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**SITE-SPECIFIC HEALTH AND SAFETY PLAN
FOR GROUND WATER SAMPLING
AT THE
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT (NIROP)
FRIDLEY, MINNESOTA**

NOVEMBER 1986

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CONTRACT DACA45-86-C-0015/P00001

I hereby certify that this plan, specification,
or report was prepared by me or under my
direct supervision and that I am a duly Regis-
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1. INTRODUCTION

1.1 Background

RMT, Inc., (RMT) has been retained by the U.S. Army Corps of Engineers to conduct a remedial investigation/feasibility study (RI/FS) at the Naval Industrial Reserve Ordnance Plant (NIROP), Fridley, Minnesota. The Scope of Services to be provided by RMT has been modified to include an additional round of ground water sampling. The ground water sampling is planned to be conducted during November, 1986.

This round of ground water sampling will include 34 wells with 12 of the wells located off the NIROP property. Two of the wells have sustained minor damage and will be repaired before the sampling occurs.

The samples will be analyzed for organic compounds, major anions and cations, metals, and cyanide. To date, the primary chemical contaminant of concern with regard to worker exposure is trichloroethylene, based on previous sampling data information supplied to RMT.

1.2 Purpose

The Site-Specific Health and Safety (SSHS) Plan provides the guidelines and procedures for the health and safety of RMT field personnel during ground water sampling at the NIROP site. All RMT personnel entering the site will be required to attend training on the health and safety plan before conducting or observing on-site activities. Specific questions regarding the plan should be addressed to the RMT Health and Safety Coordinator, Christine Hansen, C.I.H.T.

A copy of the plan will be maintained at the site in the sample staging area provided for RMT's use by the U.S. Naval Plant

Representative's office. It will be available for review by RMT personnel and authorized visitors.

1.3 Scope

The SSHS Plan is aimed specifically at protecting workers from reasonably foreseeable health and safety hazards arising from the wastes known to be at the site, and is based upon information provided to RMT by others. This plan is to be followed during the additional round of ground water sampling conducted at the site.

The plan has been developed based on the requirements and guidance contained in the following regulations and guidance documents: Occupational Safety and Health Administration (OSHA) Standards, 29 CFR 1910 and 1926; U.S. Environmental Protection Agency (EPA) "Standard Operating Safety Guides," November, 1984; ER 385-1-92, "Safety and Occupational Health Document Requirements for Hazardous Waste Site Remedial Actions," August 30, 1984; and the U.S. Army Corps of Engineers Scope of Services.

2. FIELD PERSONNEL HEALTH AND SAFETY TRAINING AND MEDICAL SURVEILLANCE

2.1 Health and Safety Training

Prior to the start of activities at the NIROP site, the RMT field personnel will participate in the following health and safety training sessions:

- Site-Specific Health and Safety Plan - The plan will be reviewed and the procedures will be outlined and demonstrated.
- Respiratory Protection - Training follows requirements as specified in 29 CFR 1910.134. This is an annual training requirement and includes a qualitative respirator fit test utilizing the isoamyl acetate test protocol.
- Air Monitoring Equipment - Direct reading air monitoring equipment included in the training session is the HNU Systems, Inc. photoionization detector; Foxboro OVA; Draeger bellows and colorimetric detector tubes; and Exotox combustible gas/hydrogen sulfide/oxygen detector. Training includes principles of operation, calibration, use, limitations, and simple trouble-shooting procedures.

Documentation of attendance in training sessions is maintained by the RMT Personnel and Health and Safety Departments in Madison, Wisconsin.

2.2 Medical Surveillance

RMT field personnel receive an initial physical examination prior to performing their first field assignment, and on an annual basis thereafter. The examination protocol for the yearly physical includes the following:

- health history
- vital signs and physical examination screen
- pulmonary functions
- chest x-ray
- hematology survey
- urinalysis
- heavy metal screen
- blood chemistry screen (SMA-20)
- stool for occult blood

The initial examination includes a maximal stress treadmill exercise test with 12-point lead EKG, audiometry, and vision screening, in addition to the above annual tests.

Field personnel assigned to this sampling round will have completed the required physical examination before entering the site to conduct ground water sampling.

3. HAZARD EVALUATION

3.1 Chemical Hazards

The U.S. Army Corps of Engineers has provided data from ground water sampling conducted previously at the NIROP site. Detectable concentrations of metals and organic compounds have been measured in previous samples. Measurable concentrations of trichloroethylene have been detected in many of the wells sampled.

3.1.1 Organic Compounds

The organic compounds detected in previous water and soil samples pose a potential health hazard through inhalation. Organic compounds such as benzene may also be absorbed through the skin. The chemicals chloroform and benzene have been previously detected in certain monitoring wells. These compounds are known or suspected carcinogens.

Organic compounds that have been detected include the following:

	<u>OSHA Permissible Exposure Limit</u>	<u>ACGIH Threshold Limit Value</u>	<u>Vapor Pressure</u>
Toluene	200 ppm	100 ppm	22 mm
Methylene Chloride	500 ppm	100 ppm	476 mm
Chloroform	50 ppm	10 ppm	160 mm
Benzene	10 ppm	10 ppm	75 mm
1,1,1 Trichloroethane	350 ppm	350 ppm	100 mm
1,1 Dichloroethane	100 ppm	200 ppm	182 mm
Trichloroethylene	100 ppm	50 ppm	58 mm

The primary potential routes of exposure for personnel performing ground water sampling at the site would be the inhalation of vapors, skin contact with contaminated liquids, or accidental ingestion from contact with contaminated liquids.

3.1.2 Metals

The metals previously detected in ground water and soil samples at the NIROP site have varying degrees of toxicity based on chronic exposures. At the concentration levels measured, acute exposures are unlikely to result in toxic effects.

Metals that have been detected in previous sampling rounds include the following:

	<u>OSHA Permissible Exposure Limit</u>	<u>ACGIH Threshold Limit Value</u>
Arsenic	.01 mg/M ³	.2 mg/M ³
Cadmium	.2 mg/M ³	.05 mg/M ³
Chromium	1 - .5 mg/M ³	.5 - .05 mg/M ³
Copper	1 mg/M ³	.5 - .05 mg/M ³
Lead	.05 mg/M ³	1 mg/M ³
Nickel	1 mg/M ³	.1 - 1 mg/M ³
Zinc	5 mg/M ³	5 mg/M ³

The potential route of exposure for field personnel would be accidental ingestion from contact with contaminated liquids.

3.2 Physical Hazards

3.2.1 Temperature Extremes

The ground water sampling is expected to be completed in November, 1986. During this time period, the normal ambient temperatures are expected to be moderate, and it is not anticipated that temperature will contribute to undue physical stress.

3.2.2 Utilities

The ground water sampling is to be conducted at established wells. Therefore, locations of overhead and underground electric, gas, and water lines have been determined previously, and are not anticipated to present any physical hazard.

3.2.3 Plant Operations

The monitoring wells to be sampled are all located outside of the NIROP buildings, away from manufacturing and associated operations. The sample staging area to be provided for RMT's use inside the NIROP building is anticipated to be located away from all in-plant activities.

No special safety procedures are anticipated to be required due to plant production activities.

4. AIR MONITORING

4.1 Purpose

Air monitoring will be conducted to ensure that the level of protection is adequate for all phases of the ground water sampling project. Changes in the level of protection will be required if changes in airborne concentrations of contaminants occur.

4.2 Parameters

Total organic vapors and gases will be monitored in the breathing zone during ground water sample collection and during other activities reasonably expected to generate air contamination.

4.3 Monitoring Equipment

The HNU Systems, Inc., model PI-101 photoionization detector (HNU) will be used as the primary instrument for routine monitoring of organic vapor concentrations. The HNU detects organic vapors in air and provides a direct read-out of the organic concentrations as parts per million equivalent to benzene.

The instrument will be calibrated with benzene span gas provided by HNU Systems, Inc., before use.

4.4 Monitoring Schedule

Air monitoring will be conducted at the beginning of the day when the site is entered to establish background air concentrations. Monitoring will be continued throughout the ground water sampling work. The air monitoring will be conducted in the breathing zone of the worker to determine potential exposure levels.

The site personnel performing the air monitoring will have been trained in monitoring procedures by the RMT Health and Safety Department as stated in Section 2.1.

4.5 Establishing Background Levels of Air Contaminants at the Sampling Sites

The proximity of the sampling sites to sources of industrial air emissions may result in air contaminants from the industrial sources affecting the air quality at the sampling sites. The on-site air surveillance program will consider the effects of these other sources of air contaminants migrating to the sampling sites when air quality background levels are established.

Background air concentrations as equivalent parts per million of benzene measured with the HNU shall be established prior to initiating any site activity which requires air monitoring. This background level will be re-established if weather conditions change significantly or if industrial air emissions are significantly affecting sampling site air quality.

4.6 Response to Concentrations of Air Contaminants Above Background Levels

If significant concentrations of organic vapors and gases are detected above background levels, the following guidelines will be used:

- . Background to 1 part per million (ppm) above background - Level D protection will be used.
- . 1 ppm to 5 ppm above background - Level C protection will apply.

- . Greater than 5 ppm above background - Personnel will leave the immediate area and work will be suspended until the concentrations return to levels less than 5 ppm above background. If the levels persist, additional air sampling will be conducted to identify and quantify the air contaminants responsible for the excessive concentrations. After evaluation of the data, the Health and Safety Coordinator may adjust the level of protection required based on the nature and extent of the airborne substances present and the degree of hazard to which on-site personnel may be exposed.

4.7 Documentation

Air monitoring readings will be recorded as field notes with the date, time, location, operation, concentration levels, and any remarks noted. Readings will be recorded of levels prior to the start of sampling background, at the onset of purging - after water is drawn from the well (e.g., after 4 bailers, or 5 minutes after the start of pumping), and if there is any noticeable odor.

5. LEVELS OF PROTECTION

5.1 Levels of Protection for Work Activities

Unless otherwise required, respiratory protection will not be necessary for ground water sampling activities conducted on-site. In general, protective clothing must be worn whenever the potential exists for employees to come in contact with contaminated materials.

Work activities will only be conducted under Level D or Level C as defined by the air monitoring requirements and Section 4.6.

5.1.1 Level D Protection: Background to 1 ppm Above Background

During sampling activities conducted on-site, the field personnel will wear the following protective clothing:

- Work boots
- Eye protection; either splash goggles or a full-face shield
- PVC overboots
- PVC gloves

Respiratory protection, half mask air-purifying respirators with combination organic vapor/HEPA cartridges, will be available to on-site personnel.

5.1.2 Level C Protection: 1 ppm to 5 ppm Above Background

Level C requirements for field personnel protection include the protective clothing specified for Level D plus air-purifying respirators which must be worn when working in Level C.

5.1.3 Level B Protection: Greater than 5 ppm Above Background

Level B protection requires that a self-contained breathing apparatus be used on-site. As stated in Section 4.6, if air contaminant concentrations exceed 5 ppm above background, work will stop.

5.2 Changes in Levels of Protection

The Health and Safety Coordinator may authorize a change in the minimum level of protection required on-site based on an evaluation of actual field conditions, as described below.

5.2.1 Respiratory Protection

New air monitoring data may reveal the presence of concentrations of organic vapors or other air contaminants above acceptable levels for the type of respiratory protection being used. If this occurs, the Health and Safety Coordinator will evaluate the need to modify the level of protection required in a particular area. If changes in the level of protection are warranted, the Health and Safety Coordinator must inform the field personnel of the changes. The Corps' Project Manager will also be notified of this change by telephone.

5.2.2 Protective Clothing

If, during the initial sampling activities, conditions appear to require that coated Tyvek® suits be worn, the Health and Safety Coordinator will evaluate this situation and may modify the personal protective clothing required while conducting the sampling. The Health and Safety Coordinator must inform all affected workers of the changes.

The Corps' Project Manager will also be informed of this change by telephone.

5.3 Work Limitations

- . No smoking will be allowed in the work zones.
- . No eating or drinking will be allowed in the work zones.
- . All field personnel and equipment leaving the work zones must be properly decontaminated prior to leaving the site.
- . A minimum of two persons will be on-site during work activities.

6. SITE CONTROL

6.1 Purpose

The purpose of site control is to minimize the transfer of contaminants from and within the site. Two contamination control methods are 1) establishment of work zones at the site; and 2) decontamination of field personnel and equipment.

6.2 Work Zones

To prevent the spread of contaminants during the course of sampling, the work zones will be delineated as to the exclusion zone, contamination reduction zone, and support zone.

6.2.1 Exclusion Zone

The exclusion zone is the zone where contamination does or could occur. During ground water sampling at the site, the area immediately surrounding each well is considered to be the exclusion zone. All personnel entering this zone must wear the required protective equipment.

Because the potential for exposure to contaminants will occur at each well location, the boundary for each exclusion zone will be defined by the area required to perform the sampling tasks. Field personnel will attempt to minimize this area requirement.

6.2.2 Contamination Reduction Zone

The contamination reduction zone is between the exclusion and support zones. This is a transition between contaminated and clean

zones and serves as a buffer to reduce the probability of the clean zone becoming contaminated.

Decontamination of field personnel and equipment will be done in the contamination reduction zone.

Field personnel will wear the required personal protection while working in the contamination reduction zone. Protective equipment worn in the contamination reduction zone will be removed before entering the support zone.

6.2.3 Support Zone

The support zone is a noncontaminated or clean area. Support equipment (clean protective equipment, supplies, etc.) will be located in this zone. Normal work clothing is appropriate in this zone.

The location of the support zone and any support facilities will be determined at each monitoring well location based on the following factors:

- . wind direction - preferably the support zone should be located upwind of the exclusion zone
- . accessibility
- . support services - electric power supply, roads, drinking water, etc.

6.3 Decontamination Procedures

6.3.1 Field Personnel

Decontamination procedures will be as follows:

- Protective outer garments will be removed and placed in disposable plastic bags at the perimeter of the exclusion zone (see Section 6.2.1 for definition of exclusion zone) each time before leaving the exclusion zone.

- Boots will be removed first and then gloves.
- Field personnel will wash and dry their hands before leaving the contamination reduction zone, and used paper towels will be placed in the disposal bag.
- The plastic bags containing waste materials will be disposed on-site daily in a dumpster designated by the authorized Naval Plant Representative.

Clean outer garments will be kept accessible to field personnel in an area free from potential contamination.

Water, soap, and paper towels will be kept in a clean location adjacent to the work area for both regular clean-up and emergency use.

6.3.2 Equipment

Equipment used in the field will be decontaminated following standard procedures as required by the sampling methodology.

Sampling equipment to be decontaminated includes stainless steel wire leader, bailers, submersible pumps, and any other sampling equipment that may come into contact with ground water.

The equipment will be cleaned with a methanol wash and a distilled water triple rinse.

7. CONTINGENCY PLAN

7.1 Purpose

This contingency plan provides the emergency information needed should there be a sudden, life- or health-threatening action where work activities are being conducted.

The provisions of the contingency plan are to be implemented immediately in the event of a fire, explosion, or accident which could threaten human health or the environment.

7.2 Emergency Contacts

Following is a list of emergency contacts and phone numbers for use in emergency situations occurring during on-site activities:

- . Fridley Police, Fire, and Ambulance 911
- . Unity Medical Center, Fridley 612/780-6845
- . U.S. Naval Plant Representative, NIROP,
Fridley, Mel Vojvodich 612/572-6451
- . U.S. Army Corps of Engineers, Omaha, Nebraska
Project Managers
Tom Thiele 402/341-1118
Janet Wade 402/221-4867
- . RMT, Inc., Office, Madison, Wisconsin
Project Manager - Eric Gredell 608/255-2134
(Office)
608/241-8834
(Home)
Field Technical Supervisor - Cathy Kwiatkowski 608/255-2134
Health and Safety Coordinator - Christine Hansen 608/255-2134

7.3 Emergency Procedures

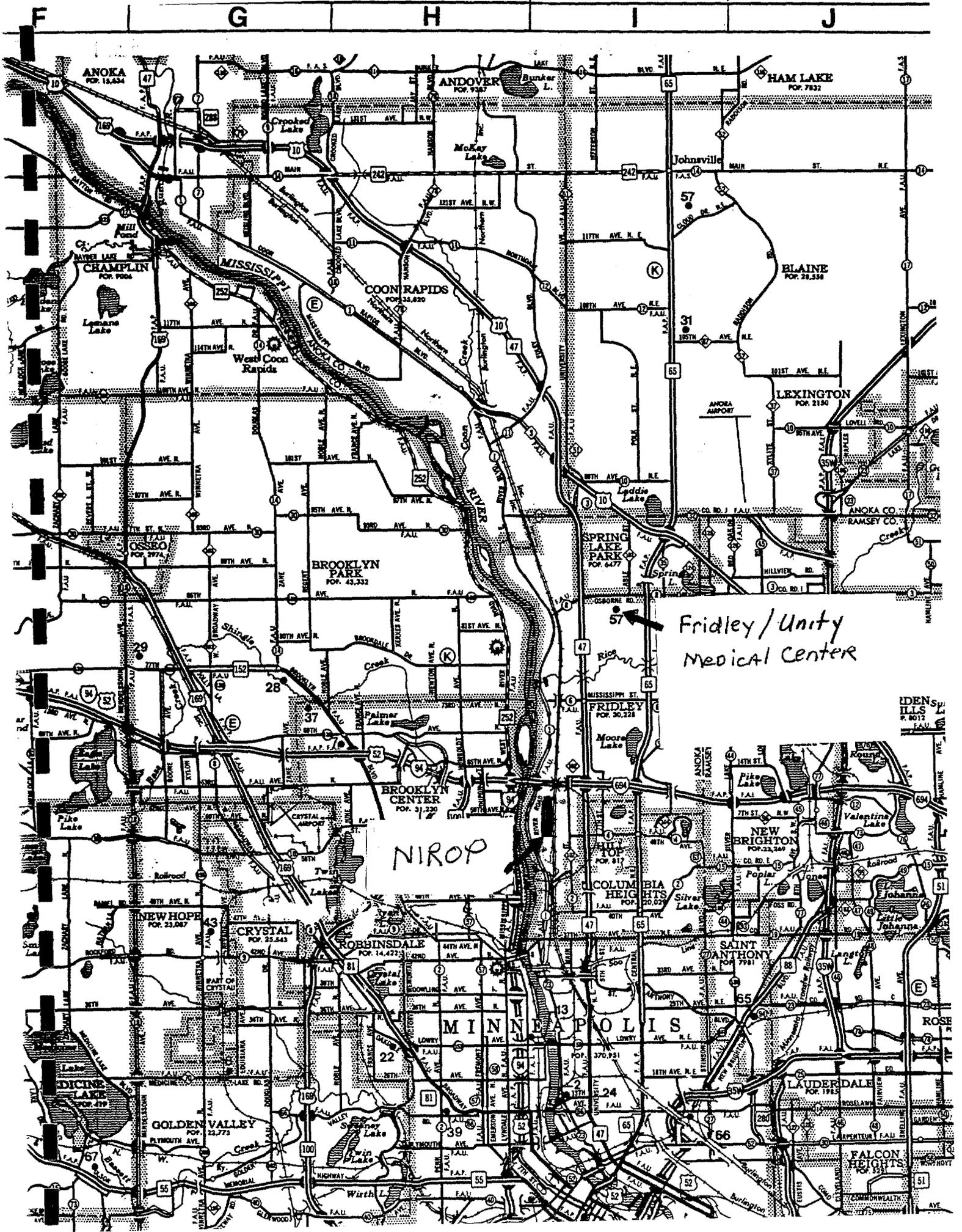
If an emergency situation develops at the site, the discoverer will take the following course of action:

- . Notify the proper emergency services (fire, police, or ambulance) for assistance.
- . Notify any other affected personnel at the site.
- . Contact RMT, the U.S. Naval Plant Representative, and the U.S. Army Corps of Engineers Project Manager to inform them of the incident as soon as possible.
- . Prepare a summary report of the incident for RMT, the U.S. Naval Plant Representative, and the U.S. Army Corps of Engineers.

7.4 Emergency Equipment

Emergency equipment that will be on-site with RMT field personnel will include the following:

- . First aid kit
- . Clean water for emergency wash
- . A map showing the route from the facility to the medical center is included as Figure 1. A copy of the map will be kept in the front seat of the RMT vehicle.



Fridley/Unity
Medical Center

NIROP

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