
24	Mobilize/Execution	5d	Thu 12/21/95	Wed 12/27/95
25				
26	**Anlytical Testing Laboratory**	**103d**	**Mon 7/17/95**	**Wed 12/6/95**



Project: FRIDLEY NORTH 40
Date: Mon 7/31/95
Mike Finton

Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone ◇
Rolled Up Progress

ID	Task Name	Duration	Start	Finish
27	Bid Preparation	34d	Mon 7/17/95	Thu 8/31/95
28	BID PKG to PMO	0d	Tue 8/22/95	Tue 8/22/95
29	Bid on Street	14d	Fri 9/1/95	Wed 9/20/95
30	Bid Review/Award	5d	Thu 9/21/95	Wed 9/27/95
31	Award Subcontract	0d	Thu 9/28/95	Thu 9/28/95
32	Mobilize/Execution	50d	Thu 9/28/95	Wed 12/6/95



Project: FRIDLEY NORTH 40
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Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress

ID	Task Name	Duration	Start	Finish
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8	Mobilize/Execution	50d	Wed 10/11/95	Tue 12/19/95
9				
10	**Drum Sampling Contractor**	**112d**	**Mon 7/17/95**	**Tue 12/19/95**
11	Bid Preparation	34d	Mon 7/17/95	Thu 8/31/95
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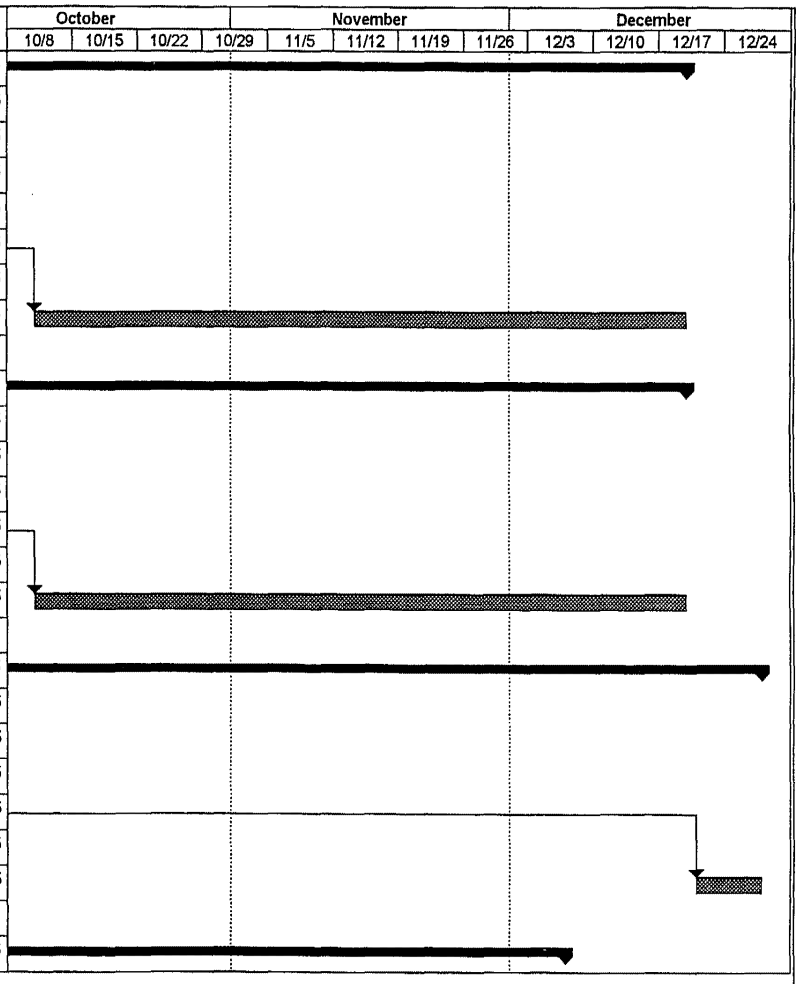

Project: FRIDLEY NORTH 40
Date: Mon 7/31/95
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Progress
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ID	Task Name	Duration	Start	Finish
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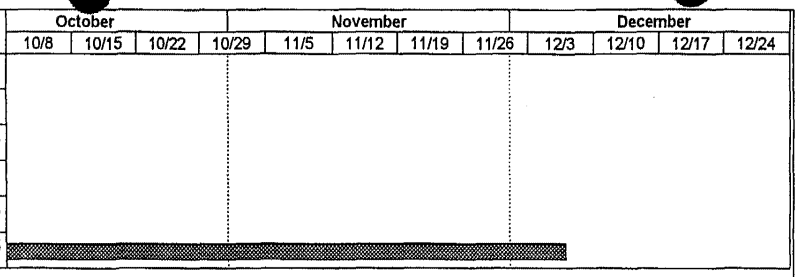
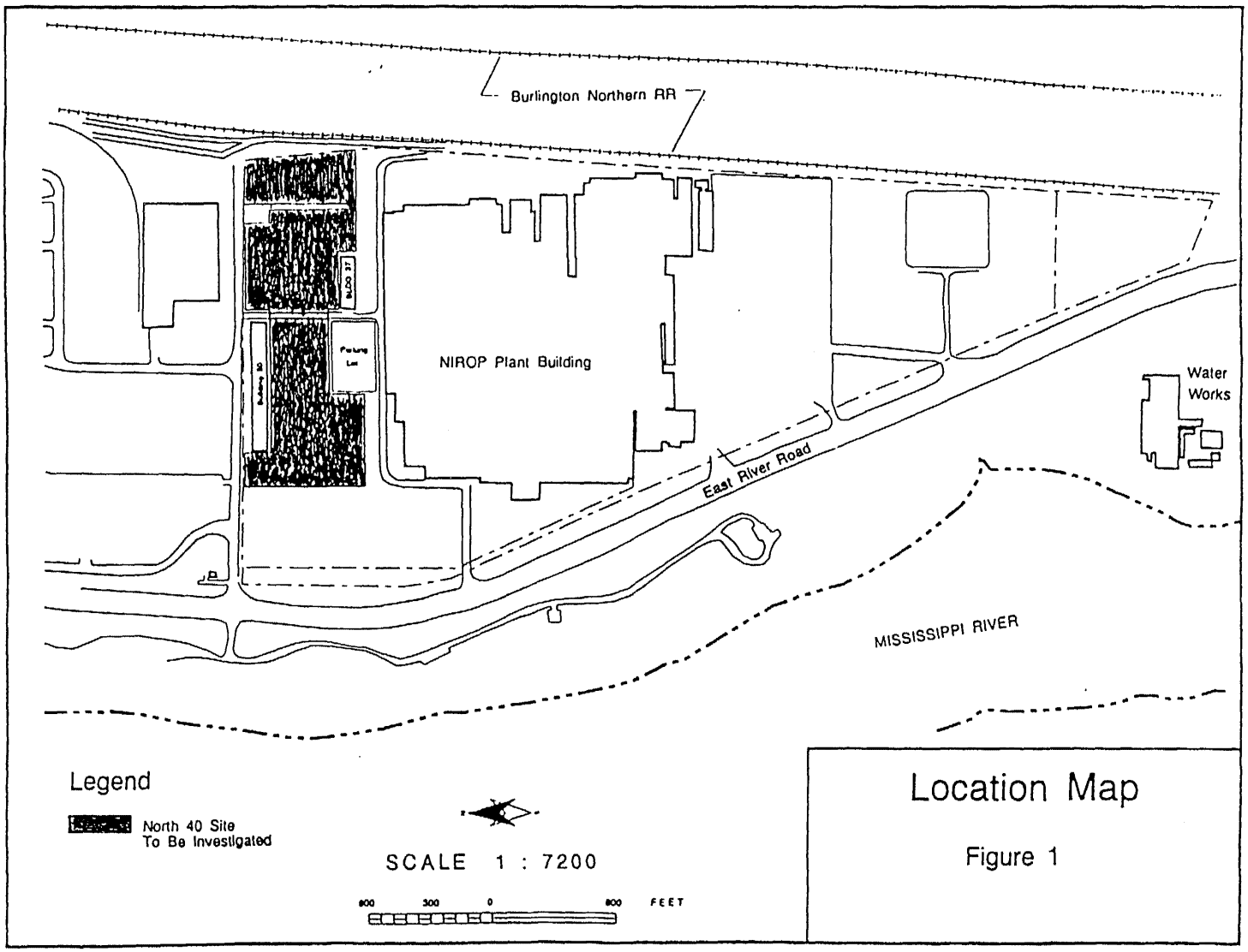


Project: FRIDLEY NORTH 40
Date: Mon 7/31/95
Mike Finton

Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress

12.0
REFERENCES

- "Remedial Investigation Workplan for the Soils Operable Unit at the Naval Industrial Ordnance Plant, Fridley, Minnesota," RMT, Inc., January 1992.
- "Remedial Investigation Report for the Soils Operable Unit at the Naval Industrial Ordnance Plant, Fridley, Minnesota," RMT, Inc., September 1993.
- "Geophysical Investigation of the Naval Industrial Reserve Ordnance Plant (NIROP), Fridley Minnesota," Geosphere Midwest, Inc., July 1995.
- Navy/Marine Corps Installation Restoration Manual, February 1992.
- 40 CFR Part 261 - *Hazardous Waste Identification and Listing.*
- 40 CFR Part 262 - *Standards Applicable to Generators of Hazardous Waste.*
- 40 CFR Part 263 - *Standards Applicable to Transporters of Hazardous Waste.*
- 40 CFR Part 268 - *Land Disposal Restrictions.*
- 49 CFR Part 172 - *Hazardous Materials Tables, Hazardous Materials Communications Requirements and Emergency Response Information Requirements.*
- 49 CFR Part 173 - *Shippers - General Requirements for Shipments and Packaging.*
- 49 CFR Part 178 - *Specifications for Packaging.*
- 29 CFR Part 1910.120 - *Hazardous Waste Operations and Emergency Response.*
- 29 CFR Part 1926 - *Safety and Health Regulations for Construction.*
- Minnesota Solid Waste Regulations Chapter 7035.
- Minnesota Hazardous Waste Regulations Chapter 7045.
- ASTM D 698 - *Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 Lb Rammer and 12-in Drop.*
- ASTM D 2922 - *Test Method for Density of Soil and Soil-Aggregate In Place by Nuclear Methods (Shallow Depth).*



Location Map

Figure 1

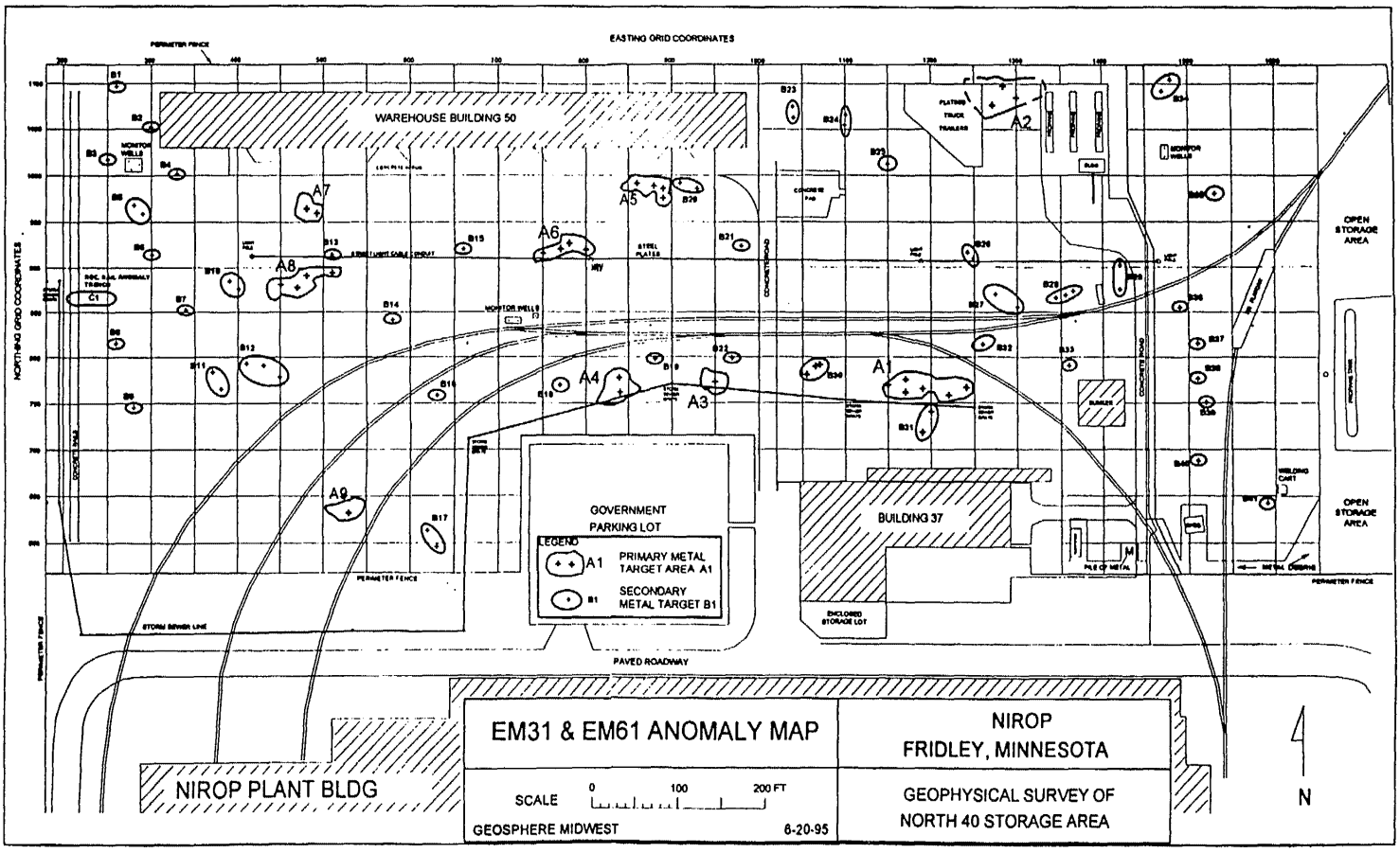

EASTING GRID COORDINATES
NORTHING GRID COORDINATES
PERIMETER FENCE
WAREHOUSE BUILDING 50
MONITOR WELLS
A1
A2
A3
A4
A5
A6
A7
A8
A9
B1
B2
B3
B4
B5
B6
B7
B8
B9
B10
B11
B12
B13
B14
B15
B16
B17
B18
B19
B20
B21
B22
B23
B24
B25
B26
B27
B28
B29
B30
B31
B32
B33
B34
B35
B36
B37
B38
B39
B40
C1
CONCRETE PAD
STEEL PLATES
CONCRETE ROAD
OPEN STORAGE AREA
GOVERNMENT PARKING LOT
LEGEND
A1 PRIMARY METAL TARGET AREA A1
B1 SECONDARY METAL TARGET B1
BUILDING 37
ENCLOSED STORAGE LOT
PILE OF METAL
WELDING CART
STORM SEWER LINE
PAVED ROADWAY
NIROP PLANT BLDG
EM31 & EM61 ANOMALY MAP
NIROP
FRIDLEY, MINNESOTA
SCALE 0 100 200 FT
GEOSPHERE MIDWEST
6-20-95
GEOPHYSICAL SURVEY OF
NORTH 40 STORAGE AREA
N

FIGURE 2

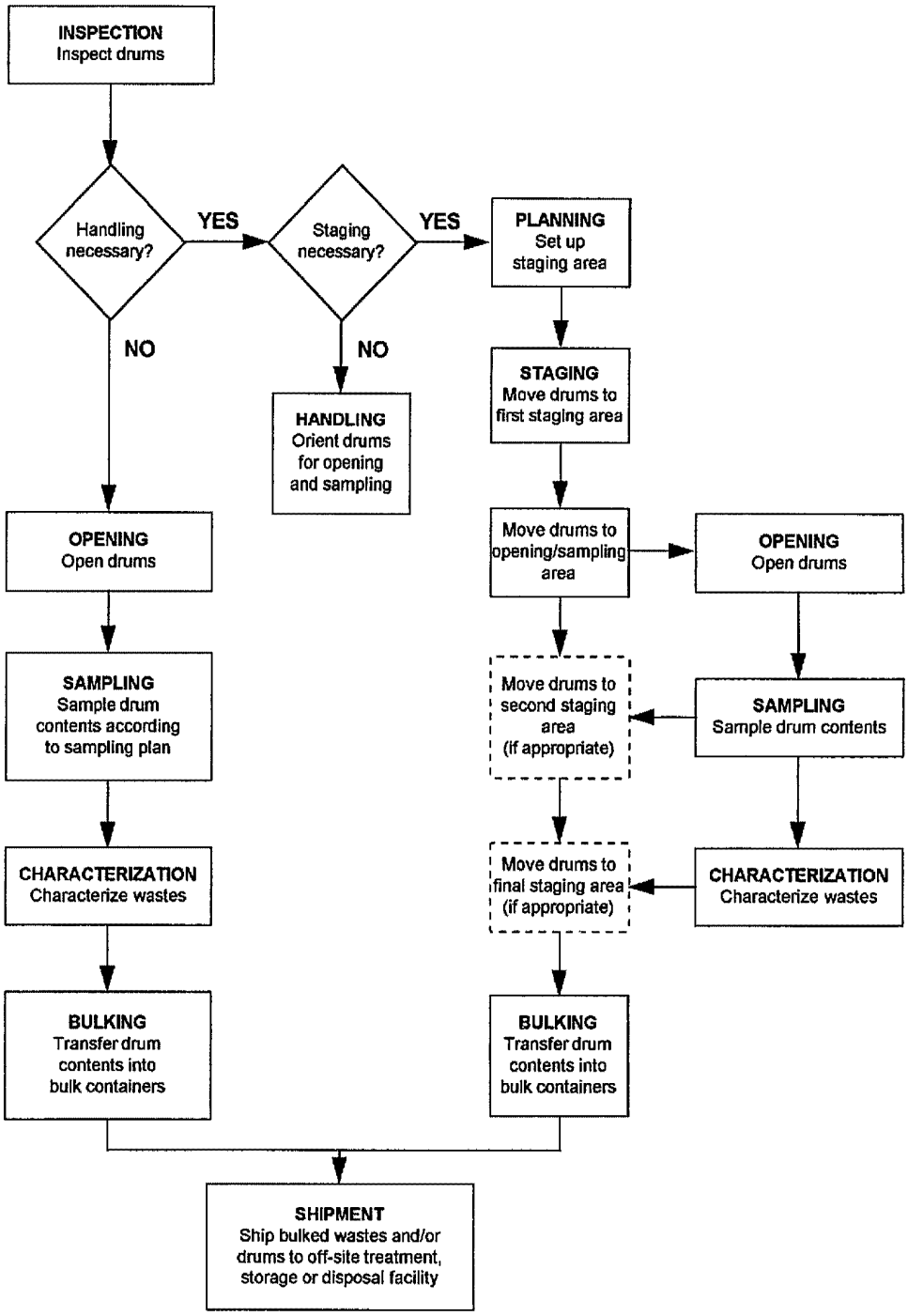


FIGURE 3
DRUM MANAGEMENT FLOW DIAGRAM

SITE: DRUM NO. SAMPLE NO. SCREENING RESULTS (AREA):

DRUM SIZE:

0	unknown	____
1	55 gal.	____
2	30 gal.	____
3	other	____
specify		____

DRUM OPENING:

0	unknown	____
1	ring top	____
2	closed top	____
3	open top	____
4	other	____
specify		____

DRUM TYPE:

0	unknown	____
1	metal	____
2	plastic	____
3	fiber	____
4	glass	____
5	other	____
specify		____

0	unknown	____
1	radioactive	____
2	acid/oxidizer	____
3	caustic/reducer/cyanide	____
4	flammable organic	____
5	nonflammable organic	____
6	peroxide	____
7	air or water reactive	____
8	inert	____

DRUM COLOR:

		PRI	SEC
0	unknown	__	__
1	cream	__	__
2	clear	__	__
3	black	__	__
4	white	__	__
5	red	__	__
6	green	__	__
7	blue	__	__
8	brown	__	__
9	pink	__	__
10	orange	__	__
11	yellow	__	__
12	gray	__	__
13	purple	__	__
14	amber	__	__
15	green-blue	__	__

DRUM CONDITION:

0	unknown	__
1	good	__
2	fair	__
3	poor	__

DRUM MARKING KEYWORD 1 _____

DRUM MARKING KEYWORD 2 _____

DRUM MARKING KEYWORD 3 _____

DRUM CONTENTS STATE:

		PRI	SEC
0	unknown	__	__
1	solid	__	__
2	liquid	__	__
3	sludge	__	__
4	gas	__	__
5	trash	__	__

SCREENING DATA:

	YES	NO	
RADIOACTIVE	__	__	$\geq$ 1 mR over background
ACIDIC	__	__	pH $\leq$ 3
CAUSTIC	__	__	pH $\geq$ 12
AIR REACTIVE	__	__	Reaction of $\geq$ 10°F temp. change
WATER REACTIVE	__	__	Reaction of $\geq$ 10°F temp. change
WATER SOLUBLE	__	__	Dissolves in water
WATER BATH OVA	__	__	Reading = ___ $\geq$ 10 ppm = Yes
COMBUSTIBLE	__	__	Catches fire when torched in water bath
HALIDE	__	__	Green flame when heated with copper
INORGANIC	__	__	WATER BATH OVA and COMBUSTIBLE = No
ORGANIC	__	__	INORGANIC = No

DRUM CONTENTS COLOR:

0	unknown	__	__
1	cream	__	__
2	clear	__	__
3	black	__	__
4	white	__	__
5	red	__	__
6	green	__	__
7	blue	__	__
8	brown	__	__
9	pink	__	__
10	orange	__	__
11	yellow	__	__
12	gray	__	__
13	purple	__	__
14	amber	__	__
15	green-blue	__	__

6	dirt	__ __
7	gel	__ __

DRUM CONTENT AMOUNT:

0	unknown	__
1	full	__
2	part	__
3	empty	__

CHEMICAL ANALYSIS:

	YES	NO
radiation	__	__
ignitable	__	__
water reactive	__	__
cyanide	__	__
oxidizer	__	__
organic vapor	__	___ ppm
pH	__	

ALCOHOL/ALDEHYDE	__	__	WATER BATH OVA, WATER SOLUBLE and COMBUSTIBLE = Yes
CYANIDE	__	__	Draeger tube over water bath $\geq$ 2 ppm
FLAMMABLE	__	__	COMBUSTIBLE = Yes and SETA flashpoint $\leq$ 140°F
OXIDIZER	__	__	Starch iodine paper shows positive reaction
INERT OR OTHER	__	__	Everything "No" except INORGANIC or ORGANIC

FIGURE 4
DRUM SCREENING FORM

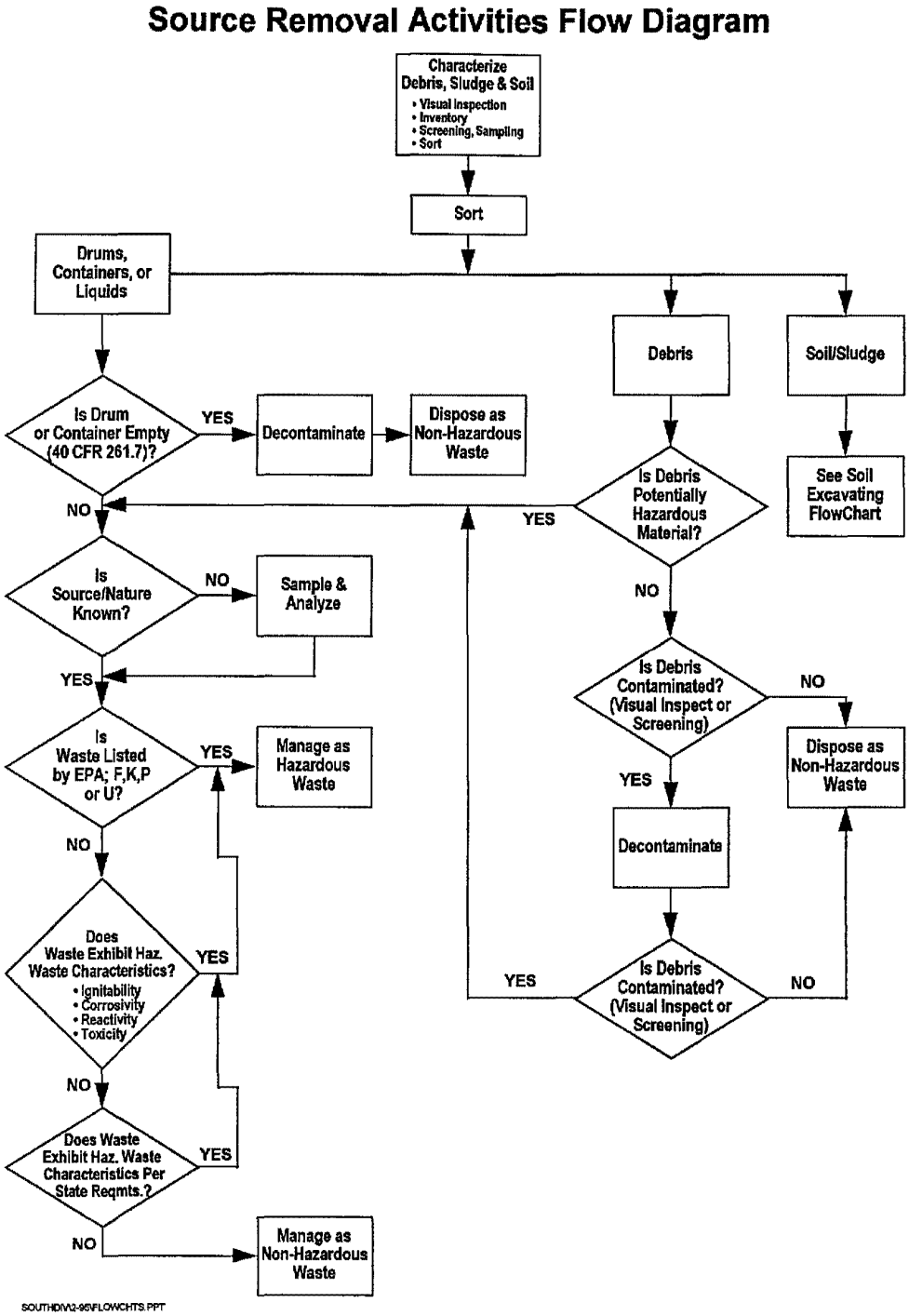
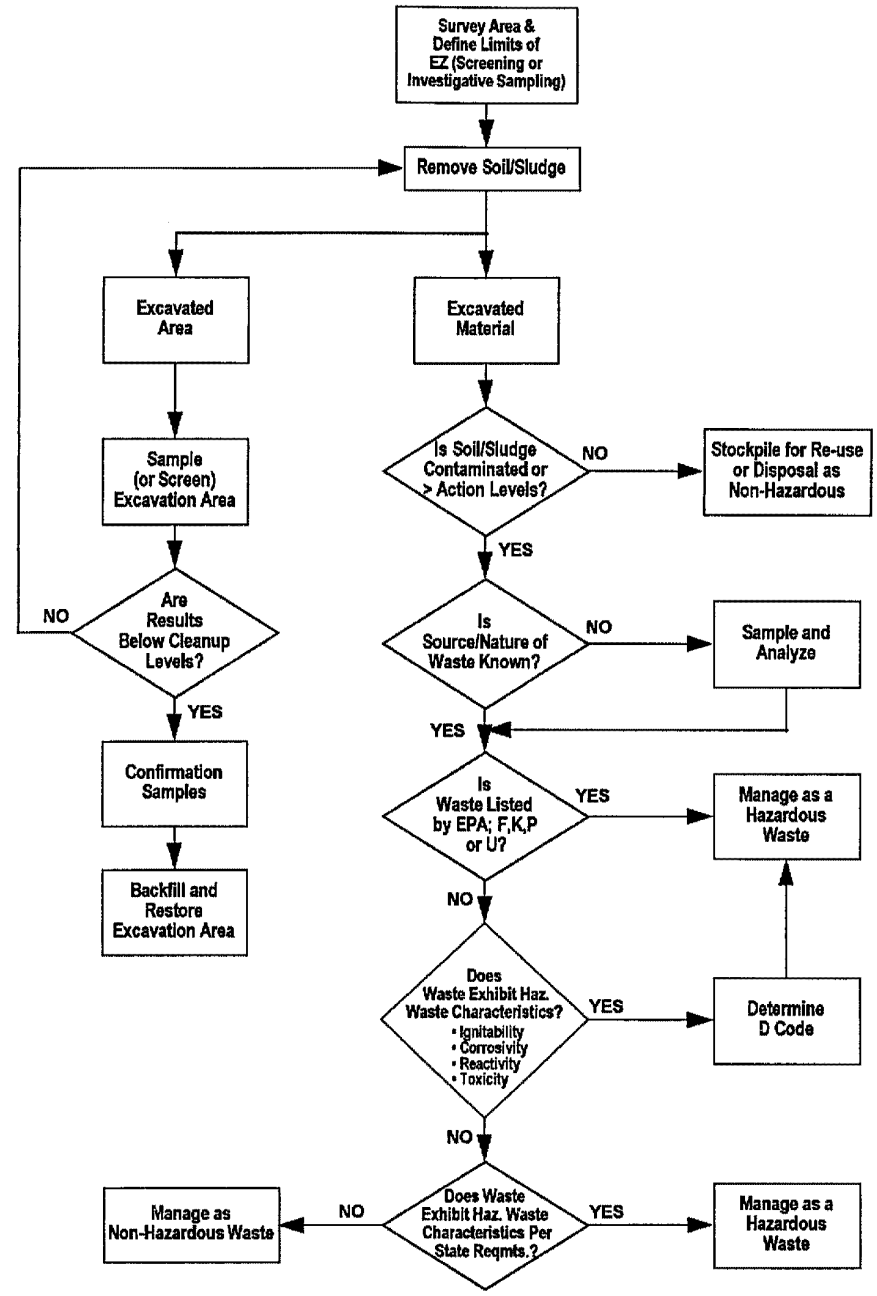


FIGURE 5
SOURCE REMOVAL ACTIVITIES FLOW DIAGRAM

Soil Excavating Flow Diagram



SOUTHDIV\2-95\FLOWCHTS.PPT

FIGURE 6
SOIL EXCAVATING FLOW DIAGRAM

APPENDIX A
SITE SAFETY AND HEALTH PLAN

Under Separate Cover

APPENDIX B
QUALITY CONTROL PLAN

Under Separate Cover

APPENDIX C
CHEMICAL DATA ACQUISITION PLAN

APPENDIX C
CHEMICAL DATA ACQUISITION PLAN

I. INTRODUCTION AND OBJECTIVES

1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

This Chemical Data Acquisition Plan (CDAP) is prepared for the NIROP Fridley North 40 interim removal action. NIROP Fridley is located near the twin cities of Minneapolis and St. Paul, Minnesota. The site began producing naval guns in 1941. The plant has diversified into the production of guided missile launching systems, various weaponry and hydraulic and electric power drive and control systems. The facility encompasses 138 acres. The federal government owns 83 acres which are operated by United Defense; the remaining 55 acres are owned and operated by United Defense.

The facility lies less than 1 mile south of Interstate 694 and approximately 1,000 feet east of the Mississippi River. The site is located on a broad, flat outwash terrace and is largely covered by pavement or buildings. The North 40 site, the subject of this Work Plan, encompasses approximately 22 acres and is located in the northern sector of the NIROP Fridley site, between Buildings 37 and 50.

1.2 ORGANIZATION OF DOCUMENT

The Chemical Data Acquisition Plan is divided into three parts:

I. Introduction and Objectives
II. Sampling and Analysis Plan
III. Quality Assurance Requirements

Part II includes all procedures to be used in the field, including sampling, documentation, decontamination, maintenance and calibration of equipment. Part III includes a discussion of data quality objectives (DQOs), aspects of data validation and quality control in the laboratory.

~~2.0 OBJECTIVES~~

~~The overall objective of this interim removal action is to excavate and dispose of drums which may potentially cause an imminent threat to human health and the environment at the NIROP Fridley. Based on previous geophysical surveys, several anomalies have been detected. The anomalous areas will be excavated to determine if buried drums exist.~~

2.0 OBJECTIVES

The overall objective of this removal action is to excavate and dispose of drums which may potentially cause an imminent threat to human health and the environment at the NIROP at Fridley. Based on previous geophysical surveys, several anomalies have been detected. Fourteen of the anomalous areas will be excavated to determine if buried drums exist.

Once drums are uncovered, the following sampling events will be performed:

- Field screen and make visual observations of unopened drums.
- Open drums and visually describe contents. Collect samples for compatibility testing by a mobile laboratory.
- Based on field characterization results and compatibility testing, bulk contents if possible.
- Collect composite samples for hazardous waste characterization parameter analysis by an offsite laboratory.
- Complete waste profiles for the bulked drum contents based on the offsite laboratory results.
- Collect confirmation soil samples from drum excavation areas.
- Collect samples from excavated soil proposed for use as backfill to determine if re-use criteria are met.
- Collect samples for off-site disposal from debris, visually-impacted soil and soil which exceeds the re-use criteria.
- Support health and safety requirements.

Data collection objectives are summarized in Table C-1.

II. SAMPLING AND ANALYSIS PLAN

1.0 PREPARATION FOR SAMPLING

Prior to sample collection, the following tasks will be completed:

1. Review any information (such as previous waste analysis, drum inventories, etc.) to gain general knowledge of the potential materials to be encountered.

2. Ensure that appropriate staging areas, decontamination pads and holding areas have been properly constructed. Sufficient room should be allowed for exclusion zones, contaminant reduction zones and support zones around staging areas where drums will be opened and sampled or where drum contents are bulked. Access to support vehicles, office trailers, etc. should not be affected by excavation activities.

3. Carefully review the Site Safety and Health Plan. All field personnel will attend a Health and Safety training meeting at the beginning of each task. Field personnel will be asked to document that training was completed, and that they will abide with the provisions stated in the Plan.

4. Establish an equipment locker or staging area. Inventory all supplies and maintain careful records of initial and continuing calibration for all monitoring equipment. Check supply lists daily to determine if additional items will be needed.

5. Collect the applicable health and safety and sample collection equipment for drum sampling. Other support equipment is provided in Table C-2.

    a. Health and Safety equipment will include, but not be limited to, a combustible gas indicator (CGI), organic vapor monitor (OVM), Draeger tubes, and personal air monitors. Sampling will be conducted in Level B (full face mask with SCBA or airline) protective clothing.

    b. Liquid samples will be collected using a coliwasa or equivalent equipment.

    c. Sludge and moist powdery samples will be removed from the drums using a trier or sludge judge. A larger trier will be used to collect large-grained solids.

    d. Decontamination equipment will include analyte-free water, alconox, nitric acid and isopropanol solutions, which may be provided by the offsite analytical laboratory. Decontamination procedures are included in Section 7.0 of this document.

e. Hand augers, stainless steel trowels, bowls and spoons will be used to collect discrete and composite soil samples from the base of each excavation area and stockpiled soil and debris removed from the drum excavation area.

6. Obtain all necessary documentation materials, including field data logging forms for field characterization analysis of drum contents, field logbooks, sample labels, chain-of-custody forms, Fed Ex airbills, etc.

7. Prepare for arrival of mobile lab at the site. Provide a set-up area convenient for electrical and water hookups. If such a site is not available, locate nearest power and potable and fire water supplies.

2.0 DRUM MANAGEMENT OVERVIEW

The purpose of this section is to provide a brief step-by-step procedure for drum sampling from the point a drum is excavated to the point it is shipped.

1. Once a drum has been excavated, it will be inspected by the Site Superintendent and/or the Project Manager.

2. If the drum is not bulging but is deteriorated and may collapse if moved, its contents will be transferred to a sound container, or the drum will be placed in an overpack container. The overpack container will be placed on a spill pallet and moved to a temporary staging area (TSA) for sampling. The empty drum will be disposed of as directed by Sections 3.4.5 and 8.0 of the Work Plan.

3. If the drum is bulging or shows signs of potential explosive rupture, it will be moved to an explosion-proof box and opened by the excavation subcontractor (ESC) using automatic piercing equipment. The pierced drum will be placed in an overpack container and moved by the ESC to the TSA for sampling.

4. If the drum is leaking but is removable from the excavation, it will be placed by the ESC in an overpack container on the spill pallet at the edge of the excavation, moved to the TSA and opened for sampling.

5. If the drum is not leaking or bulging and does not show any other signs of instability, in the opinion of the Site Superintendent and/or Project Manager, it will be placed directly on the spill pallet, moved to the TSA and opened for sampling.

6. Drums to be opened at the TSA will not be stored with previously opened drums. An area in the TSA will be designated for opening drums to minimize or prevent interaction between drum contents. See Section 4.2 for drum opening and sampling procedures, to be completed by the drum sampling subcontractor.

7. Description of drum contents will be as comprehensive as possible, yet concise enough to minimize exposure of the field team to contaminants. Criteria are provided in Section 4.3. Samples of liquid, solids or sludge will be collected as described in Section 4.2.

8. Once opened drums have been sampled, they will be marked (Section 10.1) and moved to a holding area pending results of hazardous category (HazCat) parameter testing/compatibility testing by the mobile laboratory (Section 5.1).

9. Following completion of field characterization and compatibility testing, the drum or container will be moved from the holding area to a final staging area for bulking and/or cataloging. Like wastes will be bulked (Section 5.2) and stored. Following bulking, composite samples will be collected from drums or bulk containers and submitted for offsite laboratory analysis (Section 6.1).

10. Following receipt of analytical data and evaluation, waste profiles for the drums and containers stored in the final staging area will be finalized and the waste will be shipped to a disposal facility. Further detail on waste disposal documentation and shipment are provided in Section 8.0 of the Work Plan.

Soil management procedures are described in the Work Plan, Section 3.0.

3.0 RESPONSIBILITIES OF CONTRACTORS

3.1 MORRISON KNUDSEN (MK) - PRIME CONTRACTOR

- Oversight of all Subcontractor Activities
- Project Controls and Contracting
- Site Safety and Health Management
- Program and Project Management
- Field Management
- Sampling soil from excavation areas
- Sampling of debris and stockpiled soil
- Oversight of waste profiling and shipment

3.2 EXCAVATION SUBCONTRACTOR

3.2 SUBCONTRACTOR

- Excavation of soil and drums within areas specified by MK and the NAVY.
- Removal of drums from excavation.
- Removal and repacking of drum contents from deteriorated drums.
- Opening of bulging or unstable drums (automatic).
- Manual opening of drums, as directed by the Site Superintendent, Project Subcontractor and MK

Manager and/or Project Engineer.

- Collection of samples from drums.
- Field characterization of samples (service to be provided by on-site laboratory).
- Oversight and contracting, as applicable, of mobile laboratory facilities.
- Inventory and documentation of drums and contents.
- Removal and overpacking of leaking drums.
- Movement of drums, containers or pallets between staging areas and the excavation areas.
- Bulking drum contents, under the direction of MK.

4.0 SCREENING, DRUM OPENING AND SAMPLING PROCEDURES

The following subsections include specific procedures for screening, opening and sampling drums or containers.

The following assumptions are the basis for the procedures:

- Based on site records, no radioactive materials were introduced to the site.
- "Drums" described below refer to stable, non-leaking, non-bulging drums removed from the excavation. "Containers" refer to overpacked, slightly unstable drums or repacked drum contents removed from deteriorated drums.
- All sampling and drum opening will be conducted in Level B PPE.
- Drums containing less than three percent by weight or less than one inch of material are empty under Minnesota Regulations Part 7045.0127 and any remaining contents are not considered hazardous waste. These drums will be opened and screened only (no samples will be collected).

4.1 INITIAL FIELD INSPECTION AND SCREENING OF DRUMS AND CONTAINERS

Drums that will be excavated during the removal action may contain liquids, solids or sludges. Due to the unknown nature of the contents of the drums, inspection and screening will be performed immediately upon removal of the drum from the excavation area. The following items will be checked. Data will be recorded on the field characterization data sheets.

- Symbols, words or other marks on drum indicating contents;
- Signs of deterioration such as corrosion or rust;
- Evidence of leakage;
- Swelling or bulging;
- Drum type (polyethylene, steel, aluminum, etc.);
- Drumhead configuration (open, closed);
- Presence of explosive atmosphere around the drum; and
- Presence of organic vapors.

4.2 DRUM OPENING AND SAMPLING (STABLE DRUMS)

4.2.1 Closed-top Drums.

1. Position the container with the opening in an upright position.

2. Slowly loosen the closure. Use a nonsparking drum wrench on closures allowing any gas pressure to release. The sampler shall be in a position to minimize the potential for danger from exposure or sudden pressure release. If the closure cannot be opened, open the drum using a remote mechanical opening device.

3. Remove the closure and collect a sample through the opening with a disposable glass tube, coliwasa, peristaltic pump or vacuum sampler by inserting the equipment to the bottom of the drum to ensure a representative sample.

4. Ensure that all elements of a particular drum or liquid container are sampled, i.e. check for phases.

5. If more than one phase or layer exists, sample each phase or layer separately to ensure viable results from compatibility testing.

6. Samples that can be visually determined to be homogeneous may be sampled with a coliwasa. A dipper or peristaltic pump may be used or contents in the drum or container may be poured if allowable.

7. Transfer the sample to a certified clean sample container, provided by the laboratory.

8. Clean the exterior of the sample container and ensure that the container is tightly sealed before applying the sample label.

4.2.2 Opened-top Drums.

1. Open the container slowly to minimize the generation of airborne particles.

2. Using a trier, scoop or dipper, collect a sample from the container by obtaining a representative sample through the depth of the drum; if it is not possible to obtain a single sample, sample at least five locations within the container and composite the samples. Samples for VOCS will be collected and immediately placed into certified clean jars. No compositing will be done for VOC samples.
   Note: When sampling solid materials, consideration must be given in situations where the material has changed state (i.e., decomposed). For example, water reactive metals will hydrolyze in the presence of moist air.

3. A stainless steel or polyethylene spoon may be used to mix the sample to improve homogeneity.

4. Transfer the sample to a certified clean 100 mL or equivalent sample container. Samples will be taken to the mobile laboratory for testing. A summary of analytical parameters for mobile laboratory characterization analysis is provided in Section 5.1.

5. Clean the exterior of the sample container and ensure that the container is tightly sealed before applying the sample label.

4.3 VISUAL OBSERVATIONS

During sample collection, the field team will record observations of the drum contents. These observations include, but are not limited to, the following items. This information will be recorded on the field characterization data sheets.

- Color
- Viscosity
- Air reactivity (foaming, bubbling, evaporation, changes in state)
- Drum content amount
- Combustible Gas Indicator (CGI) readings
- Organic Vapor Monitor (OVM) readings
- General appearance

5.0 ON-SITE WASTE CHARACTERIZATION AND BULKING

5.1 WASTE CHARACTERIZATION

The mobile laboratory will conduct field compatibility testing of samples collected from each drum (one per container or drum). The objective of mobile laboratory testing is to determine the appropriate disposition the wastes, either as hazardous or nonhazardous. The list of criteria includes:

- Acidic/Caustic (pH)
- Specific Gravity, Viscosity
- Air Reactivity
- Water Reactivity
- Water Bath Organic Vapor Analysis
- Combustibility
- Trinitrotoluene (TNT) Field Screening
- PCB Field Screening
- Presence of Halides/Phosphates
- Presence of Inorganics (metals, metals compounds)
- Presence of Organics (organic functionality)
- Presence of Alcohol/Aldehyde

- Presence of Cyanide/Sulfide
- Flammability Tests
- Oxidizing/Reduction Capacity
- Inert or other criteria

These tests require sufficient laboratory bench space, as well as adequate ventilation, regulated temperature, dry conditions and controlled test space (i.e. hood). Laboratory procedures, including test datasheets, will be reviewed for each of the above tests prior to the start of work. Samples will be labeled as described in Section 10.2. Sample logging sheets will also be available for review by MK.

All visual observations and mobile laboratory data will be reviewed to determine if the drum contents can be bulked into one of four major categories:

- Hazardous Liquids
- Hazardous Solids/Sludge
- Non-hazardous Liquids
- Non-hazardous Solids/Sludge

5.2 WASTE BULKING PROCEDURES

Bulking of materials will be performed by the excavation subcontractor at the final staging area pending the results of field characterization. Bulking will be in compliance with 40 CFR 265, Appendix V (Examples of Incompatible Waste).

The following procedures are from Chapter 11, "Handling Drums and Other Containers," from **Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.** (October 1985). Bulking of hazardous liquids will be completed using Level B PPE. Health and Safety monitoring will be conducted during bulking as described in the Site Safety and Health Plan.

1. Inspect each tank or bulking drum and remove any residual materials from the interiors prior to transferring any bulked materials.

2. To move hazardous liquids, use pumps that are properly rated (see NFPA 70 Articles 500-503 and NFPA 497M) and that have a safety relief valve with a splash shield. Make sure the pump hoses, casings, fittings, and gaskets are compatible with the material being pumped.

3. Inspect hose lines before beginning work to ensure that all lines, fittings, and valves are intact with no weak spots.

4. Take special precautions when handling hoses as they often contain residual material that can splash or spill. Protect lines from vehicular and pedestrian traffic.

5. Store flammable liquids in approved containers.

6. Bulking must be completed prior to waste haulers entering the site.

Within each of the four major categories, segregate drums or bulk containers using chemical categories (acids, heavy metals, pesticides, etc.) as determined by field/mobile laboratory testing. This segregation will be finalized following offsite analysis of hazardous waste characterization samples.

6.0 SAMPLING AND ANALYSIS - OFF-SITE CHARACTERIZATION

Off-site analysis of confirmatory soil samples and disposal samples shall be performed by a laboratory approved by the United States Environmental Protection Agency or listed in *Certified Environmental Testing Laboratories* (Public Health Laboratory Division - Minnesota Department of Health, January 10, 1996).

Samples will be collected from drummed or containerized solids, drummed liquids, tanks of bulked liquid, oil containers or rolloff or stockpiled incidental soil and/or debris. Table C-3 includes the hazardous waste characteristic tests for each medium to be sampled. The analytical data from the tests will be provided to the disposal facility receiving the waste. The list of methods in Table C-3 may be revised, at the discretion of the Project Manager, for acceptance criteria to be met.

6.1.1 Drummed Solids

Grab samples will be collected as described above in Section 4.2.2 from each category of solids. Collect one grab sample per drum for compositing. Combine five grab samples in a stainless steel bowl. Fill the appropriate laboratory jars (Table 2) using the composited solids. The sample for TCLP-volatile organic compounds will be collected as a grab sample only; a composite will not be collected.

6.1.2 Drummed Liquids.

Sampling procedures in Section 4.2.1 will be used for liquid sample collection from drums. Liquid samples may be composited from one to five drums, in a particular chemical category. Grab samples will be collected from each drum. Up to five grab samples will be combined in a stainless steel bowl or equivalent container. The composite sample will be withdrawn from the mixture. Care will be taken not to mix potentially reactive liquids. Composite samples will be noted on the chain-of-custody form.

6.1.3 Bulked Liquids (tank sampling)

1. Divide the surface of the material into two parts. Collect one sample each from the upper, middle and lower portion of each part with a weighted bottle sampler, coliwasa, trier dipper, vacuum sampler, peristaltic pump or bomb sampler.

2. A sample can be obtained through a bottom valve if no other access point is available. In some instances, such a sample must be documented that it may not be representative of the overall tank contents.

3. Clean the exterior of the sample container and ensure that the container is tightly sealed prior to applying the sample label.

6.1.4 Oil Sampling

It is anticipated that little oil will be recovered from excavated drums. Oil discovered will be placed in polyethylene containers. Oil will not be bulked. One sample of oil will be collected per drum or container and submitted for analysis as described in Table C-3.

6.1.5 Stockpiled soils/debris

Soil and debris removed during the drum excavation shall be placed in temporary stockpiles. Material which is potentially impacted, based on visual observation, will be segregated and sampled. Impacted soils from each excavation shall not be commingled.

Wastes shall be stored at the site for a period not to exceed 90 days.

Samples will be collected from impacted soil in a manner and at a frequency agreed to by the MPCA and the Navy. Target compounds are listed in Table C-4 (attached). This list may be abbreviated based on evaluation of drum contents.

General procedures for stockpile sampling include the following:

1. Using a hand-auger, trier, scoop or other appropriate sampling equipment, collect grab samples from the stockpile. Locations will be designated by the Project Engineer or designee. The sampling device shall be inserted approximately six inches into the soil. Mix the grab samples from a single stockpile in a stainless steel bowl to form a single composite sample. Assure that sufficient volume has been collected and composited to fill all sample containers, with the exception of volatile organic compounds.

2. Samples to be tested for VOCs shall not be composited. Collect a single grab sample from the center of the pile, or from an area potentially high in contamination (i.e. oily soil).

3. Transfer the grab sample (VOCs) or composite sample material (all other analyses) to the appropriate certified clean sample containers. See Table C-4 (formerly Table C-3 - see note under Tables below) for bottle size requirements and holding times. Fill the containers in the order shown on the table. The sampler shall also collect sufficient sample volume for disposal analyses (reactivity, ignitability, TCLP-VOCs, TCLP-SVOCs, TCLP-pesticides and TCLP-inorganics). Each of the disposal analysis bottles shall be labeled "Hold Until Further Notice." These sample containers shall be stored on site in a refrigerator or cooler designated for this purpose, pending evaluation of results from the regular analysis.

4. Soil pH shall be measured by the laboratory for the regular samples. Corrosivity (pH) samples have a short holding time (2 days) and will not be stored. If corrosivity samples are collected (disposal analysis), they will be submitted immediately with the regular samples.

5. Clean the exterior of the sample container and ensure that the container is tightly sealed before applying the sample label.

6. Submit samples of stockpiled soil for regular analysis. The parameters listed in Table C-5 will be analyzed.

   The results of the regular analysis will be compared to the screening levels listed in Table C-5. If screening levels are exceeded for a particular sample, disposal samples will be submitted for analysis. If screening levels are not exceeded, the MK Project Manager and Navy representative will evaluate the use of the associated stockpiled soil for use as backfill. If the stockpiled soil is used as backfill, the disposal samples will be discarded into the stockpile from which they originated. Empty sample containers shall be disposed with the other solid sampling wastes.

7. Submit samples from impacted soil (i.e. not potential backfill) for disposal analyses as shown on Table C-4.

~~6. Submit samples for full TCLP analysis. See Table C-3 for bottle size requirements and holding times.~~

6.2 EXCAVATION SOIL SAMPLING

Soil samples will be collected by MK from each excavation area once all drums have been excavated and prior to backfilling. A minimum of two samples will be collected from the base of each excavation. Field observation will be used to select soil sampling locations. Soil samples should be collected in areas where leaking drums may have been observed or where field screening with an OVM indicates contamination may be present.

Field observation will be used to avoid taking saturated soil samples, as the groundwater at the facility is known to be contaminated and is currently being remediated. Note in the field logbook if groundwater or stormwater is present in the excavation. Sampling procedures for incidental water present in the excavation are provided in Section 6.3.

Grab samples will be collected from each designated sampling location using a stainless steel trowel or a hand auger. A hand auger consists of a sample bucket attached to the bottom of a length of pipe that has a crossbar at the tip. A hole is drilled by turning this crossbar at the same time the operator presses the auger into the ground. The following procedure will be used in collecting soil samples:

- Prior to collecting soil samples, sample locations will be identified, marked and recorded in the field logbook. Depending on the size of the excavation, the base may be gridded and sampled at the discretion of the Project Manager. A minimum of two locations will be identified to be sampled. Distances will be measured between sampling locations and permanent features (i.e. buildings).

- Decontaminate the sampling equipment prior to and between sampling locations using procedures described in Section 7.0.

- Drive the bucket of the hand auger to the desired depth, within two feet from the ground surface.

- Withdraw the hand auger from the sample area and use a stainless steel spoon to retrieve a sample from the sample bucket.

- Collect samples for volatile organic compound (VOC) analysis by filling the sample container completely with soil, being careful to leave no headspace in the container.

Note: This sample should not be mixed since it is very important to obtain the VOC sample as quickly as possible to minimize the off-gassing of volatile

constituents. Large pebbles and cobbles should be removed from the sample.

- Place soil into sample jars in the order listed in Table C-3. The jar will be labeled in accordance with Section 10.2.

- When a trowel is used, the sample will be collected from the first six inches of the ground surface.

Note: Use of a trowel is appropriate only when collecting a sample from an excavated area. Using a trowel in an unexcavated sample will cause the sampler to collect a weathered sample.

Soil samples will be analyzed according to the analytical methods listed in Table C-3.

6.3 WATER SAMPLES

During remedial activities, surface water may infiltrate into the excavation. This water will be pumped from the excavation into a tank or drum, depending on the volume. A water sample shall be collected from each container in accordance with the procedure included in Section 6.1.3. Care shall be taken not to disturb the settled solids at the tank or drum bottom when collecting the sample.

If a pump is utilized, water will be pumped from the tank at a low rate (<200 ml/min for VOCs) and 5 gpm or less for other constituents. Samples shall be collected and submitted for analysis of the sanitary sewer discharge parameters, as indicated on Table C-4. If any discharge criteria are exceeded, the samples shall be analyzed for additional disposal requirements (also shown on Table C-4).

6.4

It is anticipated that data from discharge parameter analysis will be used for disposal characterization, if necessary. Additional volume will be sampled and analyzed for reactivity, ignitability and other parameters as required by the disposal facility. Water pH will be measured during discharge parameter analysis.
and groundwater are detailed in the work plan.

6.5 QA/QC SAMPLES

Quality control samples will be collected in the field to enable identification of field and/or laboratory conditions that may affect the data quality and data usability. Field quality control samples to be collected as part of the NIROP Fridley sampling activities include trip blanks, equipment rinsate blanks, field blanks, and field duplicates.

6.5.1 Trip Blanks

Trip blanks consist of two 40-mL glass volatile organic analysis (VOA) vials containing analyte-free water taken from the laboratory, shipped to the sampling site with the sample containers and returned to the laboratory with the VOC samples. One trip blank will accompany each cooler containing samples for VOC analysis throughout the field storage, shipping, laboratory storage and analytical process. Trip blanks are only analyzed for VOCs and indicate when cross-contamination may occur due to atmospheric conditions within the cooler or within the laboratory.

6.5.2 Equipment Rinsate Blank

An equipment rinsate blank will be collected to ensure that sampling equipment is clean and that the potential for cross contamination has been minimized by the equipment decontamination procedures. This blank will be collected following the first sample equipment decontamination activity of the day. Analyte-free water will be poured over cleaned sampling equipment and collected in appropriate sample containers. An equipment rinsate blank will be collected once daily following completion of decontamination. The equipment rinsate blank will be analyzed for identical parameters as the environmental samples collected that day.

6.5.3 Field Blanks

Field blanks will consist of the source water used in decontamination and steam cleaning. At a minimum, one field blank from each event and each source of water must be collected and analyzed for the same parameters as the related samples.

6.5.4 Duplicate Samples

Duplicate samples will be collected to allow determination of analytical and sampling precision. One duplicate sample in every ten (10) environmental samples will be collected and submitted for the identical parameters as the regular samples.

7.0 DECONTAMINATION PROCEDURES

A decontamination facility will be provided at each site, as possible. The station will have containment for the collection of washwater and be protected from the rain. The decon facility will be adequate in size to decontaminate all excavation and sampling equipment. The station will be located as close as practically possible to the contamination reduction zone.

All non-disposable equipment (*i.e.*, triers, spoons and stainless steel bowls) will be decontaminated according to procedures summarized below:

- Wash with Alconox™ solution
- Tap water rinse

- Methanol or isopropanol rinse
- Analyte-free water rinse
- Nitric Acid (< 10%) rinse (metals)
- Analyte-free water rinse

8.0 CALIBRATION AND MAINTENANCE OF FIELD INSTRUMENTS

Measurements that affect the quality of an activity or operation will be taken only with instruments, tools, gauges, or other measuring devices that are controlled, calibrated, adjusted and maintained at predetermined intervals to a specified accuracy. The calibration and maintenance of field equipment and instrumentation will be in accordance with manufacturer's specifications or applicable test specifications, and shall be documented in the Daily Activity Logbook. The calibration program described in the Quality Control Plan will be followed for all instruments requiring calibration. Air monitoring equipment used for personnel exposure monitoring will be calibrated daily, or after long periods of non-use during the day.

Preventive maintenance programs will, as a minimum, be established for equipment that would otherwise be subject to breakdown, when the breakdown could lead to safety hazards, environmental contamination, or loss of completeness and accuracy in data. The program will include a schedule of the important preventative maintenance tasks that will be carried out to minimize downtime of measurement systems, and a list of any critical spare parts that need to be on hand to minimize downtime.

9.0 FIELD DOCUMENTATION

During the field investigation, various field books, reports, and logs will be maintained by the field teams. Field documentation logbooks include Daily Activity Log which will include Field Characterization Data Sheets (Drum Contents), Soil Sampling Data Sheets (Soil Sampling) and Non-Routine Occurrence forms.

The designated field team leader will maintain a Daily Activity Log in a bound notebook. In this log, the field team leader will record the on-site activities in real time, including all individuals on-site and sampling information, such as sample location, sample number, number of bottles collected, etc. If multiple activities are taking place at one time, the field team leader will record this in the Daily Activity Log and the other field team will use a second bound notebook to record their activities. Recorded information will include, as a minimum, the following:

- Project name and number
- Individuals on site
- Current date, pertinent times (in military time), and ambient weather conditions
- Instrument calibration information
- Results of air monitoring and personal protective equipment levels
- Sample locations, sample numbers and depths

- Sample collection method
- Sketch or grid defining soil sampling locations
- Sample numbers, number/type of containers, sample time and date
- Analyses requested and laboratory assignments
- Samplers name and signatures
- Type of sample collected
- Copies of chain-of-custody forms
- Decontamination activities
- Deviations from the sampling plan
- Other notes and information, as required

10.0 DRUM LABELING, SAMPLE DOCUMENTATION AND CHAIN-OF-CUSTODY PROCEDURES

10.1 DRUM LABELING

10.1.1 Containers of Soil and/or Solids.

All containers for temporary storage of hazardous waste soil, prior to shipping for disposal, will be marked and labeled in accordance with 40 CFR Subpart C. The containers shall also be labeled with the date of generation, the name of the COTR, the Contractor's name, a contact phone number (NIROP FRIDLEY), the term "pending analysis" and the area the drum was excavated.

Prior to shipment, the Contractor shall label all containers containing hazardous waste soil with labels specified for the material in 49 CFR 172.101, Hazardous Material Table and in Subpart E.

10.1.2 Containers of Liquids.

All containers for temporary storage of hazardous waste liquids, prior to shipping for disposal, shall be marked and labeled in accordance with 49 CFR Subpart C. Containers shall also be labeled with the date of generation, the name of the COTR, the Contractor's name, a contact phone number (NIROP FRIDLEY), the term "pending analysis" and the area the drum or contents was recovered from.

10.2 SAMPLE DOCUMENTATION

Samples will be labeled, preserved, and properly packaged for shipment to the offsite analytical laboratory. Information on the sample label will include:

- Sample identification number;
- Initials of the individual collecting sample;
- Date and time of sampling;
- Place of collection;
- Preservatives added, if any; and

- Analytical parameter(s).

Sample identification numbers will provide for a tracking procedure allowing information on a particular sample location to be easily and accurately retrieved. This system also ensures that each sample is unique identified and not confused with any other sample. The Project Manager and Field Sampling Manager will maintain a complete list of sample numbers. The sample identification number consists of eight alpha/numeric characters that represent the following information:

- Project Name
- Site Name
- Sampling Event
- Sample Matrix
- QC sample type (when applicable)
- Sample interval or depth (when applicable)

The project will utilize a specific prefix, FRI, separated from the sample identification number with a backslash (e.g., FRI\123-456-78).

The first three digits indicate the sample origin. These digits are alphanumeric and are created with some mnemonic device for the true name of the site. The first digit is an alphabetical character in order to facilitate data processing. Sample origin abbreviations are developed according to specific project requirements. Examples are given below:

- Site A1 - SA1
- Drum 37 - D37
- Roll-off 2 - R02
- (water) Tank 1 - T01
- Debris Pile 1 - DP1
- Soil Stockpile 1 - SS1

The sampling event and matrix are represented by digits 4, 5 and 6. Designations may include the following:

- FSS - field screening sample
- WCS - waste characterization sample
- SCS - soil characterization sample

The seventh and eighth digits indicate the sample number. Duplicate samples have the same sample identification, but contain the letter "D" as the ninth digit. For example:

- FRI\SA1-FSS-01 represents a field screening soil sample from Site A1, collected from the first drum sampled and analyzed for compatibility criteria (Section 5.1).

- FRI\SA1-FSS-02 represents a duplicate of the above example (blind label).
- FRI\T01-WCS-01 represents a waste characterization sample collected from Tank 1.
- FRI\SA5-SCS-02 represents the second soil characterization sample collected from Site 5 excavation.

Additional QA/QC samples are numbered by replacing digit 4 with the proper QC sample code, listed below, followed by the number of the sample (digit 5) and the month and day it was collected as digits 6, 7, 8 and 9. For example, August 14 would appear in the last four digits of the sample identification number as 0814. QC sample codes used during the project are:

- F - field blank
- E - equipment rinsate
- T - trip blank

An example sample label for a trip blank to be sent with Site A1, VOC samples on August 14, 1995 would be FRI\SA1-T1-0814.

The sample number is entered on sample labels, chain-of-custody forms, and in the appropriate section of the Testing Plan and Log found in the QC Plan. All sample identification information will also be documented in the sampler's field logbook, including pertinent information not incorporated in the sample number.

Samples will be placed in shipping containers that are locked or sealed for shipment to the laboratory. Custody seals will be affixed to the sealed shipping container and/or individual sample containers. Information on the custody seal will include the date when the container was sealed and the signature of the sampler or relinquisher. Broken custody seals will be noted in the remarks section of the chain-of-custody record.

10.3 CHAIN-OF-CUSTODY FORMS

All sample shipments will be accompanied by a chain-of-custody record, which will include the following information:

- Package contents;
- Sample identification numbers;
- Sample site;
- Date and time of sample collection;
- Analytical tests for each sample;
- Appropriate project identification information;
- Name of sampler(s);
- Analytical lab;
- Turn-around time
- Indicator if potentially "high" level contamination in sample

- Sample type (*i.e.*, grab, composite);
- Matrix samples designation;
- Type of sample container; and
- Preservatives.

The chain-of-custody record will be completed with information and wording consistent with information and wording reported on sample labels and seals.

When transferring custody the sampler will record the time and date and sign the chain-of-custody form in the "relinquished by" block. The receiver will sign "received by" block upon sample receipt. The original chain-of-custody record will accompany the shipment, and a copy will be retained by the Project Manager or designee. A signed chain-of-custody record will obtained from the laboratory custodian after the samples have been received and their condition checked.

11.0 SAMPLE PREPARATION, PRESERVATION AND PACKAGING AND SHIPMENT

Immediately after collection, samples will be transferred to properly labeled sample containers with all necessary preservatives added. Table C-3 lists the proper container material, volume requirements, and preservation needed for the sampling effort. Samples requiring refrigeration for preservation will be immediately transferred to coolers packed with ice or ice packs. Proper chain-of-custody documentation will be maintained as discussed in Section 10.0 - Documentation and Chain-of-Custody Procedures.

Packaging and shipping procedures will vary depending upon sample media, contaminant concentration, preservation technique, and sample container. A waterproof metal or equivalent strength ice chest or cooler is suitable for packaging and shipping samples not considered "Dangerous Goods" by the U.S. Department of Transportation (USDOT). The person packaging the samples is responsible for ensuring that the cooler is in suitable condition for shipping. In the event a concern arises regarding whether a sample shipment is a USDOT "Dangerous Good", the Project Engineer will be consulted.

Sample packaging should ensure that the chance of breakage is minimized and that, in the event a sample container breaks or leaks, it will not impact the integrity of other samples in the shipment. Also, samples should be protected from ice melt. Each sample container should be placed in a ziploc-type bag, and packing material such as bubble wrap, vermiculite, or comparable shock-absorbing materials should be used when shipping glass containers to avoid breakage. Adequate ice, contained in durable ziploc-type bags, or blue ice must be included with each cooler shipment so that the contents are maintained at four degrees celsius until receipt at the laboratory. A chain-of-custody record, protected from moisture by enclosure in a ziploc-type bag, must accompany each cooler shipped. The cooler lid should be secured using packing tape around the outside of the cooler.

III. QUALITY ASSURANCE PROCEDURES

1.0 INTRODUCTION

This section of the SAP describes those activities necessary to generate a data set that is defensible, traceable, and usable for decision-making. Chemical data for the NIROP Fridley project will be obtained from:

Field Screening/Characterization of:

- Contents of excavated drums to determine material compatibility.

Off-site Laboratory Analysis of:

- Soil characterization samples following drum excavation (all sites);
- Incidental Soil and Debris and Drum Waste, both bulked and drummed, for disposal; and
- QA/QC samples, as described in the Part II, Sampling and Analysis Plan.

2.0 DATA QUALITY OBJECTIVES

Data Quality Objectives (DQOs) are qualitative and quantitative statements that specify the quality of the data required to support decisions concerning remediation. DQOs are determined based on the end uses of the data and are established prior to data collection. DQOs help to ensure that all data collected are legally and scientifically defensible.

2.1 DATA QUALITY OBJECTIVES PROCESS

The data quality objectives (DQO) process consists of three stages:

- Stage 1: Identify Decision Types
- Stage 2: Identify Data Uses/Needs
- Stage 3: Design Data Collection Program

Stage 1 of the DQO process defines the types of decision that will be made by identifying data users, evaluating available data, developing a conceptual model, and specifying objectives for the project. Identified data users include federal, state and local (if applicable) regulatory agencies, and SOUTHDIV representatives for this project. Evaluation of available data include summarizing the existing data for input to the site conceptual model and using the existing data for design of the additional work envisioned for this facility. The site conceptual model will be developed by utilizing the existing data to formulate hypotheses regarding the nature and extent of contamination, the site-specific fate and transport mechanisms as well as available remedial alternatives. From the developed site conceptual model and the available

remedial alternatives, specific objectives (*i.e.*, performance goals) will be developed for this facility.

Stage 2 of the DQO process identifies the data uses and data needs for this project. The data uses center around three concepts. The first is collection of screening data used to determine which, if any, of the contents of excavated drums may be safely bulked to facilitate ultimate disposition off site. The second data use is waste characterization for identification of disposal options. Finally, the third is collection of data for characterizing subsurface soils that may require remediation at a later date.

Stage 3 of the DQO process involves design of the data collection program. This stage results in analytical method specification, as well as determinations of the quality and quantity of data necessary in order to make the appropriate decisions.

2.2 CHEMICAL DATA QUALITY OBJECTIVES

Field screening methods will be used to ascertain if further excavation is required at each site. Each method provides both quantitative and qualitative data to address this issue.

The analytical laboratory selected for this project must meet, as a minimum, NEESA 20.2-047 B requirements, or equivalent, before samples are submitted for chemical analyses. The laboratory must also be CLP-approved. Table C-3 details the analytical program for this project. In order to establish the uses for which the laboratory data are suitable, the soil data will be collected and analyzed using CLP level QC or NEESA Level D (highest level), and the waste characterization data will be collected and analyzed using NEESA Level E QC. The use of Level D for the soil is mandatory, as NIROP Fridley is listed on the National Priorities List (NPL). The rationale for Level E is that the waste characterization data will have a low probability of litigation. The objectives of the chemical data are to, within the defined uncertainties of the data set, enable decisions regarding contamination extent and satisfy disposal requirements.

2.3 PHYSICAL DATA QUALITY OBJECTIVES

Physical features of the site will be verified (if mapped during previous studies) or determined in the field. Soil sampling locations will be documented on the site map. Locations will be measured from a permanent feature (i.e. buildings, fences).

2.4 ANALYTICAL DATA QUALITY OBJECTIVES

DQOs for analytical data will be defined through assessment of the following:

- Precision - the degree to which a measurement is reproducible, determined by comparison of sample duplicates. Typically precision of 20% is acceptable for

laboratory generated duplicates of either matrix.

- Accuracy - expressed as the percent recovery of a compound from a sample spiked with known concentrations of target compounds for each analytical method. Accuracy for metals analysis typically lies between 75 and 125%, while values for organic are compound specific.

- Completeness - a measure of the amount of valid data obtained from an analytical data set compared with the amount that would be expected to be obtained under normal sampling and analytical conditions. Completeness goals for this project have been established at 95%.

- Comparability - the confidence with which one data set can be compared to another.

- Representativeness - the degree to which data represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition.

Analytical quality assurance objectives are established to ensure the quality of the analytical data produced by the laboratory.

3.0 DATA VALIDATION/VERIFICATION

Data validation is a systematic procedure of reviewing a body of data against a set of established criteria to provide a specified level of assurance of its validity prior to use. Data resulting from offsite chemical analysis will be reviewed at NEESA Analytical Level D (for soil characterization) and Level E (for drum contents and waste characterization). Evaluation of data consistency will involve review of:

- Duplicate field sample analysis

- Instrument calibrations

- Detection limits

- Holding times

- Database entry accuracy

- Data normality outliers

The laboratory will review the data prior to submittal, and provide internal data validation, per internal QA/QC guidelines. MK will review the data submitted and provide validation as defined in **Sampling and Chemical Quality Assurance Requirements for the Navy Installation Restoration Program** (NEESA 20.2-047B).

4.0 LABORATORY ANALYTICAL PROCEDURES

The most current version of "Test Methods for Evaluating Solid Waste Physical/Chemical Methods" and/or "Methods for the Chemical Analyses of Water and Waste, EPA 600.1982" will be used for field screening and waste characterization. "Statement of Work for Organic Analysis" and "Statement of Work for Inorganic Analysis" will be used by the off-site laboratory for the organic and inorganic analysis of soil samples.

4.1 ANALYTICAL METHODOLOGY

The analytical methodology for this project is largely based on utilization of an off-site laboratory. The off-site laboratory will conduct analyses for organic and inorganic parameters as listed in Table C-3. The off-site laboratory is expected to produce NEESA Level D analytical data for soil samples and Level E data for waste characterization. The analytical data will be used for characterizing the subsurface soils and disposal characterization of drummed and bulk wastes.

4.2 SAMPLE CONTAINERS, PRESERVATION AND HOLDING TIMES

All sample containers will be provided by the analytical laboratories. The containers will be cleaned according to EPA protocol and either pre-preserved or the necessary amount of preservative will be provided by the laboratory in a separate container.

All samples collected during the field investigation and submitted to laboratories for chemical analyses will be preserved according to EPA standards. Sample preservation and temperature shall be checked immediately upon receipt of samples at the laboratory. The results of these checks will be recorded on the corresponding chain-of-custody form.

4.3 QUALITY CONTROL SAMPLES

Field blank, field duplicate, equipment rinsate blanks and trip blank samples will be collected in the field as specified in the SAP. Laboratory QC samples will be analyzed, where appropriate, and will include method blanks and sample duplicates. These will be analyzed concurrently with the analytical batch to which they are assigned.

The laboratory method blank is carried through each step of the analytical method to examine the potential for cross-contamination. The laboratory method blank will be analyzed at a rate of 1 per 20 samples or one per analytical batch, whichever is the greater frequency, for all methods.

4.4 METHOD SPECIFIC DATA QUALITY OBJECTIVES

The method specific data quality objectives will be provided in the Quality Assurance

Plan submitted by the approved laboratory performing the chemical analyses on the sample collected for this project.

5.0 QUALITY CONTROL CHECKS

5.1 SAMPLE HANDLING IN THE LABORATORY

Upon receipt, all samples will proceed through an orderly processing sequence (as defined in the laboratory QA/QC Plan) specifically designed to ensure continuous integrity of both the sample and other pertinent information to the analysis.

All samples will be carefully checked and verified for proper chain-of-custody (COC) records, preservation, broken or leaking sample containers, proper label identification, and any associated discrepancies. These items will be documented by use of a laboratory receipt form. If any samples arrive leaking or broken, or the custody seal on the shipment coolers is not intact, the Project Manager and QA/QC Coordinator will be notified of the problem(s) immediately.

If no discrepancies are identified, the sample COC record will be signed, and the samples will subsequently be assigned a unique laboratory identification number by the laboratory for tracking and filing. The laboratory QA system and the use of an internal COC procedure will ensure that the samples are appropriately tracked from storage through the laboratory until the analytical process is complete.

Analytical and procedural information and activities will be documented with the use of Standard Operating Procedures (SOPs), a laboratory data management system, laboratory benchsheets, laboratory notebooks, and orderly project files containing any information pertinent to the analysis or integrity of the results.

The contracted laboratory will provide a written QA/QC program which discusses rules and guidelines to ensure the reliability and validity of all analytical work conducted in their laboratory. Compliance with the QA/QC program is coordinated and monitored by designated laboratory quality assurance personnel.

The laboratory will document, in each data package provided, that both initial and ongoing instrument and analytical QC functions have been met. Corrective action will be initiated on any samples analyzed in non-conformance with the QC criteria.

5.2 METHOD SPECIFIC QUALITY CONTROL

Method quality control checks will be analyzed as outlined in the individual methods for each analysis performed.

6.0 DATA REDUCTION, VALIDATION AND REPORTING

6.1 DATA REDUCTION

The laboratory will perform in-house analytical data reduction and review of chemical analyses under the direction of the laboratory's technical staff, QA Officer, and Project Manager for this project. These individuals are responsible for evaluating the quality of the data and indicating which, if any, data may be listed as "unacceptable" and/or which should be considered potentially unreliable. A report by the personnel assessing data quality will be submitted to the Laboratory Project Manager or designee with every data package prior to transmittal to the client.

Data reduction, review, and reporting by the laboratory will include the following:

- Raw data produced by the analyst are reduced and checked by the analyst following laboratory SOPs and the analytical methodology.
- A data review specialist will independently review the data to check that quality control criteria have been attained.
- Upon acceptance of the data package by the independent reviewer, a report is generated and sent to the Laboratory Project Manager.
- The laboratory QA/QC director or his/her designee randomly reviews, at a minimum, five percent of all project reports produced by the laboratory.
- Data packages will be prepared and submitted to the MK Project Manager on an ongoing basis by the laboratory.

Complete data reduction and reporting procedures will be those specified by the laboratory Quality Assurance Project Plan.

6.2 DATA REPORTING

The specific data items in each analytical data set submitted to MK will include, but will not be limited to, the following items:

- Cover sheet listing the samples included in the report and narrative comments describing problems encountered during analysis;
- Copies of signed COC records;
- Tabulated results of the compounds identified and quantified;

- Analytical results for field blanks, method blanks, surrogate recoveries, initial and continuing calibration forms, verifications of standards and blanks, internal standard data, ICP Interference Check Samples, ICP Serial Dilutions, Method of Standard Additions, and laboratory control samples;

- Calculations of detection (reporting) limits;

- Photocopies of laboratory notebooks relevant to the analytical data set.

7.0 PREVENTIVE MAINTENANCE AND CALIBRATION

The approved laboratory will be responsible for the maintenance of laboratory instruments and equipment. Instruments and measurements made as part of the analytical methodology will be as specified in the method, without modification. The laboratory's QA program ensures that only trained personnel perform routine maintenance on all major instruments and that repairs are performed by trained laboratory personnel or service technicians employed by the instrument manufacturer or representative. Instrument maintenance will be appropriately documented through the use of instrument logs which will be included in the laboratory project file.

8.0 CORRECTIVE MEASURES

When errors, deficiencies or out-of-control situations exist, the laboratory QA program provides systematic procedures, called corrective actions, to resolve problems and restore proper functioning to the analytical system.

The Laboratory Operations Manager or designee will review the data generated to ensure that all quality control samples have been analyzed as specified in the protocol. Where sample results fall outside of the acceptable ranges for accuracy and precision, deficiencies will be reported to MK's QA/QC Coordinator, who will immediately report the discrepancies to the Project Manager. Corrective actions will be defined by the MK Project Quality Manager in conjunction with the Project Manager and documented appropriately.

The laboratory will follow the procedures in the respective method for performing corrective action and reporting the data with qualifiers, if appropriate. MK will evaluate the effect of any deviations in relation to the project Data Quality Objectives. Corrective action may include, but is not necessarily limited to:

- Re-analyzing suspect samples

- Re-sampling and analyzing

- Evaluating and amending sampling and/or analytical procedures

- Accepting data with an acknowledged level of uncertainty

- Discarding the data

9.0 LABORATORY DATA REPORT

Laboratory data reports will be issued for each work order generated by the laboratory. A work order is generated for a single client's samples, received by the laboratory on the same day. The deliverable components of the data report are listed below:

- Case Narrative/Data Flags
- Data Package Checklist
- Sample Delivery Group Worksheet
- Data Report (analyte, method, detection limit, date and time of analysis and results for each sample)
- Method Blank Summary
- Surrogate Recovery Information
- Field and Laboratory Blank Summaries
- Deficient Incident Report
- Dilution Factors
- Chain-of-Custody Records
- Cooler Receipt Forms
- Laboratory Sample Preparation Data Sheets
- Extraction/Digestion Logs

As appropriate, each of these deliverable components are given for each of the types of analyses that are conducted.

10.0 QUALITY ASSURANCE PROGRAM

10.1 SYSTEM AUDITS

System audit(s) may be performed by the MK Project Quality Manager (PQM) or designee during the course of the field activities. Evaluations will be made of ongoing field work, as well as any other activity affecting the quality. The primary purpose of the system audit is to verify and document that field activities are being performed efficiently and in conformance with approved standards and procedures, federal and state regulatory requirements, sound engineering and environmental practices, and contract requirements.

The audits will include: an objective examination of work areas, activities, and processes; review of documents and records; interviews with project personnel; and review of procedures associated with the project. Audit results will be documented and the audit report submitted to the Project Manager for action. The Project Manager will investigate any adverse audit findings, determine the root cause (if necessary), schedule corrective action, and respond in writing to the report as requested. The Project Manager will report periodically on the status of corrective actions taken, until all required actions are completed.

10.2 SURVEILLANCES

Quality assurance surveillances will be performed as necessary, using performance-based concepts for monitoring and/or observing activities, to verify conformance to specified program requirements. Surveillances are considered to be snap-shots of compliance during a given time and generally focus on one specific area of review, rather than entire program effectiveness. Surveillances will be conducted at the discretion of the PQM and may be initiated when the quality of an activity appears to be in jeopardy due to noncompliance with the applicable project plans; an overview less formal than an audit is desirable; or formal audits of an activity, project subcontractor, etc., may not be required.

10.3 LABORATORY EVALUATION

Any laboratory performing chemical analysis will provide a list of certifications and approvals for review. MK will utilize a laboratory which has previously performed or are currently performing work in support of the Navy's Installation Restoration Program (IRP) per NEESA and has been approved for CLP (Contract Laboratory Program) work. As an alternate to previous NEESA approval, MK may utilize a laboratory which has undergone successful reviews by other DOD agencies, including: AFCEE (Air Force Center for Environmental Excellence) Installation Restoration Program U.S. Air Force; DERP (Defense Environmental Restoration Program) U.S. Army Corps of Engineers; and/or MRD (Missouri River Division) U.S. Army Corps of Engineers. Other relevant federal agency reviews or approvals other than those listed may be considered, but require Contracting Officer approval.o

The PQM will assure that the laboratory has a current validation for all analyses and matrices specific to this project. MK will obtain a copy of the laboratory's Quality Assurance Plan and evaluate its experience, capability, and adequacy prior to sending of samples. This evaluation will be conducted and retained in project files.

10.4 CORRECTIVE ACTION PROGRAM

A corrective action program will be implemented to ensure that conditions adverse to quality are identified promptly and corrected as soon as practical. In the case of significant conditions adverse to quality, the root cause of the condition will be determined, and corrective action taken to preclude reoccurrence. These actions will be documented and reported to appropriate levels of management.

Corrective actions may be the result of internal audits and surveillances or when laboratory analytical results appear unusual, questionable, or quality control criteria are exceeded. When quality control criteria are exceeded, information justifying poor recovery or precision will be requested from the laboratory and documented. Follow-up action will be taken to verify implementation of all corrective actions.

10.4.1 Reporting and Resolution of Quality Problems

Significant quality problems and conditions will be identified, reported and corrected in accordance with the following requirements:

- Existing, developing, or potentially out-of-control quality conditions will be promptly reported to the Project Manager for evaluation and action. These reports will include identification of the problems and corrective actions taken.

- Reports documenting quality problems and their resolution, including lessons learned from significant quality problems and adverse conditions, will be routinely disseminated to all affected project personnel.

10.4.2 Laboratory Corrective Action

The MK Analytical Chemistry Manager or designee will review the data generated to ensure that all quality control samples have been analyzed as specified in the methods. This review will include calibration procedures, frequency, and results. Instrument maintenance logs also may be checked. Recoveries of laboratory matrix spike/matrix spike duplicate samples and surrogates will be checked for consistency with method accuracy. RPDs of laboratory matrix spike/matrix spike duplicates will be checked for consistency with method precision. Where sample results fall outside of the acceptable ranges for accuracy and precision as given in individual methods, discrepancies will be reported immediately to the Project Manager. Corrective actions will be defined by the Analytical Chemistry Manager in conjunction with the Project Manager and documented appropriately.

The contracted laboratory will have an internal quality assurance corrective action program which includes verification that QC data are not outside acceptable windows for precision and accuracy, blanks or control samples do not contain contaminants above acceptable levels, undesirable trends detected in spike recoveries or RPDs between duplicates are corrected, there are no unusual changes in detection limits, and holding times have not been exceeded. If deficiencies are identified by the laboratory QA department during internal or external audits, or from results of performance evaluation samples, actions will be taken as previously described in Section 8.0

10.4.3 Recurring Conditions Adverse to Quality

For recurring quality problems where corrective actions have not been effective, the Project Manager, as needed, will do the following:

- Determine the events leading to the occurrence of the quality problems
- Develop an understanding of the technical and work activities associated with the quality problems
- Ascertain the implications of the quality problem
- Determine the extent to which similar quality problems (or precursors to the problems) have been recognized by the responsible task manager, the effectiveness of any corrective actions that were taken, and impacts on completed work
- Consider stopping work associated with the applicable activity
- Recommend actions that can be taken by the responsible task manager to preclude recurrence

TABLE C-1. SUMMARY OF DATA COLLECTION ACTIVITIES.			
Activity	**Methods/Equipment Used**	**Data Collected**	**Data Use/Objectives**
Field Screening - unopened drums	-Combustible Gas Indicator (CGI) -Organic Vapor Monitor (OVM) -Draeger Tubes -Visual Observation	-Presence of explosive atmospheres -Concentration of organic vapors -Evidence of leakage, bulging or deterioration -Symbols or other marking identifying drum contents	-Health and Safety Monitoring -Determine method of opening drum -Initial characterization data
Field Screening - opened drums	-Combustible Gas Indicator (CGI) -Organic Vapor Monitor (OVM) -Draeger Tubes -Visual Observation	-Presence of explosive atmospheres -Concentration of organic vapors -Color, viscosity, amount in drum -Air reactivity (foaming, bubbling, etc.)	-Health and Safety Monitoring -Determine if < 1 inch of material in drum (may be considered "empty" and non-regulated by State RCRA, see Section 4.0 of this document) -Initial data for mobile laboratory (need for dilution?) -Information for drum labels
Drum Sampling	-OVM, Draeger Tubes -wrenches, non-sparking equipment for lid removal -trier, sludge judge, coliwasa, dipper, or equivalent	-Drum samples for field characterization -Organic vapor presence in samples	-Initial data for mobile laboratory (need for dilution?) -Representative samples for mobile lab characterization
Sample Characterization by Mobile Laboratory	-Field Screening Tests	-Acidic/Caustic (pH) -Air/ Water reactivity -Water Bath Organic Vapor Emissions -Combustibility/Flammability -Presence of PCBs/halides -Presence of inorganics/organics -Presence of alcohol/aldehyde -Presence of cyanide -Presence of oxidizers	-Compatibility of drum contents for bulking -Preliminary (field) data for disposal -Guidance in defining hazardous waste characteristic parameters (combine with guidance from disposal facility)

TABLE C-1. SUMMARY OF DATA COLLECTION ACTIVITIES.

Activity	Methods/Equipment Used	Data Collected	Data Use/Objectives
Sampling for disposal parameters (after bulking)	-trier, sludge judge, coliwasa, dipper, ponar dredge or equivalent -stainless steel bowls, spoons, trowels for compositing	-Bulk container samples for disposal characterization	-Meet requirements of disposal/receiving facility -Proper documentation of drum contents and labeling -Proper naming and disposition of waste as defined by RCRA and CERCLA
Soil Sampling (drum excavation area/stockpiles/rolloffs) and Debris Sampling (disposal)	-hand auger, stainless steel bowls, spoons, trowels -sample location map (gridded excavation areas) -measurement location equipment -OVM	-Presence of organic vapors in excavation or in samples -Measured locations with respect to permanent features -Samples for offsite laboratory analysis	-Health and Safety Monitoring -Initial soil data to assist future remedial or characterization efforts (excavation area) -Determine if residual contamination exists from drum burial -Disposal Characterization of incidental debris and soil removed
Water Sampling (for disposal of infiltrated water)	-bulk containers (i.e. Baker tanks) -disposable bailer or peristaltic pump -OVM	-Presence of organic vapor in tank, above fluid line -Visual characteristics of water removed from excavation	-Disposal characterization -Proper disposition of water
QA/QC Samples	-Trip blanks (provided by laboratory) -Analyte-free water (provided by laboratory) -Decontaminated equipment -Source water for decontamination procedures	-Presence and concentration of residual organic contamination introduced during shipment -analytical data for duplicate sample -analytical data for rinsate -analytical data for water used during decontamination	-Properly qualify sample organic data based on trip blank results -Measure and document analytical precision of the laboratory -Measure effectiveness of decontamination procedures -Measure purity of analyte-free water and other water sources used during decontamination

Table C-2. Field Equipment List (Master)

Category/item	Quantity	Collected	Category/item	Quantity	Collected
Soil Sampling			**Miscellaneous**		
small stainless steel spoons			sample containers from lab		
large stainless steel spoons or trowels			trip blanks from lab		
stainless steel bowls			sample refrigerator		
grey tape			large garbage bags		
shovel			scissors		
hand auger and attachments			tools (pliers, wrenches)		
drums for cuttings and sample wastes			steel tape/measuring tape		
aluminum foil			ruler		
drive samplers and brass sleeves			stopwatch		
Drum/tank Contents			5.5 gallon bucket		
drum thieves			camera and film		
coliwasas			surveyor tape		
disposable bailers			cellular phone/2-way radio		
stainless steel bailer			extra batteries for meters		
weighted bottle sampler			paper towels		
pinpoint sampler			clear plastic cups		
peristaltic pump and tubing					
car battery (power for pump if needed)			**Sample Shipping**		
flow regulator (valve)			coolers from lab		
extra bottle preservative			ice		
pH paper			Ziploc freezer bags (gallon and quart)		
non-sparking drum wrench			bubble wrap		
			strapping tape		
Decontamination			clear tape		
distilled water			thermometer, if requested by lab		
analyte free water (from lab)			fed ex airbills and envelopes		
10% nitric acid solution (from lab)					
acetone solution (from lab)			**Documentation**		
isopropanol solution (from lab)			field logbook or diary		
15-gallon tubs			sharpies		
brushes			sample labels		
pipe cleaner brushes			sample seals (CLP)		
Alconox, or equiv. non-phos. detergent			custody seals		
spray bottles			sample logbook		
chemical rinse tub			soil logging guidelines		
			Chemical Data Acquisition Plan		
			map of sampling locations		
			Site Safety and Health Plan		
			digging permits		
			Quality Control Plan		
			hot work permit (if req'd)		

Table C-2. Field Equipment List

Category/item	Quantity	Collected	Category/item	Quantity	Collected
Health and Safety			**Health and Safety**		
(rentals)			**(consumables)**		
OVM, FID or PID			CPR Pocket Masks		
Combustible Gas Indicator (CGI)			Dual station/eyewash station		
Isobutylene or other cal gas (PID)			Moist towelettes		
Methane (FID, CGI)			UL listed hazardous locations		
regulator (ask rental place)			Smoke Alarms		
Dust Monitor (mini-ram)			**(support documents)**		
Draeger tubes and handpump			copy of MK Safety manual		
(consumables)			(SouthDiv specific)		
Kimwipes (medium/large)			Copy of MK Industrial Hy-		
Respirators (note size)			giene Procedures Manual		
Chemical cartridges			Copy of MK Safety and		
HEPA cartridges			Health Program Desc. for		
Cleaner/sanitizer for respirators			Haz. Waste Site Operations		
PPE Covering Size:_____:			Copy of MK Accident Prev.		
Type:_____Size:_____:			Plan for SouthDiv Contract		
PPE gloves; Size:____Type:____			OSHA posters/ 2 OSHA		
PPE foot protection Size:_____:			200 forms		
Foam earplugs			Tool Box Talks (orange book)		
Safety Glasses			EM 85-1-1 Corps Safety Man.		
Silver cloth duct tape			Signed off SSHP/Work Plan		
Personal first aid kit			MK Accident Data Report		
Reflective safety vests			Form # 678/91		
Yellow "Caution" tape			MK Supervisor Accident In-		
PID Lamp Cleaner bottles			vestigation Report Form #		
Two 10-foot tygon tubing:			CAS 24/77		
10 feet - 0.25 inch I.D.			MK Daily Logbook Report		
10 feet - 0.125 inch I.D.			from SSHP		
Two 20lb. ABC dry chemical fire			MK Weekly Inspection		
extinguishers			Checklist forms from SSHP		
Bloodborne pathogen kits			PMO project procedures:		
			PHSP 001.1, 002.1, 003.1,		
			004.1, 005.1		
			Hardhats		
			29 CFR 1910, 29 CFR 1926		

Notes:

1. A checkmark is placed under the column "Collected" once the item is inventoried at the site.
2. The above list should be reviewed carefully, prior to work beginning, to make sure all necessary items are accounted for.

TABLE C-3
DATA COLLECTION LOCATIONS

Medium	Test Parameters	Number of Samples or Locations	QA/QC Samples[1]				Purpose
			TB[2]	ERB[3]	FD[4]	FB	
Field Measurements							
Field Screening of drums (outside and inside)	residual organic vapor, presence of explosive atmospheres	per drum (assume 50 for estimating)	N/A	N/A	N/A	N/A	Initial screening data to support health and safety requirements and characterize drums
Drum Contents	hazardous category/ compatibility criteria	per drum (assume 50 for estimating)	N/A	N/A	1 per 10 drums	N/A	Compatibility of drum contents for bulking; preliminary data for disposal characterization
Analytical (offsite) laboratory testing							
Base of Excavation Soil	select VOCs[6], select SVOCs[7], select metals[9], total cyanide, phenolics, sulfur, and total organic halogens	TBD (assume 26 for estimating)	7	5	3	1	Confirmation Sampling
Hazardous Soil	paint filter, ignitability, corrosivity, reactivity, TCLP-VOCs, TCLP-SVOCs, TCLP-metals, TCLP-pesticides	TBD (assume 3 for estimating)	0	1	0	1	Disposal characterization[5]
Stockpiled Soil (and debris)	select VOCs[6], select SVOCs[7], select metals[9], total cyanide, phenolics, sulfur, and total organic halogens	TBD (assume 23 for estimating)	7	5	2	1	Determine suitability for use as backfill[8]

TABLE C-3
DATA COLLECTION LOCATIONS

Medium	Test Parameters	Number of Samples or Locations	QA/QC Samples[1]				Purpose
			TB[2]	ERB[3]	FD[4]	FB	
Bulked Drum Contents: solids/sludges	Paint filter, ignitability, corrosivity, reactivity, TCLP-VOCs, TCLP-SVOCs, TCLP-metals, TCLP-pesticides	TBD (assume 12 for estimating)	0	2	1	0	Disposal Characterization[5]
Bulked Drum Contents: liquids	Ignitability, corrosivity, reactivity, VOCs (TCL), SVOCs (TCL), pesticides, RCRA metals	TBD (assume 4 for estimating)	0	0	1	0	Disposal Characterization[5]
Drummed oil	Btu, total chlorine, PCBs, fuel fingerprint (diesel range, gasoline range and total chromatographical organics), and ignitability	TBD (assume 2 for estimating)	0	0	1	0	Disposal characterization[5]
Decontamination water, incidental water in excavation	VOCs (method to be determined; either EPA 8021, EPA 601/602 or 8010/8020), cadmium, chromium, copper, cyanide, lead, mercury, nickel, zinc, pH, total petroleum hydrocarbons, total suspended solids, chemical oxygen demand	TBD (assume 3 for estimating)	1	0	1	1	Determine if acceptance criteria have been met (see Table C-6)

TABLE C-3
DATA COLLECTION LOCATIONS

Medium	Test Parameters	Number of Samples or Locations	QA/QC Samples[1]				Purpose
			TB[2]	ERB[3]	FD[4]	FB	

Notes:
TBD = to be determined (estimated totals are subject to change +/- 100%)
[1]QA/QC samples include trip blank (TB), equipment rinsate blanks (ERB), field duplicate (FD) and field blank (FB).
[2]Trip blanks will be analyzed for VOCs only.
[3]Rinsate blanks will be collected following completion of decontamination procedures. Blanks will be analyzed for associated parameters sampled for that day. N/A = not applicable
[4]Field duplicates will be collected at a rate of 1 per 20 (or less) samples collected for disposal characterization samples. Field duplicate samples will be collected at the rate of one in ten samples for excavation base and stockpile samples.
[5]Disposal parameters will be finalized pending discussion with the disposal facility.
[6]VOCs will include toluene, ethylbenzene, 1,1-dichloroethane, 1,1-dichloroethene, total 1,2-dichloroethene, 1,1,1-trichloroethane, trichloroethene, and tetrachloroethene.
[7]SVOCs will include carbazole, benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-c,d)pyrene.
[8]Screening levels in Table C-5 will be used to evaluate the suitability of excavated soil for use as backfill.
[9]Select metals include antimony, barium, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc.

TABLE C-4
SUMMARY OF ANALYTICAL METHODS

Analyte	Analytical Method	Sample Container	Preservation	Holding Time
Water Samples (blanks)				
Volatile Organics[5]	CLP SOW for organics[2]	3 40-mL glass vials	HCL to pH < 2, Ice to 4°C	10 days
Semivolatile Organic Compounds (SVOCs)[6]	CLP SOW for organics[2]	2 1-liter amber glass jar	Ice to 4°C	Extract in 5 days after receipt
Total Organic Halogens	9020A	1 500-mL glass jar	H_2SO_4 to pH < 2; Ice to 4°C	28 days
Phenolics	9066	1 1-liter amber glass jar	H_2SO_4 to pH < 2; Ice to 4°C	28 days
Select Metals[8]	6010A, 7471 (mercury)	1 1-liter plastic; 1 500-mL plastic (mercury)	HNO_3 to pH < 2, Ice to 4°C	28 days (mercury)1 80 days for other metals
Total Cyanide	9012	1 500-mL plastic	NaOH to pH > 12, Ice to 4°C	14 days
Sulfur	ASTM D-129-64	1 100-mL plastic	N/A	N/A
Water Samples for Sanitary Sewer Discharge (incidental water, decontamination water, etc.)				
Volatile Organics	8010/8020, 8021, or 601/602	3 40-mL glass vials	HCL to pH <2, Ice to 4°C	14 days

TABLE C-4
SUMMARY OF ANALYTICAL METHODS

Analyte	Analytical Method	Sample Container	Preservation	Holding Time
pH	EPA 150.1	1 50-ml plastic	Ice to 4°C	ASAP[3]
Total Petroleum Hydrocarbons	EPA 418.1	2 1-liter amber glass jars	H_2SO_4 to pH < 2; Ice to 4°C	28 days
Metals: chromium, mercury, cadmium, copper, lead, nickel and/or zinc	6010A, 7470 (mercury)	1 1-liter plastic; 1 500-mL plastic (mercury)	HNO_3 to pH <2; Ice to 4°C	mercury: 28 days all others: 180 days
Cyanide (Total)	9012	1 500-mL plastic	Ice to 4°C, NaOH to pH >12	14 days
Total Suspended Solids[7]	EPA 160.2	1 500-mL plastic	Ice to 4°C	7 days
Chemical Oxygen Demand[7]	EPA 410.4	1 100-mL plastic	H_2SO_4 to pH <2, Ice to 4°C	28 days
Water Samples - Additional Analyses Required for Disposal				
Ignitability	1010	1 1-liter plastic	None	ASAP[3]
Corrosivity-pH	9040B	1 1-liter plastic	Ice to 4°C	ASAP[3]
Sulfide Reactivity	SW-846 Methods: Volume C, Section 7.3.4.1	1 1-liter plastic	Ice to 4°C	7 days

TABLE C-4
SUMMARY OF ANALYTICAL METHODS

Analyte	Analytical Method	Sample Container	Preservation	Holding Time
Cyanide Reactivity	SW-846 Methods: Volume C, Section 7.3.3.2	1 1-liter plastic	Ice to 4°C	14 days
Soil Testing: Stockpiles (suitability for use as backfill) and Excavation Base (confirmatory)				
Volatile Organics[5]	CLP SOW for organics[2]	1 4-ounce glass jar	Ice to 4°C	10 days
Semivolatile Organics[6]	CLP SOW for organics[2]	1 8-ounce glass jar	Ice to 4°C	10 days until extraction
Total Organic Halogens	Modified 9020A	1 8-ounce glass jar	Ice to 4°C	N/A
Phenolics	9066	1 8-ounce glass jar	Ice to 4°C	28 days
Select Metals[8]	6010A, 7471 (mercury)	1 8-ounce glass jar	Ice to 4°C	28 days (mercury)1 80 days for all other metals
Total Cyanide	9012	1 8-ounce glass jar	Ice to 4°C	14 days
Sulfur	ASTM D-129-64	1 8-ounce glass jar	N/A	N/A

TABLE C-4
SUMMARY OF ANALYTICAL METHODS

Analyte	Analytical Method	Sample Container	Preservation	Holding Time
Soil and Drum Solids Disposal Testing				
Paint Filter Test	9095	1 8-ounce glass jar	none	N/A
Ignitability	1010	1 8-ounce glass jar	none	ASAP[3]
Corrosivity-pH	9045C	1 8-ounce glass jar	Ice to 4°C	ASAP[3]
Sulfide Reactivity	SW-846 Methods: Volume C, Section 7.3.4.1	1 8-ounce glass jar	Ice to 4°C	7 days
Cyanide Reactivity	SW-846 Methods: Volume C, Section 7.3.3.2	1 8-ounce glass jar	Ice to 4°C	14 days
TCLP - Organics and extraction (Method 1311)	8240	1 4-ounce glass jar	Ice to 4°C	14 days
	8270	2 8-ounce glass jars	Ice to 4°C	7 days until extraction
	8080A or 8081 (pesticides only)	1 8-ounce glass jar	Ice to 4°C	7 days until extraction
TCLP - inorganics[1]	1311 (extraction), 6010A, 7470A (mercury)	2 8-ounce glass jars	Ice to 4°C	Mercury: 28 days; Metals: 180 days

TABLE C-4
SUMMARY OF ANALYTICAL METHODS

Analyte	Analytical Method	Sample Container	Preservation	Holding Time
Drum Samples (Oil - non-CLP)				
Ignitability	1010	1-250 mL glass	N/A	30 days
BTU	ASTM D-240-76	1-100 mL glass jar	N/A	ASAP[3]
PCBs	8080A or 8081	1 50-mL glass jar	none	7 days
Fuel Fingerprint (DRO, GRO, TCO)	Modified 8015A[4]	1 100-mL glass jar	N/A	7 days
Total Chlorine	ASTM D 808-81	1 4-ounce glass jar	Ice to 4°C	28 days
Drum Samples (Liquids)				
VOCs - TCL	CLP SOW for organics[2]	4 40-mL glass vials	Ice to 4°C	10 days from extraction to analysis
SVOCs - TCL	CLP SOW for organics[2]	1 1-liter amber glass	Ice to 4°C	Extract in 5 days after receipt
Pesticides	8080A or 8081	1 1-liter amber glass	Ice to 4°C	7/40 days

TABLE C-4
SUMMARY OF ANALYTICAL METHODS

Analyte	Analytical Method	Sample Container	Preservation	Holding Time
Ignitability	1010	1 1-liter plastic	N/A	ASAP[3]
Corrosivity - pH	9040B	1 1-liter plastic	N/A	ASAP[3]
Sulfide Reactivity	SW-846 Methods: Volume C, Section 7.3.4.1	1 1-liter plastic	Ice to 4°C	7 days
Cyanide Reactivity	SW-846 Methods: Volume C, Section 7.3.3.2	1 1-liter plastic	Ice to 4°C	14 days
RCRA Metals (arsenic, barium, lead, mercury, chromium, cadmium, selenium and silver)	6010A, 7470 (mercury)	1 1-liter plastic; 1 500-mL plastic for mercury	Ice to 4°C	28 days (mercury)1 80 days for all other metals

Notes:

1. Graphite Furnace methods may be used to meet reporting limits for TCLP.
2. CLP SOW = Contract Laboratory Program Statement of Work. Reference is "Statement of Work for Organic Analysis" USEPA Contract Laboratory Program, Latest version. TCL = Target Compound List
3. "ASAP" indicates the sample must be analyzed as soon as possible. The sample will be shipped the day it is collected. Actual holding times will be provided by the lab.
4. The fuel fingerprint method will include analysis for diesel range organics (DRO), gasoline range organics (GRO), and total chromatographical organics (TCO).
5. VOCs will include toluene, ethylbenzene, trichloroethene, tetrachloroethene, 1,2-Dichloroethene (total), 1,1 Dichloroethene, 1,1,1-Trichloroethane and 1,1 Dichloroethane.
6. SVOCs will include carbazole, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)anthracene, chrysene, dibenzo(ah)anthracene and indeno(1,2,3-cd)pyrene.
7. Total Suspended Solids and Chemical Oxygen Demand may not be required for every water sample. Coordinate required analyses for water discharges with the appropriate base personnel.
8. Select metals include antimony, barium, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc.

TABLE C-5
SCREENING LEVELS FOR SOIL ANALYSES

Compound	Screening Level mg/kg	Compound	Screening Level mg/kg
Volatile Compounds- (CLP SOW)		*Semivolatile Compounds (CLP SOW)*	
Ethylbenzene	7,800[b]	Benzo(a)Anthracene	12[c]
1,1-Dichloroethane	0.08[a]	Benzo(a)pyrene	12[c]
1,1-Dichloroethene	22.6[a]	Benzo(b)fluoranthene	12[c]
Total 1,2-Dichloroethene	780[b]	Benzo(k)fluoranthene	12[c]
1,1,1-Trichloroethane	249.5[a]	Chrysene	12[c]
Tetrachloroethene	802[a]	Dibenzo(ah)anthracene	12[c]
Trichloroethene	1.2[a]	Indeno (1,2,3-cd)pyrene	12[c]
Toluene	16,000[b]	Carbazole	12[c]
Inorganics[d]			
Antimony	31[b]	Nickel	1,600[b]
Barium	5,500[b]	Silver	390[b]
Cadmium	39[b]	Zinc	23,000[b]
Chromium	390[b]	Copper	3,100[e]
Lead	400[b]	Cyanide	1,600[c]
Mercury	23[b]		

Notes:

[a]Value is from the document entitled "Attachment 3 to comments on the October 20, 1994, Letter from RMT Regarding Revisions to MPCA Soil Leaching Model Cleanup Numbers for OU2 Soils at NIROP."
[b]Value is from the USEPA document EPA 540/R-94/101 "Soil Screening Guidance", December, 1994. Values are for a pathway to surface soil (residential ingestion limit).
[c]Per conversation between Elise Allen (MK) and David Douglas (MPCA). Values are in relation to benzo(a) pyrene as an equivalent.
[d]These levels may be changed to background levels, pending discussion with the NAVY and review of data from previous investigations.
[e]Value is from Region III US EPA document entitled, "Risk-Based Concentration Table, July - December 1995," by Roy L. Smith, Ph.D. (residential ingestion limit).

TABLE C-6.
SANITARY SEWER WATER DISCHARGE LIMITATIONS
NIROP FRIDLEY

ANALYTE	STANDARD (mg/L)
Cadmium	2
Chromium - total	8
Copper	6
Cyanide - total	4
Lead	1
Mercury	0.1
Nickel	6
Zinc	8
pH - maximum (units)	11
pH - minimum (units)	5
Single Toxic Organic	3
Total Toxic Organics (total VOCs)	10
Total Hydrocarbons (from petroleum-related discharges)	100

Notes:
1. These standards are listed in the permit entitled, "Industrial Discharge Permit - Special Discharges," Permit No. 2154, Spill Location Code MP-NE-04-FR, issued by the Metropolitan Waste Control Commission.

APPENDIX D
GEOPHYSICAL REPORT

Under Separate Cover