

**CONTRACT N62470-84-C-6886  
MODIFICATION NO. 1**

**CONFIRMATION STUDY TO DETERMINE EXISTENCE  
AND POSSIBLE MIGRATION OF SPECIFIC CHEMICALS IN-SITU  
AT THE MARINE CORPS AIR STATION  
CHERRY POINT, NORTH CAROLINA**

**PLAN OF ACTION AND MILESTONES,  
SITE OPERATIONS PLAN  
AND  
HEALTH AND SAFETY PLAN**

**ROUND 2 ACTIVITIES**

**PREPARED FOR**

**DEPARTMENT OF THE NAVY  
ATLANTIC DIVISION  
NAVAL FACILITIES ENGINEERING COMMAND  
NORFOLK, VIRGINIA**

**NUS PROJECT NO. 954U.AX06**

**OCTOBER 1985**



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SUBMITTED FOR NUS BY:

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VICKI PIERCE  
PROJECT MANAGER

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DANIEL THRELFALL  
ASSISTANT GENERAL MANAGER

## CONTENTS

<u>SECTION</u>		<u>PAGE</u>
	<b>EXECUTIVE SUMMARY</b>	<b>ES-1</b>
<b>1.0</b>	<b>DRILLING</b>	<b>1-1</b>
<b>2.0</b>	<b>SURVEYING</b>	<b>2-1</b>
<b>3.0</b>	<b>SAMPLING</b>	<b>3-1</b>
<b>4.0</b>	<b>LABORATORY ANALYSIS</b>	<b>4-1</b>
<b>5.0</b>	<b>SLOCUM CREEK DATA</b>	<b>5-1</b>
<b>6.0</b>	<b>REPORTS</b>	<b>6-1</b>
<b>7.0</b>	<b>EXPOSURE ASSESSMENT</b>	<b>7-1</b>
<b>8.0</b>	<b>MILESTONES</b>	<b>8-1</b>
 <b>APPENDICES</b>		
<b>A</b>	<b>DEPARTMENT OF NAVY WORK SCOPE ROUND 2 ACTIVITIES AND EXPOSURE ASSESSMENT OF SURFACE IMPOUNDMENTS</b>	<b>A-1</b>
<b>B</b>	<b>NUS CORPORATION HEALTH AND SAFETY PLAN CHERRY POINT, NORTH CAROLINA MARINE CORPS AIR STATION</b>	<b>B-1</b>
<b>C</b>	<b>ROUND 1 TRIP REPORT JANUARY 6 THROUGH 15, 1985</b>	<b>C-1</b>

## CONTENTS

<u>SECTION</u>		<u>PAGE</u>
1.0	INTRODUCTION	B-1
2.0	TRAINING OF SUBCONTRACTOR	B-2
3.0	PREVIOUS MONITORING/SITE IDENTIFICATION AND HISTORY	B-3
4.0	LEVELS OF PROTECTION/PERSONAL PROTECTIVE EQUIPMENT	B-6
5.0	HEALTH AND SAFETY REQUIREMENTS FOR EACH SITE	B-8
6.0	SUSPECTED SUBSTANCES ON SITE	B-13
7.0	MONITORING PROCEDURES, SITE MONITORING EQUIPMENT, AND METHODS FOR SURVEILLANCE	B-15
8.0	DECONTAMINATION AND DISPOSAL	B-17
9.0	EMERGENCY PROCEDURES AND INFORMATION	B-19
10.0	NUS PERSONNEL AND RESPONSIBILITIES	B-22
11.0	ROUND 1 SAMPLING RESULTS	B-23

## TABLES

<u>NUMBER</u>		<u>PAGE</u>
1-1	DRILLING ACTIVITIES	1-2
2-1	WELLS TO BE SURVEYED	2-2
3-1	SAMPLING PLAN, SITES 1 AND 2	3-2
3-2	SAMPLING PLAN, SITE 4	3-3
3-3	SAMPLING PLAN, SITE 5	3-4
3-4	SAMPLING PLAN, SITE 6	3-5
3-5	SAMPLING PLAN, SITE 7	3-6
3-6	SAMPLING PLAN, SITE 10	3-7
3-7	SAMPLING PLAN, SITE 13	3-9
3-8	SAMPLING PLAN, SITE 15	3-10
3-9	SAMPLING PLAN, SITE 16	3-11
3-10	SAMPLING PLAN, SITE 17	3-12
3-11	SAMPLING PLAN, SITES 19 AND 21	3-13
3-12	CHEMICAL ANALYSIS, ABBREVIATION KEY	3-14
3-13	CONTACT PERSONNEL, SAMPLING	3-15
4-1	SUMMARY, SAMPLE ANALYSIS	4-2
5-1	SLOCUM CREEK STUDY, DATA SUMMARY	5-2
8-1	ROUND 2 SAMPLING & EXPOSURE ASSESSMENT MILESTONE/PERCENT COMPLETE	8-2

## FIGURES

<u>NUMBER</u>		<u>PAGE</u>
1-1	PROPOSED MONITORING WELL LOCATIONS, SITE NOS. 1 & 2	1-3
1-2	PROPOSED MONITORING WELL, SURFACE WATER AND SEDIMENT SAMPLE LOCATIONS, SITE NO. 5	1-4
1-3	PROPOSED MONITORING WELL AND SURFACE WATER SAMPLE LOCATIONS, SITE NOS. 6 & 7	1-5
1-4	PROPOSED MONITORING WELL LOCATIONS, SITE NO. 13	1-6
1-5	PROPOSED MONITORING WELL LOCATIONS, SITE NO. 16	1-7
1-6	PROPOSED MONITORING WELL LOCATIONS SITE NOS. 19 & 21	1-8
3-1	MONITORING WELL LOCATIONS, SITE NOS. 1 & 2	3-16
3-2	MONITORING WELLS, SOIL AND SURFACE WATER SAMPLE LOCATIONS, SITE NO. 4	3-17
3-3	MONITORING WELL, SURFACE WATER AND SEDIMENT SAMPLE LOCATIONS, SITE NO. 5	3-18
3-4	MONITORING WELL, SEDIMENT, AND SURFACE WATER SAMPLE LOCATIONS, SITE NOS. 6 & 7	3-19
3-5	MONITORING WELL LOCATIONS, SITE NO. 10	3-20
3-6	POTABLE WATER WELL LOCATIONS	3-21
3-7	SAMPLE LOCATIONS, SITE NO. 10	3-22

## FIGURES (CONTINUED)

<u>NUMBER</u>		<u>PAGE</u>
3-8	MONITORING WELL LOCATIONS, SITE NO. 13	3-23
3-9	MONITORING WELL, SURFACE WATER AND SEDIMENT SAMPLE LOCATIONS, SITE NO. 15	3-24
3-10	MONITORING WELL LOCATIONS, SITE NO. 16	3-25
3-11	SOIL/SEDIMENT SAMPLE LOCATIONS, SITE NO. 17	3-26
3-12	SAMPLING LOCATIONS, SITE NOS. 19 & 21	3-27

## EXECUTIVE SUMMARY

The Atlantic Division, Department of the Navy, has modified A/E Contract N62470-84-C-6886 (Confirmation Study) to include second-round activities and preparation of an exposure assessment in accordance with the appended (Appendix A) scope of work at the Marine Corps Air Station (MCAS), Cherry Point, North Carolina. The performance of this work and corresponding schedule is discussed in this combined Plan of Action and Milestone Report, Site Operations Plan, and Health and Safety Plan.

Seven work tasks have been identified for Round 2 activities and for completion of the Exposure Assessment. The work tasks are discussed in Sections 1.0 through 7.0 of this report as follows:

<u>Section</u>	<u>Task</u>
1.0	Conduct Drilling
2.0	Conduct Surveying
3.0	Conduct Sampling
4.0	Perform Laboratory Analysis
5.0	Perform Slocum Creek Study Evaluation
6.0	Prepare Reports
7.0	Conduct Exposure Assessment of Surface <u>Impoundments</u>

The schedule of activities/milestones is presented in Section 8.0. The Department of the Navy work scope is shown in Appendix A and the Health and Safety Plan for all Round 2 field activities is shown in Appendix B. The trip report for Round 1 field activities is included in Appendix C.

## 1.0 DRILLING

### Task 1: Conduct Drilling

A total of eight wells will be drilled, as shown in Table 1-1. Seven wells will be installed in accordance with the Department of the Navy work scope (Appendix A). The eighth well (Site 13) is a replacement well, the original of which was destroyed during construction activities. The cost of replacement will be assumed by the contractor responsible for destruction of the original well. The location of each well is shown in Figures 1-1 through 1-6.

The tentative schedule for well completion is also shown in Table 1-1. A description of each new well and rationale for well selection (location and depth) follows.

#### Site Well Number/Description: Rationale

Site 1: 1GW04 - Deep Well (65'): Depth to a potential confining layer is unknown in this location, as determined by a review of historic subsurface investigations and by recent Round 1 drilling efforts. Existing data indicates that a confining layer may exist from 25 feet to 100 feet deep. A deep well is necessary (1) to determine the stratigraphic location of the confining bed and (2) to install a monitoring well at an appropriate depth in order to obtain groundwater samples immediately above the confining bed.

Site 2: 2GW03 - Shallow Well (10'): The existing water table in the vicinity of well Nos. 1GW01 and 2GW02 is less than 5 feet. Contaminants with a specific gravity less than water will be found at the piezometric surface. A well screened in this zone is recommended.

Note: No contaminants were detected in the groundwater samples at sites 1 or 2. The above-recommended wells will aid in verifying the contamination status of these sites.

TABLE 1-1

DRILLING ACTIVITIES  
MCAS, CHERRY POINT, NORTH CAROLINA

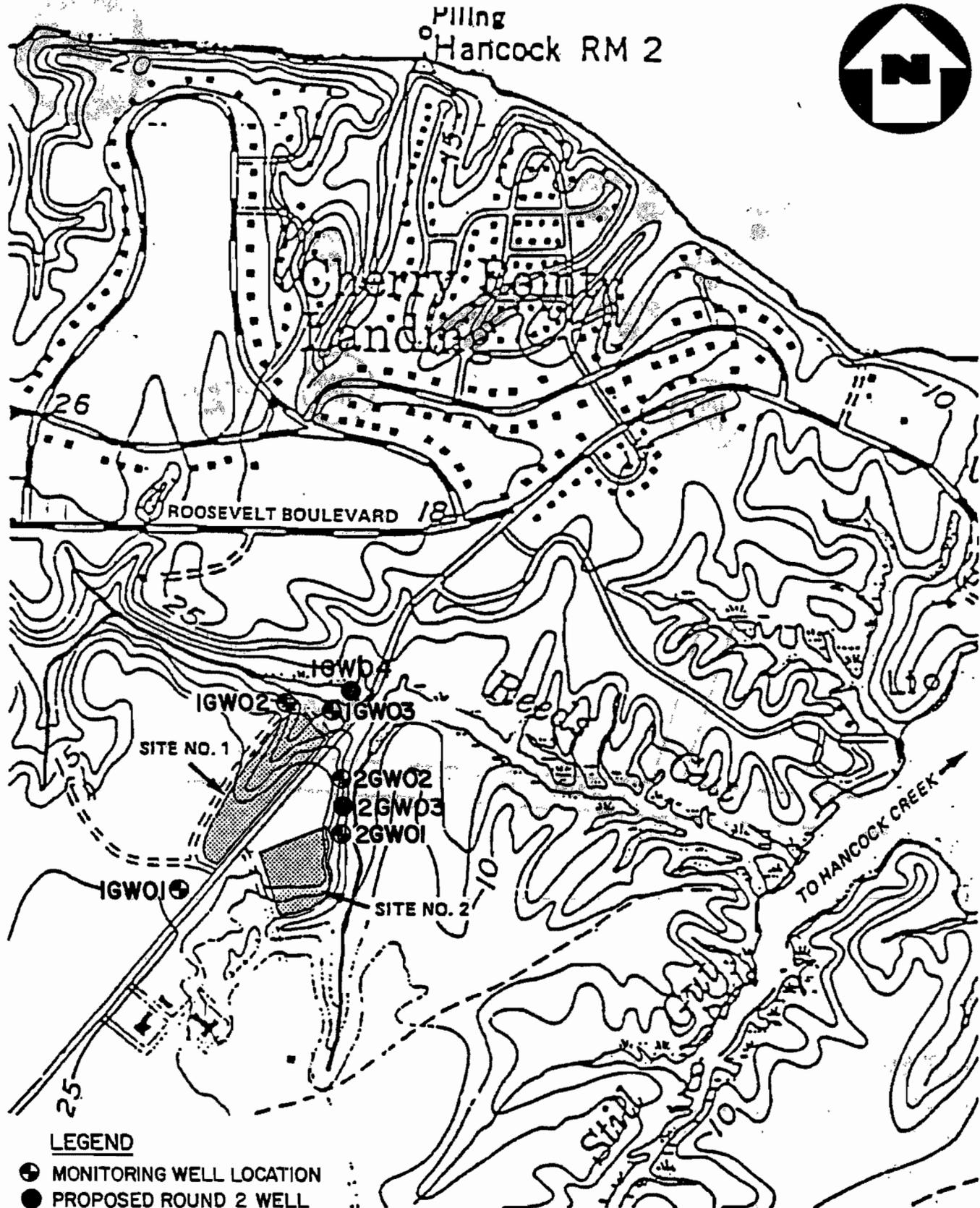
<u>Site</u>	<u>Number</u>	<u>Depth</u>	<u>Scheduled Drilling Date (1985)</u>	<u>Figure Reference</u>
1	1GW04	65'	October 16, Wednesday	1-1
2	2GW03	10'	October 16, Wednesday	1-1
5	5GW07	10'	October 17, Thursday	1-2
7	7GW03	35'	October 15, Tuesday	1-3
13	(1)	25'	October 17, Thursday	1-4
16	16GW05	25'	October 18, Friday	1-5
16	16GW06	25'	October 18, Friday	1-5
19	19GW03(2)	5'	October 19, Saturday	1-6

---

(1) Replacement well (original destroyed during site construction activities)

(2) Coordinate access across runway with MCAS, Cherry Point.

Piling  
Hancock RM 2



**LEGEND**

- ⊕ MONITORING WELL LOCATION
- PROPOSED ROUND 2 WELL

**PROPOSED MONITORING WELL LOCATIONS,  
SITE NOS. 1 & 2**

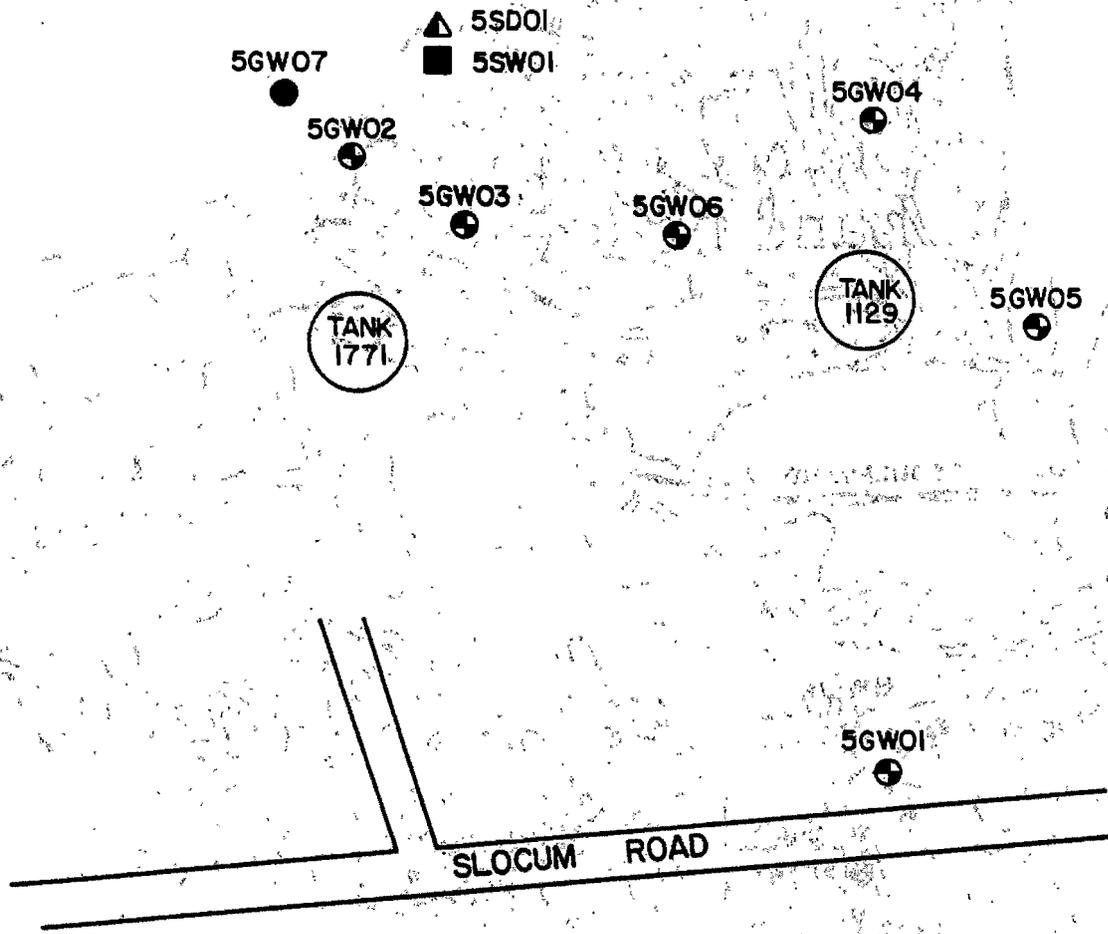
**MCAS CHERRY POINT, NC**

SCALE 1" = 790' ±

FIGURE 1-1



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**LEGEND**

- ⊕ MONITORING WELL LOCATION
- SURFACE WATER SAMPLE LOCATION
- ▲ SEDIMENT SAMPLE LOCATION
- PROPOSED ROUND 2 WELL

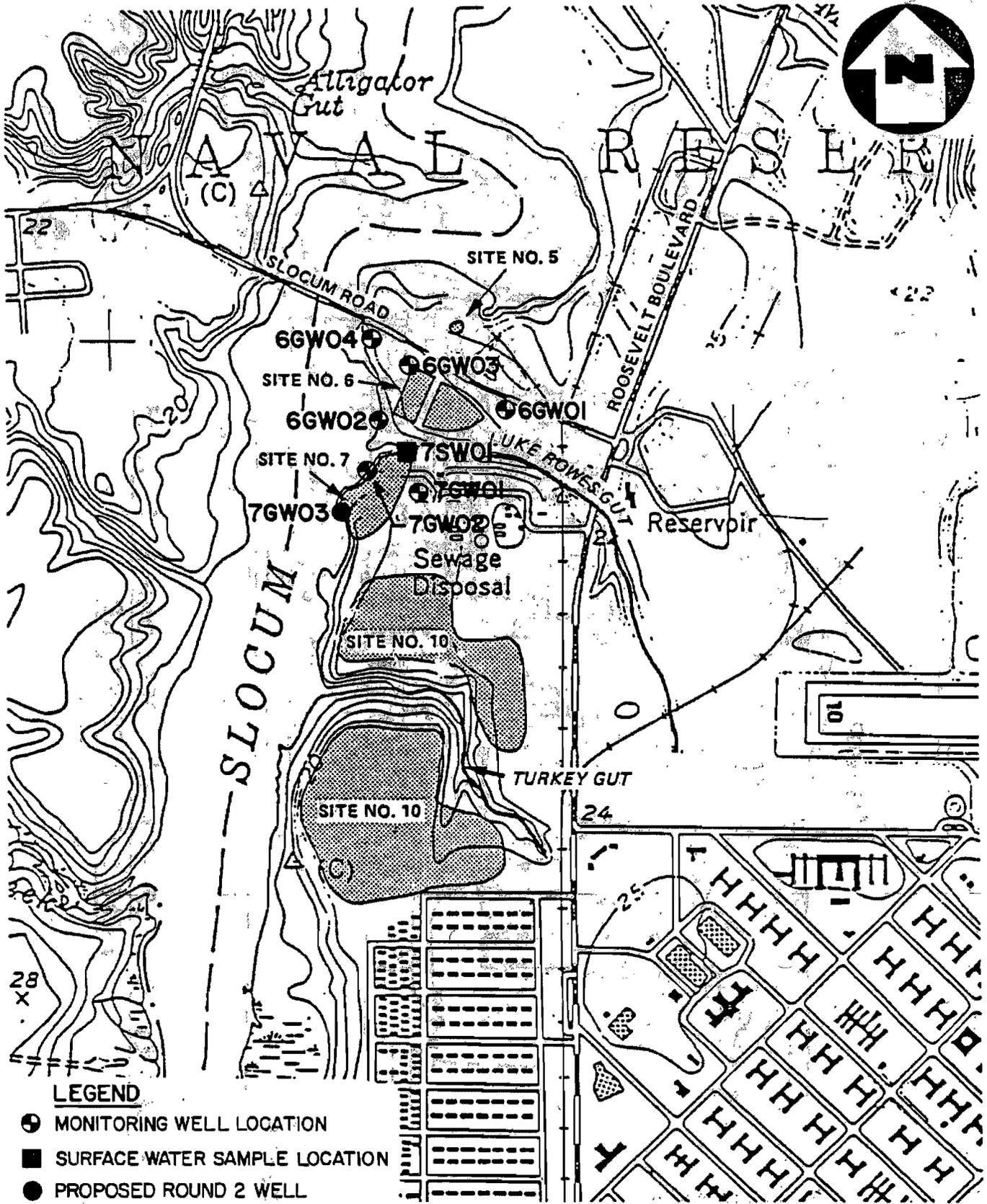
**PROPOSED MONITORING WELL , SURFACE WATER AND SEDIMENT SAMPLE LOCATIONS, SITE NO.5**

**MCAS CHERRY POINT, NC**

SCALE 1" = 150'

FIGURE 1-2





**LEGEND**

- MONITORING WELL LOCATION
- SURFACE WATER SAMPLE LOCATION
- PROPOSED ROUND 2 WELL

**PROPOSED MONITORING WELL AND SURFACE WATER  
SAMPLE LOCATIONS, SITE NOS. 6 & 7  
MCAS CHERRY POINT, NC**

SCALE 1"=1000'

FIGURE 1-3



**LEGEND**  
 ● MONITORING WELL LOCATION

(PCC APRON PAV.T.)

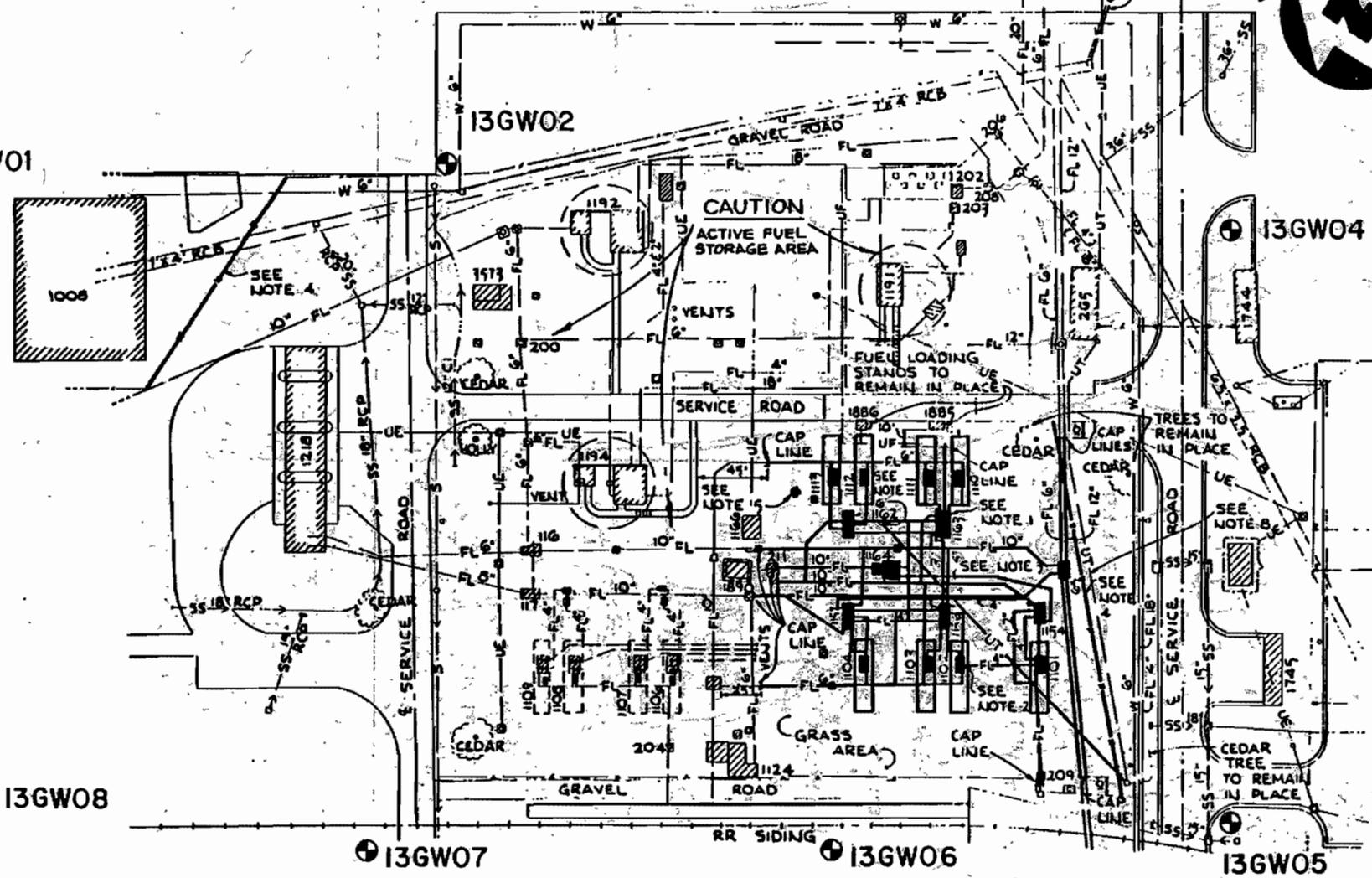
13GW03



13GW01

13GW02

13GW04



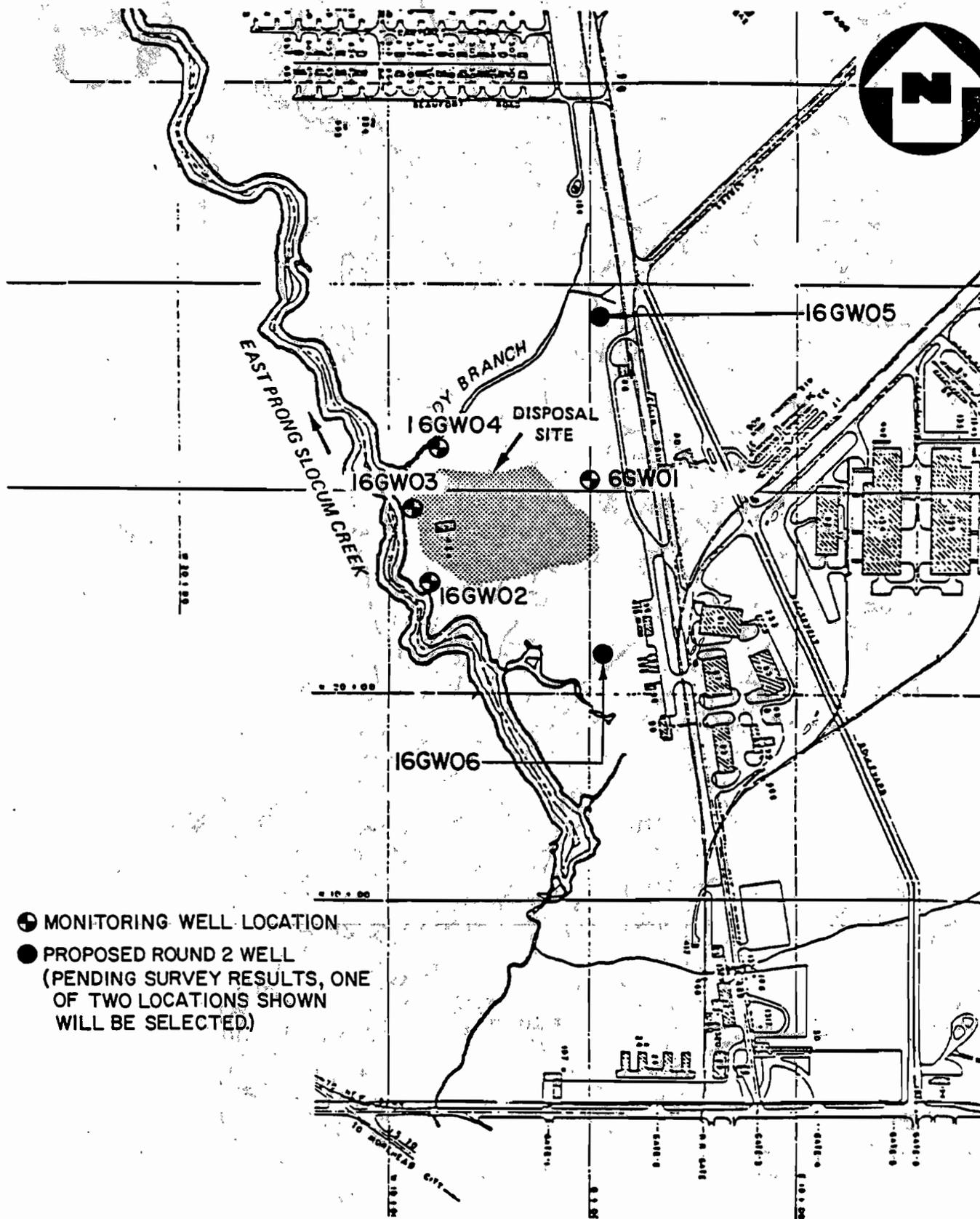
1-6

CP-00348-03.05-10/01/85

**PROPOSED MONITORING WELL LOCATIONS, SITE NO. 13**  
**MCAS CHERRY POINT, NC**  
 SCALE 1"=100'

FIGURE I-4





- ⊕ MONITORING WELL LOCATION
- PROPOSED ROUND 2 WELL  
(PENDING SURVEY RESULTS, ONE OF TWO LOCATIONS SHOWN WILL BE SELECTED.)

**PROPOSED MONITORING WELL LOCATIONS**

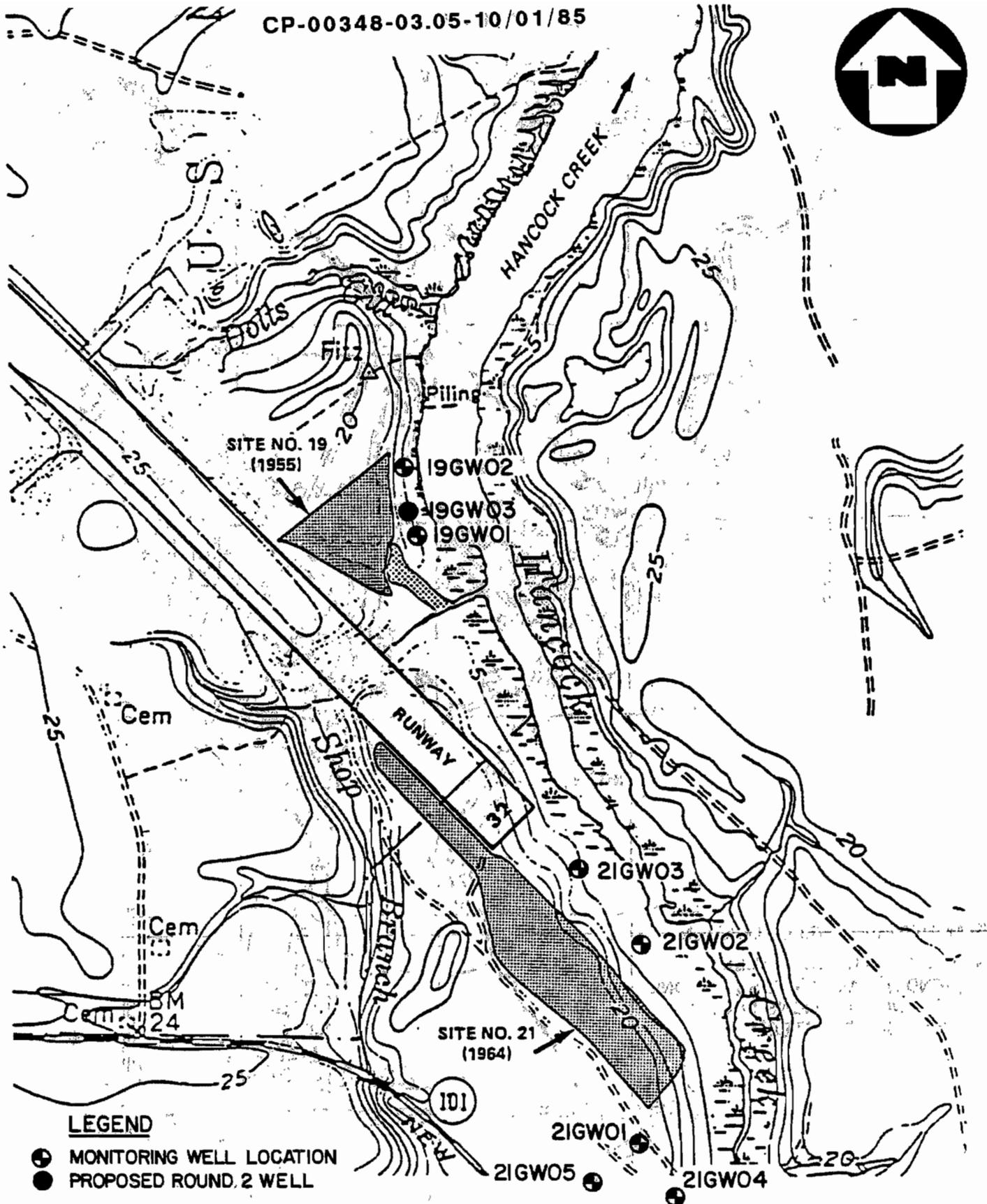
**SITE NO. 16  
MCAS CHERRY POINT, NC**

SCALE 1" = 700' ±

FIGURE I-5



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**PROPOSED MONITORING WELL LOCATIONS**

**FIGURE 1-6**

**SITE NOS. 19 & 21  
MCAS CHERRY POINT, NC**

SCALE 1" = 1000'



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Site 5: 5GW07 - Shallow Well (10'): During drilling, prior to Round 1 sampling, a 5-foot zone of sand banded with petroleum product(s) was intersected between 0 feet and 5 feet. In addition to this, the water table is less than 10 feet - 15 feet deep. It is recommended that a well screened from ground surface to 5 feet to 10 feet be installed. The petroleum product is less dense than water and will be found at the piezometric surface.

Site 7: 7GW03 - Deep Well (35'): Historic data indicates a confining bed at approximately 35 feet. Constituents were detected at the wellhead of the two wells during drilling. Analytical results of groundwater samples taken in these wells did not confirm field results. The historic disposal practices at this site indicate a strong potential for groundwater contamination. It is recommended that this well be installed (in accordance with the original work scope) to the confining bed. The well screen should extend the entire length of the well.

Site 16: 16GW05 and 16GW06 - Intermediate Depth Wells (25'): An upgradient or background well must be located. (Two locations are shown on Figure 1-5.)

Site 19: 19GW03 - Shallow Well (5'): The water table in existing wells 19GW01 and 19GW02 is less than 5 feet from ground surface. It is recommended that a shallow well intersecting the piezometric surface be installed in order to collect representative groundwater samples in that zone. Coordination of drilling activities with Lieutenant Colonel H.G. Hutchinson (Ext. 2233/2671) is critical since access to this proposed location is across a runway.

The redrill of the well at Site 13 must be coordinated with Mr. Jim Tooker (maintenance operator) at Ext. 3153 or 3942. Utility maps must be referenced to avoid potential subsurface problems. All drilling activities will be conducted in accordance with the Health and Safety Plan in Appendix B.

## 2.0 SURVEYING

### Task 2: Conduct Surveying

The location of 77 wells will be surveyed. Wells included in the surveying are summarized by site in Table 2-1.

All surveying activities will be conducted in accordance with the Health and Safety Plan in Appendix B.

**TABLE 2-1**  
**WELLS TO BE SURVEYED**  
**MCAS, CHERRY POINT, NORTH CAROLINA**

	<u>1</u>	<u>2</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>10</u>	<u>10 (Potable)</u>	<u>13</u>	<u>15</u>	<u>16</u>	<u>19</u>	<u>21</u>	
	1GW01	2GW01	4GW01	5GW01	6GW01	7GW01	10EGW01	10PW01	13GW01	15GW01	16GW01	19GW01	21GW01	
	1GW02	2GW02	4GW02	5GW02	6GW02	7GW02	10EGW02	10PW02	13GW02	15GW02	16GW02	19GW02	21GW02	
	1GW03	2GW03*	4GW03	5GW03	6GW03	7GW03*	10EGW03	10PW03	13GW03	15GW03	16GW03	19GW03*	21GW03	
	1GW04*		4GW04	5GW04	6GW04		10GW04	10PW04	13GW04	15GW04	16GW04		21GW04	
			4GW05	5GW05			10EGW05	10PW05	13GW05	15GW05	16GW05*		21GW05	
				5GW06			10EGW06	10PW06	13GW06	15GW06	16GW06*			
				5GW07*			10EGW07	10PW11	13GW07					
							10EGW08	10PW13	13GW08					
							10GW09	10PW16						
							10GW10	10PW17						
							10GW11							
							10GW12							
							10EGW13							
<b>Total</b>	<b>4</b>	<b>3</b>	<b>5</b>	<b>7</b>	<b>4</b>	<b>3</b>	<b>13</b>	<b>10</b>	<b>8</b>	<b>6</b>	<b>6</b>	<b>3</b>	<b>5</b>	<b>77 Total</b>

\* To be installed during Round 2 field activities

### 3.0 SAMPLING

#### Task 3: Conduct Sampling

Samples will be collected from Sites 1, 2, 4, 5, 6, 7, 10, 13, 15, 16, 17, 19, and 21. A site-by-site tabulation of sample numbers and corresponding analysis is presented in Tables 3-1 through 3-12. A key to the chemical analysis abbreviations is presented in Table 3-12. The location of each sample is shown on a site-by-site basis in Figures 3-1 through 3-11. Contact personnel for site-specific sampling are shown in Table 3-13.

In addition to analysis shown, the pH of all samples will be taken, water levels in all wells measured, and the petroleum, oil, and lubricant layer measured in monitoring wells at Sites 5 and 13.

All work activities will be conducted in accordance with the Health and Safety Plan in Appendix B.

TABLE 3-1  
 SAMPLING PLAN  
 SITES 1 AND 2  
 MCAS, CHERRY POINT, NORTH CAROLINA

<u>Sample Location ID Number</u>	<u>PP</u>	<u>Cr<sup>6+</sup></u>	<u>CN</u>	<u>EDB</u>
<b>Site 1: Groundwater</b>				
1GW01	X	X	X	X
1GW02	X	X	X	X
1GW03	X	X	X	X
1GW04*	X	X	X	X
<b>Site 2: Groundwater</b>				
2GW01	X	X	X	X
2GW02	X	X	X	X
2GW03*	X	X	X	X
<b>TOTAL</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>

---

\*To be installed during Round 2.

**TABLE 3-2**  
**SAMPLING PLAN**  
**SITE 4**  
**MCAS, CHERRY POINT, NORTH CAROLINA**

<u>Sample Location ID Number</u>	<u>PP</u>	<u>Cr<sup>6+</sup></u>	<u>CN</u>	<u>EDB</u>	<u>Asbestos</u>
<b>Groundwater</b>					
4GW01	X	X	X	X	-
4GW02	X	X	X	X	-
4GW03	X	X	X	X	-
4GW04	X	X	X	X	-
4GW05	X	X	X	X	-
<b>Surface Water</b>					
4SW01	X	X	X	X	-
<b>TOTAL (Water)</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>-</b>
<b>Soils</b>					
4S001	-	-	-	-	X
4S002	-	-	-	-	X
4S003	-	-	-	-	X
4S004	-	-	-	-	X
4S005	-	-	-	-	X
<b>TOTAL (Soil)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>5</b>

**TABLE 3-3**  
**SAMPLING PLAN**  
**SITE 5**  
**MCAS, CHERRY POINT, NORTH CAROLINA**

Sample Location ID Number	Organics PP	EDB	PCB	Oil & Grease	TCDD	Pb	As	GC Fuel
<b>Groundwater</b>								
5GW01	X	X	X	X	-	X	-	X
5GW02	X	X	X	X	-	X	-	X
5GW03	X	X	X	X	-	X	-	X
5GW04	X	X	X	X	-	X	-	X
5GW05	X	X	X	X	-	X	-	X
5GW06	X	X	X	X	-	X	-	X
5GW07*	X	X	X	X	-	X	-	X
<b>Surface Water</b>								
5SW01	X	X	X	X	-	X	-	X
<b>TOTAL (Water)</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>-</b>	<b>8</b>	<b>-</b>	<b>8</b>
<b>Sediment</b>								
5SD01	X	-	X	-	X	X	-	-
<b>TOTAL (Sediment)</b>	<b>1</b>	<b>-</b>	<b>1</b>	<b>-</b>	<b>1</b>	<b>1</b>	<b>-</b>	<b>-</b>

\*To be installed during Round 2.

NOTE: Measure POL layer in monitoring wells.

TCDD (Screening Only)

GC (gas chromatograph)

TABLE 3-4

**SAMPLING PLAN**  
**SITE 6**  
**MCAS, CHERRY POINT, NORTH CAROLINA**

<u>Sample Location ID Number</u>	<u>VOA PP</u>	<u>Phenolics</u>	<u>Metals</u>	<u>As</u>
<b>Groundwater</b>				
6GW01	X	X	X	X
6GW02	X	X	X	X
6GW03	X	X	X	X
6GW04	X	X	X	X
<b>TOTAL</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>4</b>

TABLE 3-5  
 SAMPLING PLAN  
 SITE 7  
 MCAS, CHERRY POINT, NORTH CAROLINA

<u>Sample Location ID Number</u>	<u>PP</u>	<u>Cr<sup>6+</sup></u>	<u>EDB</u>
<b>Groundwater</b>			
7GW01	X	X	X
7GW02	X	X	X
7GW03*	X	X	X
<b>Surface Water</b>			
7SW01	X	X	X
7SW02	X	X	X
7SW03	X	X	X
<b>TOTAL (Water)</b>	<b>6</b>	<b>6</b>	<b>6</b>
<b>Sediment</b>			
7SD01	X	X	X
7SD02	X	X	X
7SD03	X	X	X
<b>TOTAL (Soil)</b>	<b>3</b>	<b>3</b>	<b>3</b>

---

\*To be installed during Round 2.

Note: 7SW02 and 7SW03 samples to be taken above treatment plant discharge point.

TABLE 3-6  
**SAMPLING PLAN**  
**SITE 10**  
**MCAS, CHERRY POINT, NORTH CAROLINA**

<u>Sample Location ID Number</u>	<u>PP</u>	<u>Cr<sup>6+</sup></u>	<u>EDB</u>	<u>GWCI</u>
<b>Groundwater</b>				
10EGW01	X	X	X	X
10EGW02	X	X	X	X
10EGW03	X	X	X	X
10GW04	X	X	X	X
10EGW05	X	X	X	X
10EGW06	X	X	X	X
10EGW07	X	X	X	X
10EGW08	X	X	X	X
10EGW09	X	X	X	X
10EGW10	X	X	X	X
10EGW11	X	X	X	X
10GW12	X	X	X	X
10EGW13	X	X	X	X
10PW01	X	X	X	X
10PW02	X	X	X	X
10PW03	X	X	X	X
10PW04	X	X	X	X
10PW05	X	X	X	X
10PW06	X	X	X	X
10PW11	X	X	X	X
10PW13	X	X	X	X
10PW16	X	X	X	X
10PW17	X	X	X	X
<b>SUBTOTAL (Water)</b>	<b>23</b>	<b>23</b>	<b>23</b>	<b>23</b>
<b>Surface Water/Leachate</b>				
10LW01	X	X	X	X
10LW02	X	X	X	X
10SW03	X	X	X	X
10LW04	X	X	X	X
10LW05	X	X	X	X
<b>SUBTOTAL (Water)</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>
<b>TOTAL (Water)</b>	<b>28</b>	<b>28</b>	<b>28</b>	<b>28</b>

TABLE 3-6  
 SAMPLING PLAN  
 SITE 10  
 MCAS, CHERRY POINT, NORTH CAROLINA  
 PAGE TWO

<u>Sample Location</u> <u>ID Number</u>	<u>PP</u>	<u>Cr<sup>6+</sup></u>	<u>EDB</u>	<u>GWCl</u>
<b>Sediment/Leachate Soil</b>				
10LS01	X	X		
10LS02	X	X		
10SD03	X	X		
10LS04	X	X		
10LS05	X	X		
<b>TOTAL (Soils)</b>	<b>5</b>	<b>5</b>		

Note: Collection of a leachate sample in the vicinity of location 10LW05 is critical because of its proximity to the upgradient surface impoundments.

**TABLE 3-7**  
**SAMPLING PLAN**  
**SITE 13**  
**MCAS, CHERRY POINT, NORTH CAROLINA**

<u>Sample Location ID Number</u>	<u>VOA PP</u>	<u>EDB</u>	<u>Oil &amp; Grease</u>	<u>Pb</u>	<u>GC Fuel</u>
<b>Groundwater</b>					
13GW01	X	X	X	X	-
13GW02	X	X	X	X	-
13GW03	X	X	X	X	X
13GW04	X	X	X	X	X
13GW05	X	X	X	X	X
13GW06	X	X	X	X	X
13GW07	X	X	X	X	-
13GW08	X	X	X	X	-
<b>TOTAL (Water)</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>4</b>
<b>Misc.</b>					
13F05					X
<b>TOTAL (Fuel Oil)</b>					<b>1</b>

---

**NOTE:** Measure POL layer in monitoring wells.  
GC: gas chromatograph  
Fuel Oil: JP4

TABLE 3-8  
 SAMPLING PLAN  
 SITE 15  
 MCAS, CHERRY POINT, NORTH CAROLINA

<u>Sample Location ID Number</u>	<u>VOA PP</u>	<u>CN</u>	<u>Phenolics</u>	<u>Metals</u>
<b>Groundwater</b>				
15GW01	X	X	X	X
15GW02	X	X	X	X
15GW03	X	X	X	X
15GW04	X	X	X	X
15GW05	X	X	X	X
15GW06	X	X	X	X
<b>Surface Water</b>				
15SW01	X	X	X	X
15SW02	X	X	X	X
15SW03	X	X	X	X
<b>TOTAL (Water)</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>
<b>Sediment</b>				
15SD01			X	
15SD02			X	
15SD03			X	
15SD04			X	
15SD05			X	
15SD06			X	
15SD07			X	
15SD08			X	
<b>TOTAL (Sediment)</b>			<b>8</b>	

**TABLE 3-9**  
**SAMPLING PLAN**  
**SITE 16**  
**MCAS, CHERRY POINT, NORTH CAROLINA**

<u>Sample Location ID Number</u>	<u>PP</u>	<u>Cr<sup>6+</sup></u>	<u>CN</u>	<u>EDB</u>
<b>Groundwater</b>				
16GW01	X	X	X	X
16GW02	X	X	X	X
16GW03	X	X	X	X
16GW04	X	X	X	X
16GW05*	X	X	X	X
16GW06*	X	X	X	X
<b>TOTAL (Water)</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>6</b>

---

\*To be installed during Round 2.

TABLE 3-10  
SAMPLING PLAN  
SITE 17  
MCAS, CHERRY POINT, NORTH CAROLINA

<u>Sample Location ID Number</u>	<u>PCB</u>	<u>TCDD</u>
Soils		
17S04	X	X
17S05	X	X
17S06	X	X
TOTAL	3	3

TABLE 3-11

**SAMPLING PLAN  
SITES 19 and 21  
MCAS, CHERRY POINT, NORTH CAROLINA**

<u>Sample Location ID Number</u>	<u>PP</u>	<u>Cr<sup>6+</sup></u>	<u>EDB</u>	<u>Asbestos</u>
<b>Groundwater</b>				
19GW01	X	X	X	
19GW02	X	X	X	
19GW03*	X	X	X	
21GW01	X	X	X	
21GW02	X	X	X	
21GW03	X	X	X	
21GW04	X	X	X	
21GW05	X	X	X	
<b>TOTAL (Water)</b>	<b>8</b>	<b>8</b>	<b>8</b>	
<b>Soil</b>				
21S001				X
21S002				X
21S003				X
21S004				X
21S005				X
<b>TOTAL (Soils)</b>				<b>5</b>

---

\*To be installed during Round 2.

TABLE 3-12

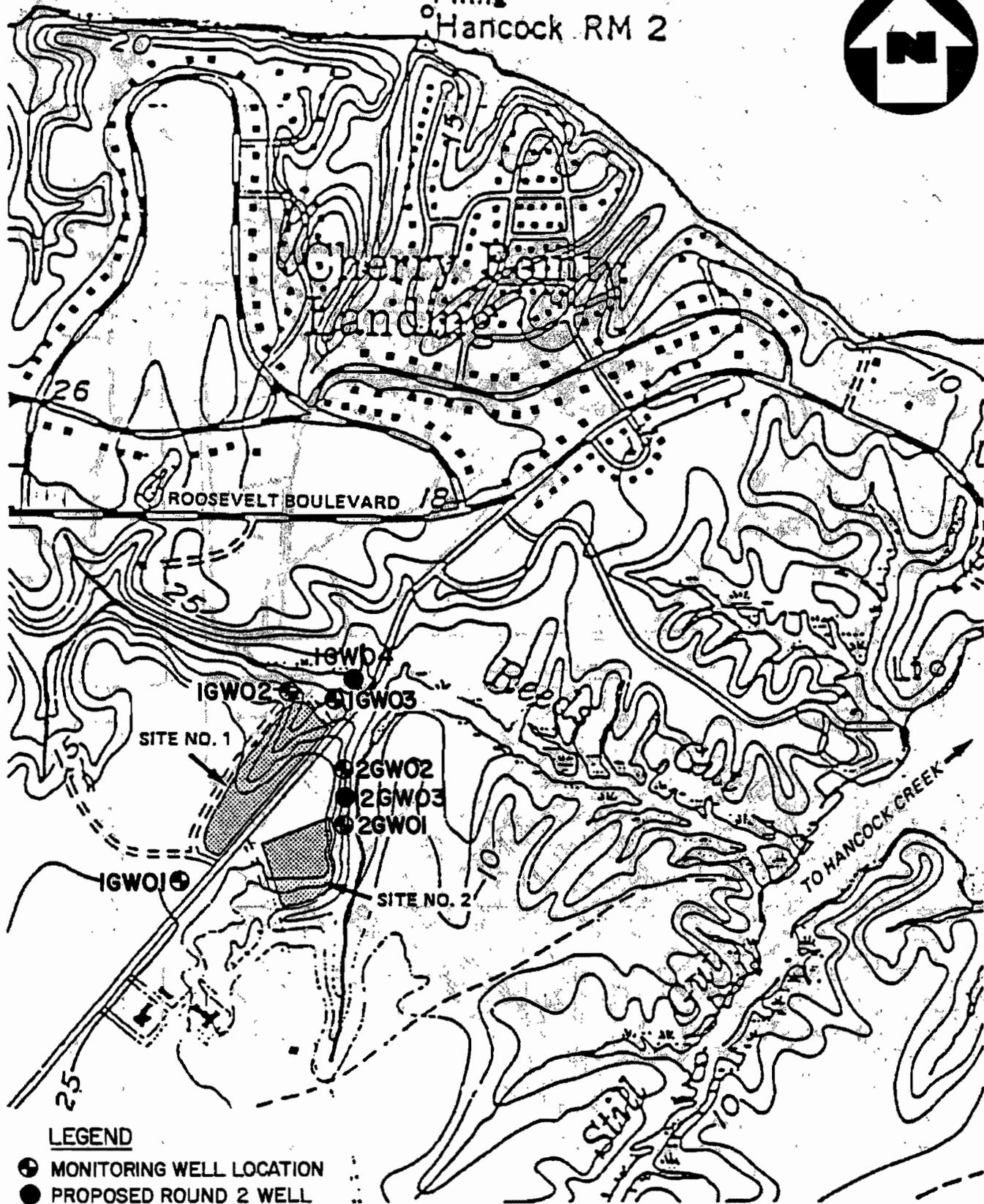
CHEMICAL ANALYSIS  
ABBREVIATION KEY  
MCAS, CHERRY POINT, NORTH CAROLINA

PP:	Priority Pollutant (including MIBK, MEK, and Xylenes)
Cr <sup>6+</sup> :	Hexavalent Chromium
EDB:	Ethylene Dibromide
VOA:	Volatile Organic Analysis
TCDD:	Screening for Dioxin
Metals:	Cu, Cr, Pb, Zn, Cd, Ni, Ag
GWCI:	Groundwater Contaminant Indicators - Specific Conductance, pH, total organic halogens, total organic carbon
GC:	Gas Chromatograph

TABLE 3-13  
CONTACT PERSONNEL  
SAMPLING

<u>Site</u>	<u>Contact</u>	<u>Item</u>
10	Mr. Hall (water plant manager) Mr. Osborne (laboratory manager)	Obtain keys to pump house of potable wells
15	Colonel Watt	Access/clearance as necessary
17	Mr. Beasley, Manager of DPDO	Access for sampling inside DPDO gate only

Piling  
Hancock RM 2



**LEGEND**

- ⊕ MONITORING WELL LOCATION
- PROPOSED ROUND 2 WELL

**MONITORING WELL LOCATIONS**

**SITE NOS. 1 & 2**

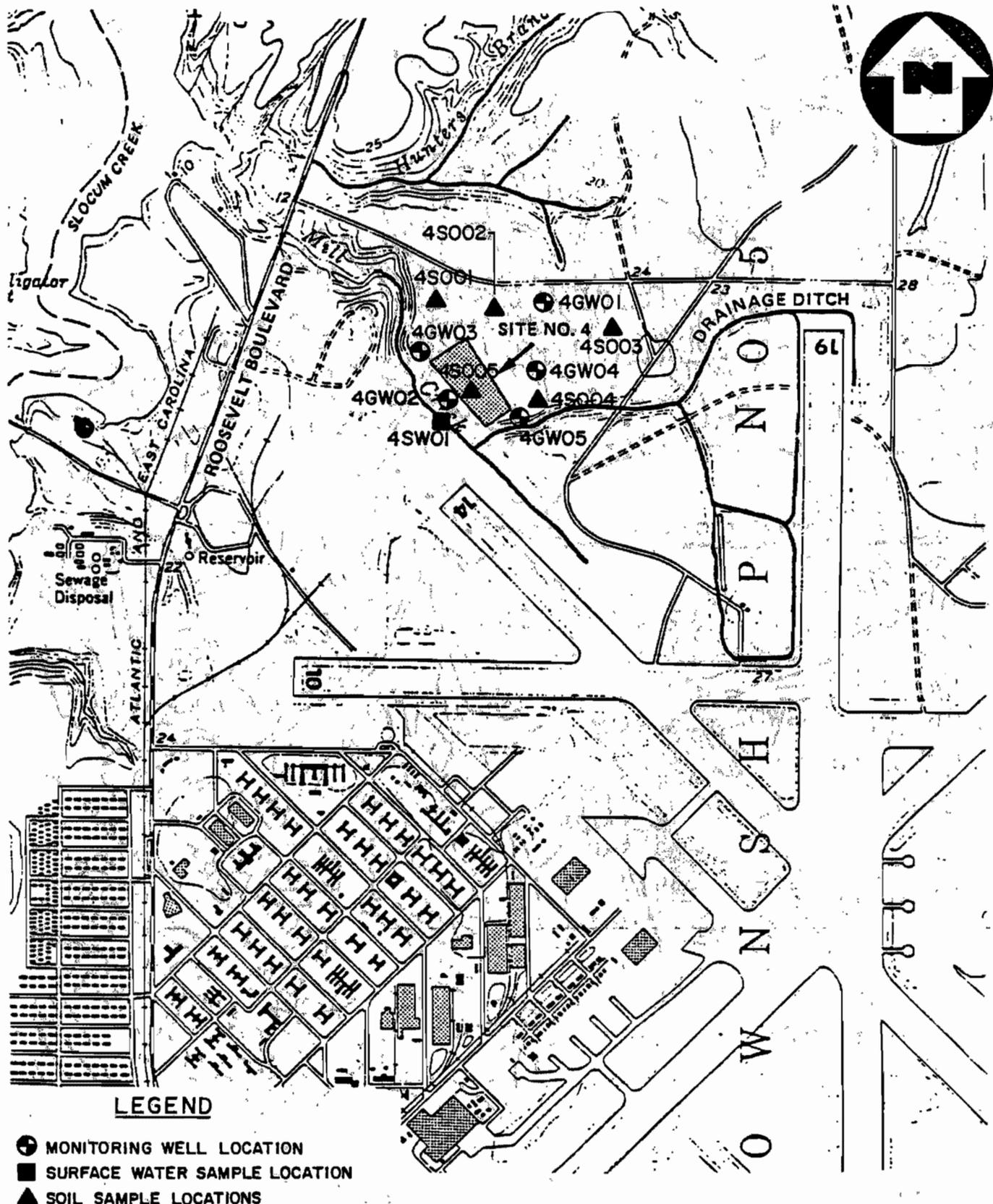
**MCAS CHERRY POINT, NC**

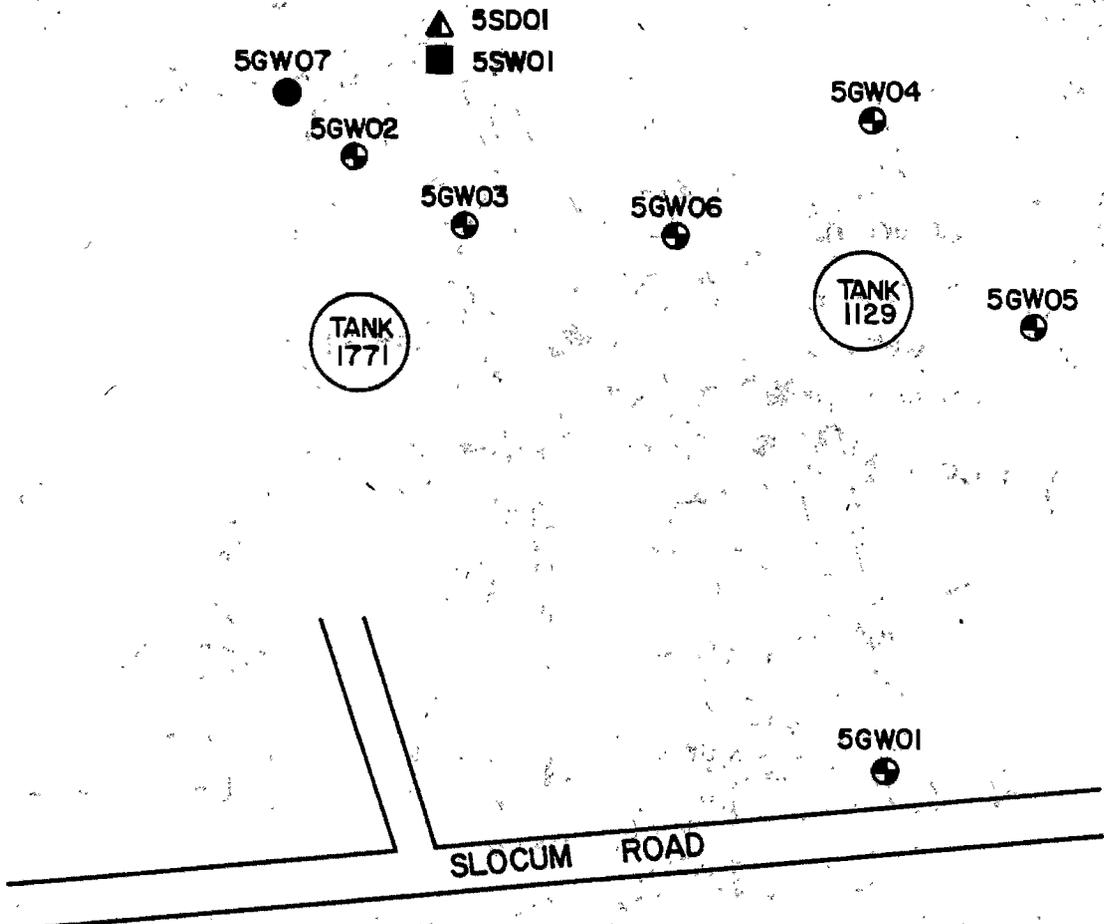
SCALE 1" = 790' ±

**FIGURE 3-1**



**A Halliburton Company**





**LEGEND**

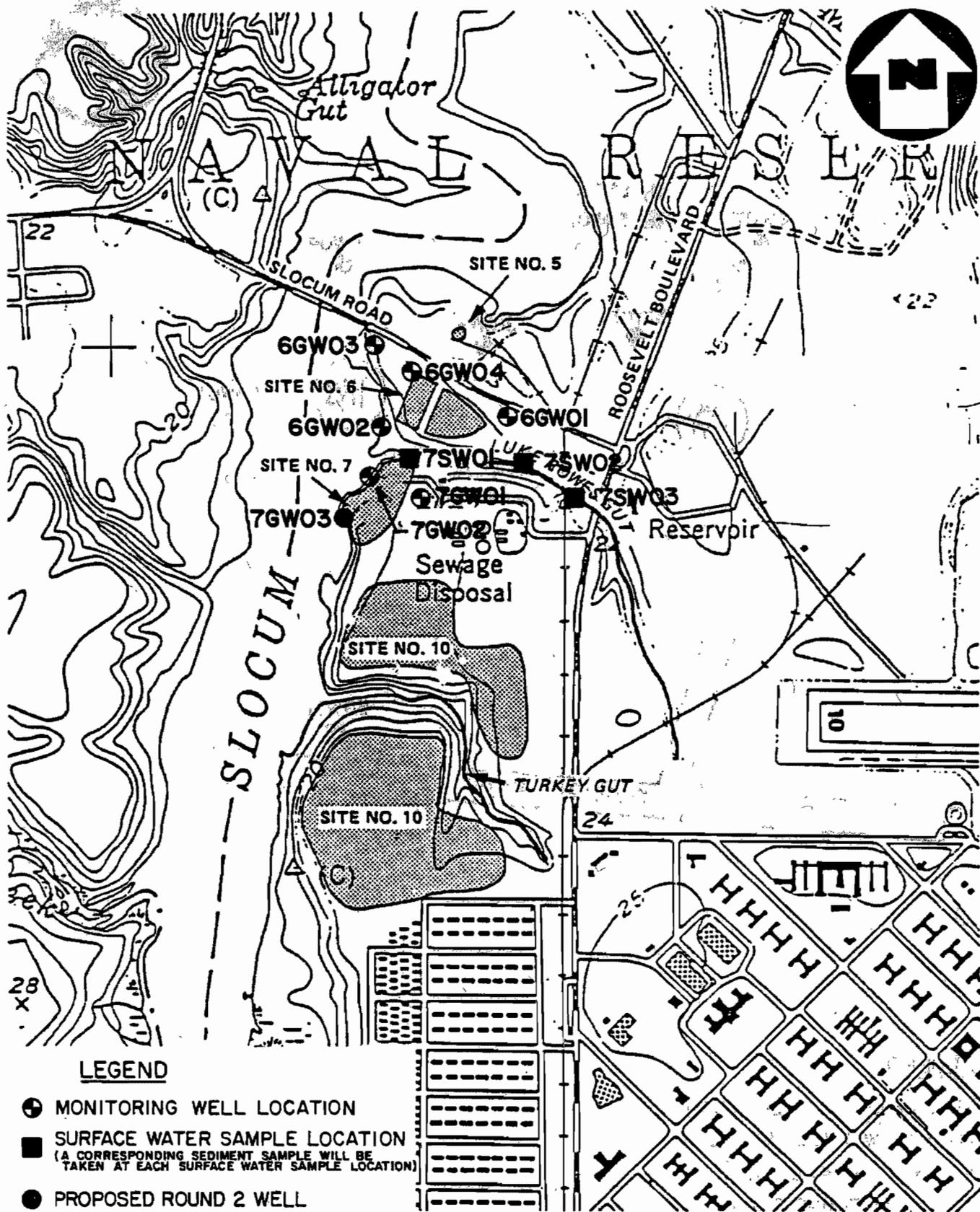
- ⊕ MONITORING WELL LOCATION
- SURFACE WATER SAMPLE LOCATION
- ▲ SEDIMENT SAMPLE LOCATION
- PROPOSED ROUND 2 WELL

**MONITORING WELL, SURFACE WATER  
AND SEDIMENT SAMPLE LOCATIONS, SITE NO. 5  
MCAS CHERRY POINT, NC**

SCALE 1" = ~150' 3-18

**FIGURE 3-3**





**MONITORING WELL, SEDIMENT, AND SURFACE WATER  
SAMPLE LOCATIONS, SITE NOS. 6 & 7  
MCAS CHERRY POINT, NC**

FIGURE 3-4

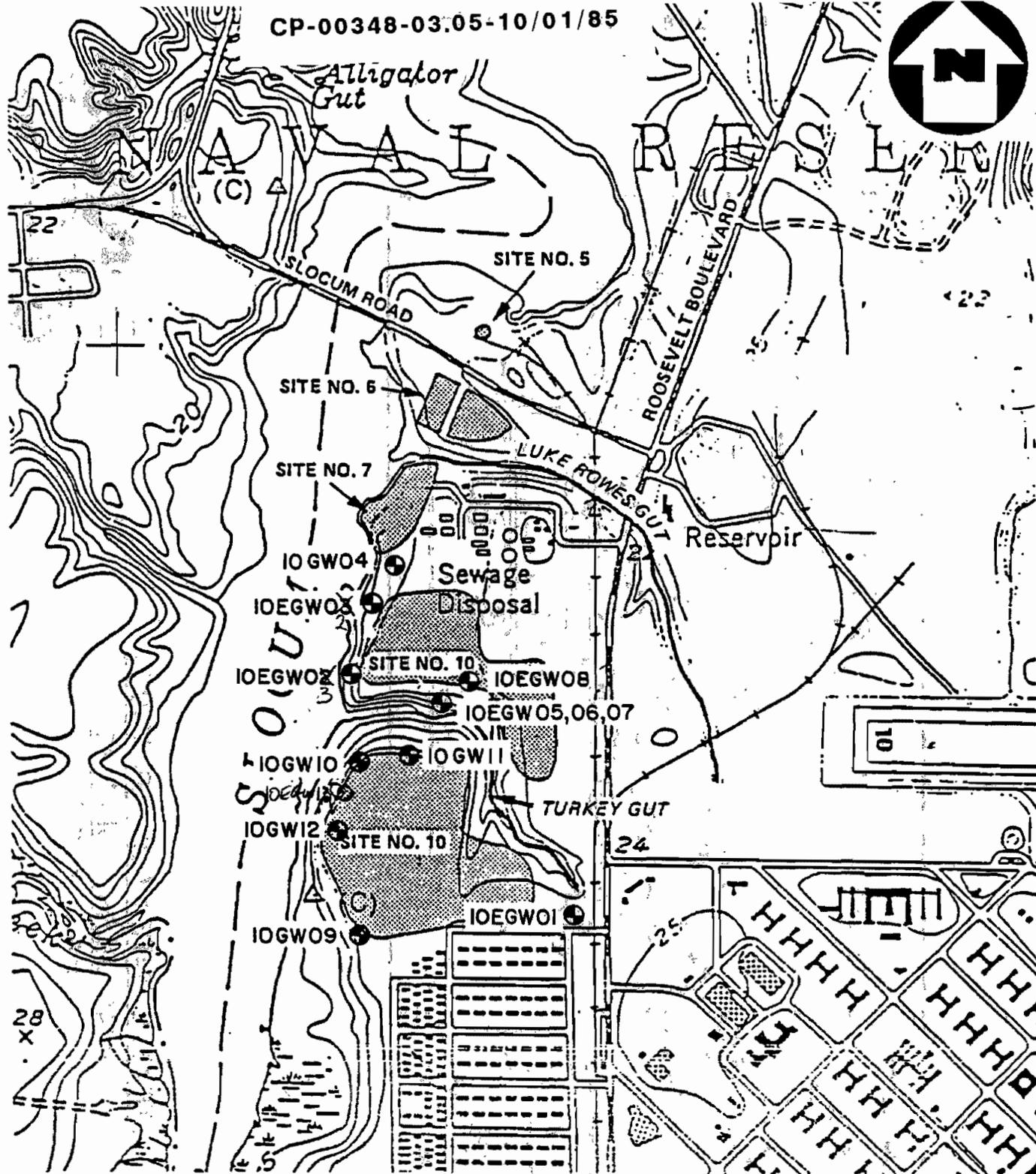
SCALE 1" = 1000'



**NUS**  
CORPORATION



A Halliburton Company



**LEGEND**

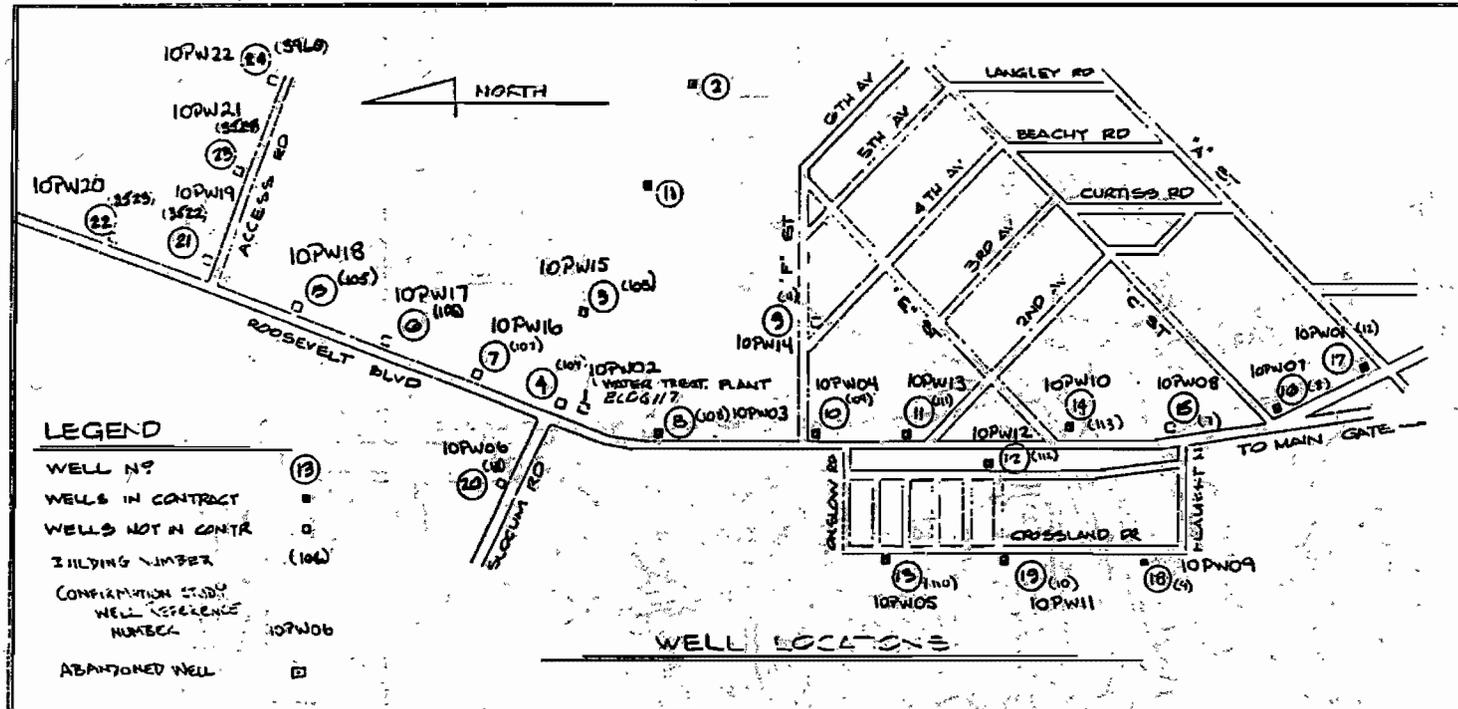
⊕ MONITORING WELL

**MONITORING WELL  
 LOCATIONS, SITE NO. 10  
 MCAS CHERRY POINT, NC  
 SCALE 1" = 1000'**

**FIGURE 3-5**



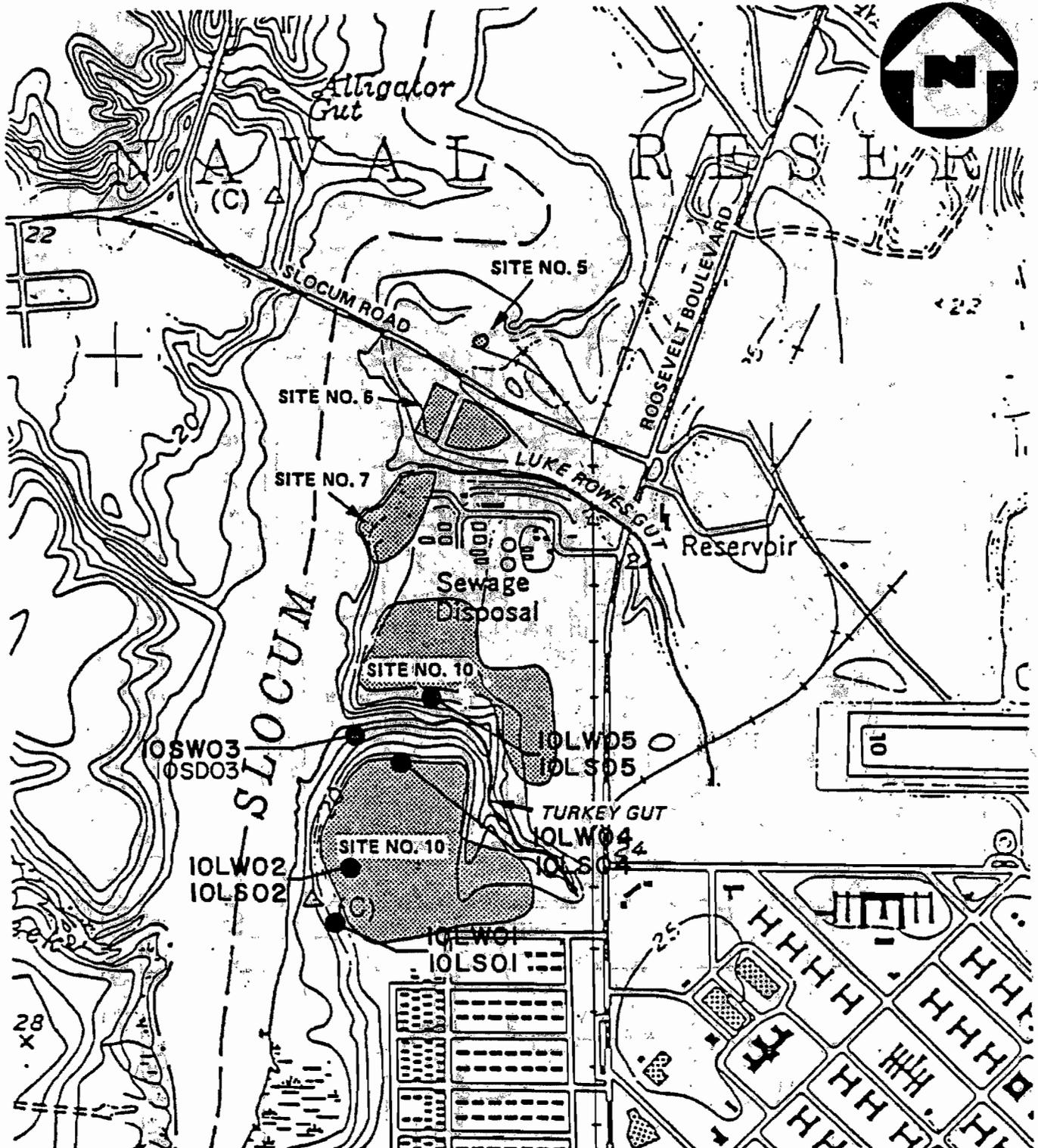
3-21



**POTABLE WATER WELL LOCATIONS**  
**MCAS CHERRY POINT, NC**  
 SCALE: 1" = 2000'

FIGURE 3-6





NOTE: SW = SURFACE WATER SAMPLE, LS = SOIL LEACHATE SAMPLE, LW = SURFACE WATER LEACHATE SAMPLE, BOTH SAMPLES TO BE TAKEN AT THE SAME LOCATION WHERE INDICATED.

**SAMPLE LOCATIONS, SITE NO. 10  
MCAS CHERRY POINT, NC**

SCALE 1" = 1000'

3-22

FIGURE 3-7



**LEGEND**

⊕ MONITORING WELL LOCATION

(PCC APRON PAV'T.)

13GW03

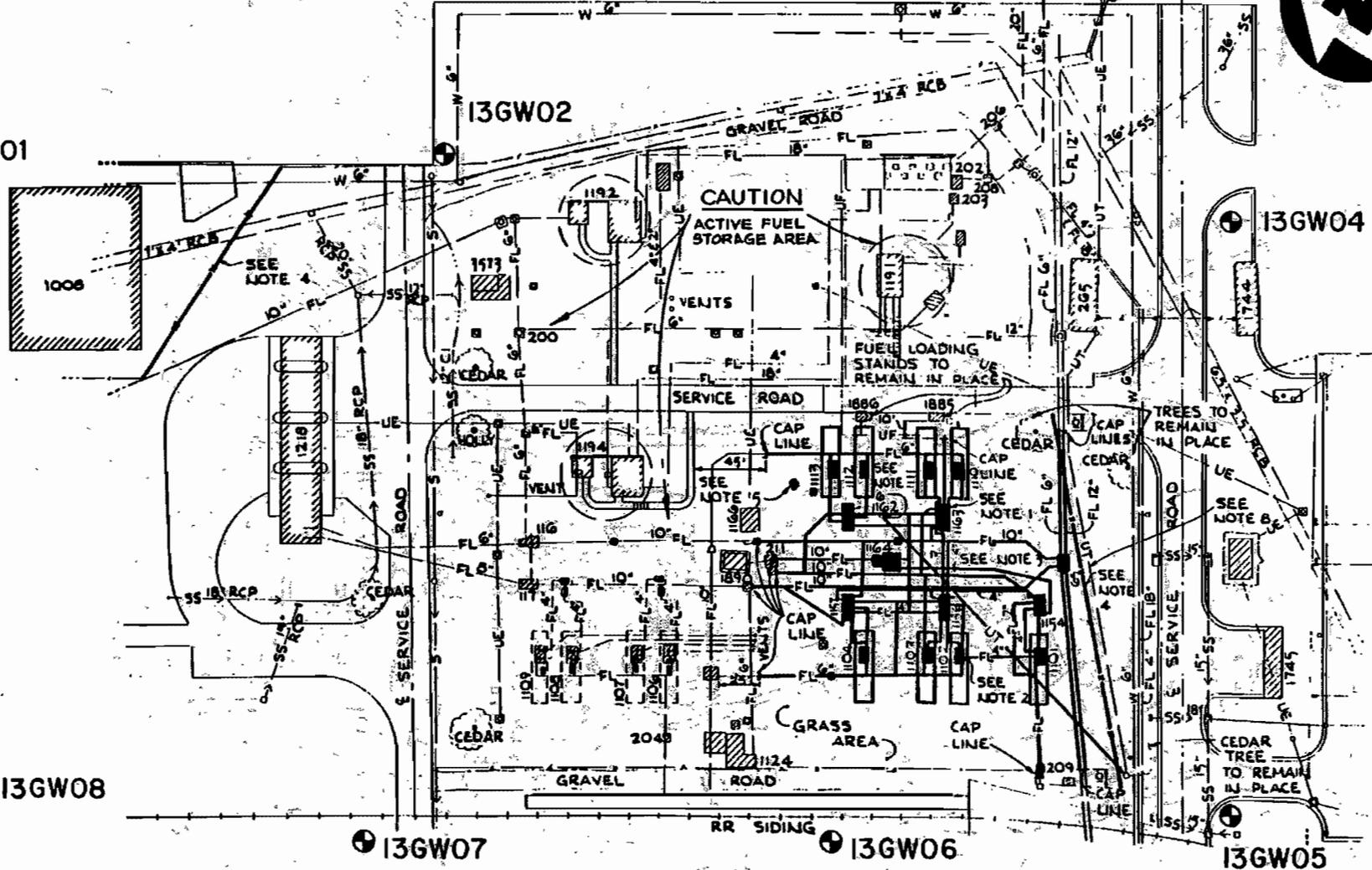


13GW01

13GW02

13GW04

3-23



**MONITORING WELL LOCATIONS, SITE NO. 13**

**MCAS CHERRY POINT, NC**

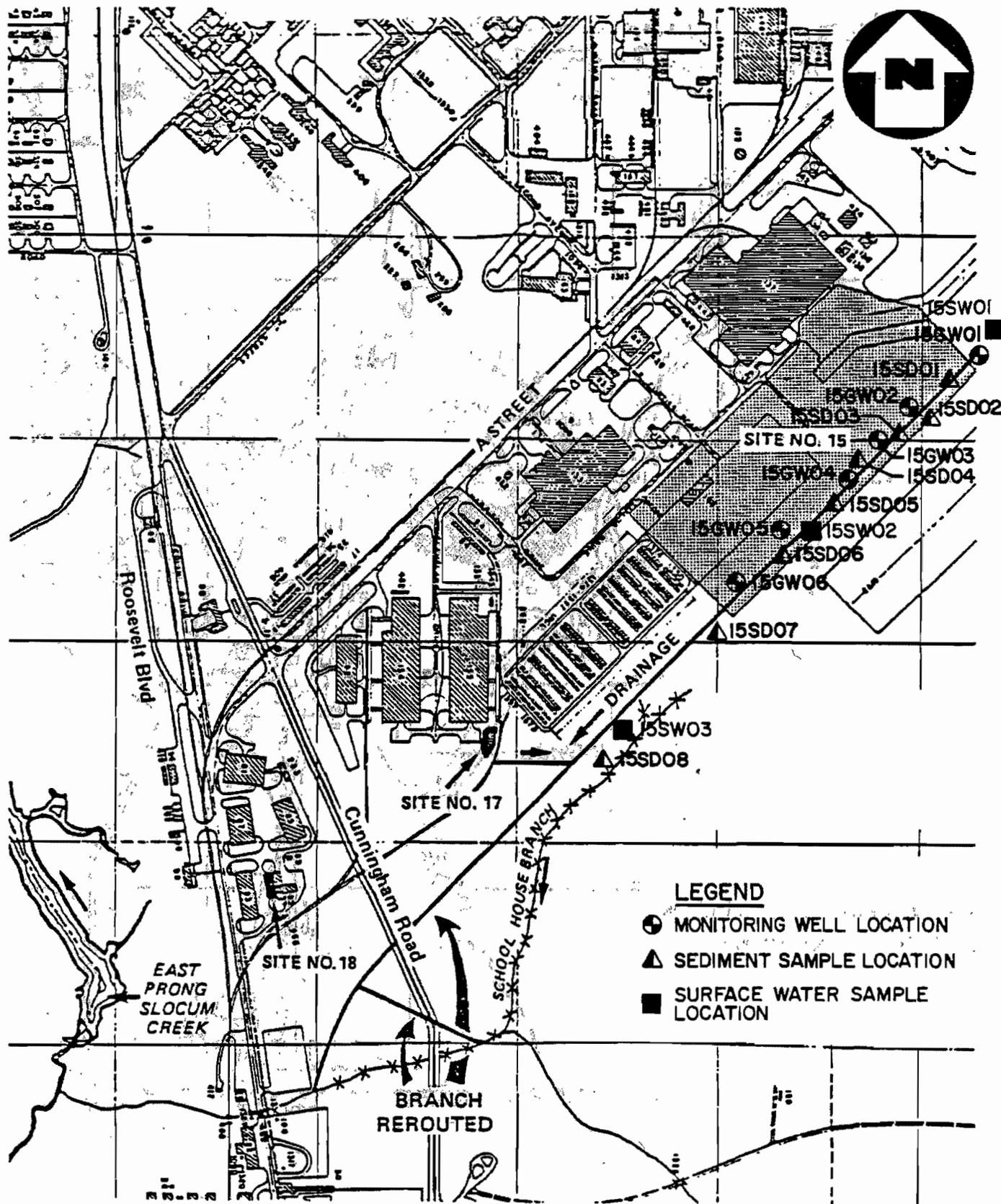
SCALE 1" = 100'

FIGURE 3-8



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**LEGEND**

- MONITORING WELL LOCATION
- ▲ SEDIMENT SAMPLE LOCATION
- SURFACE WATER SAMPLE LOCATION

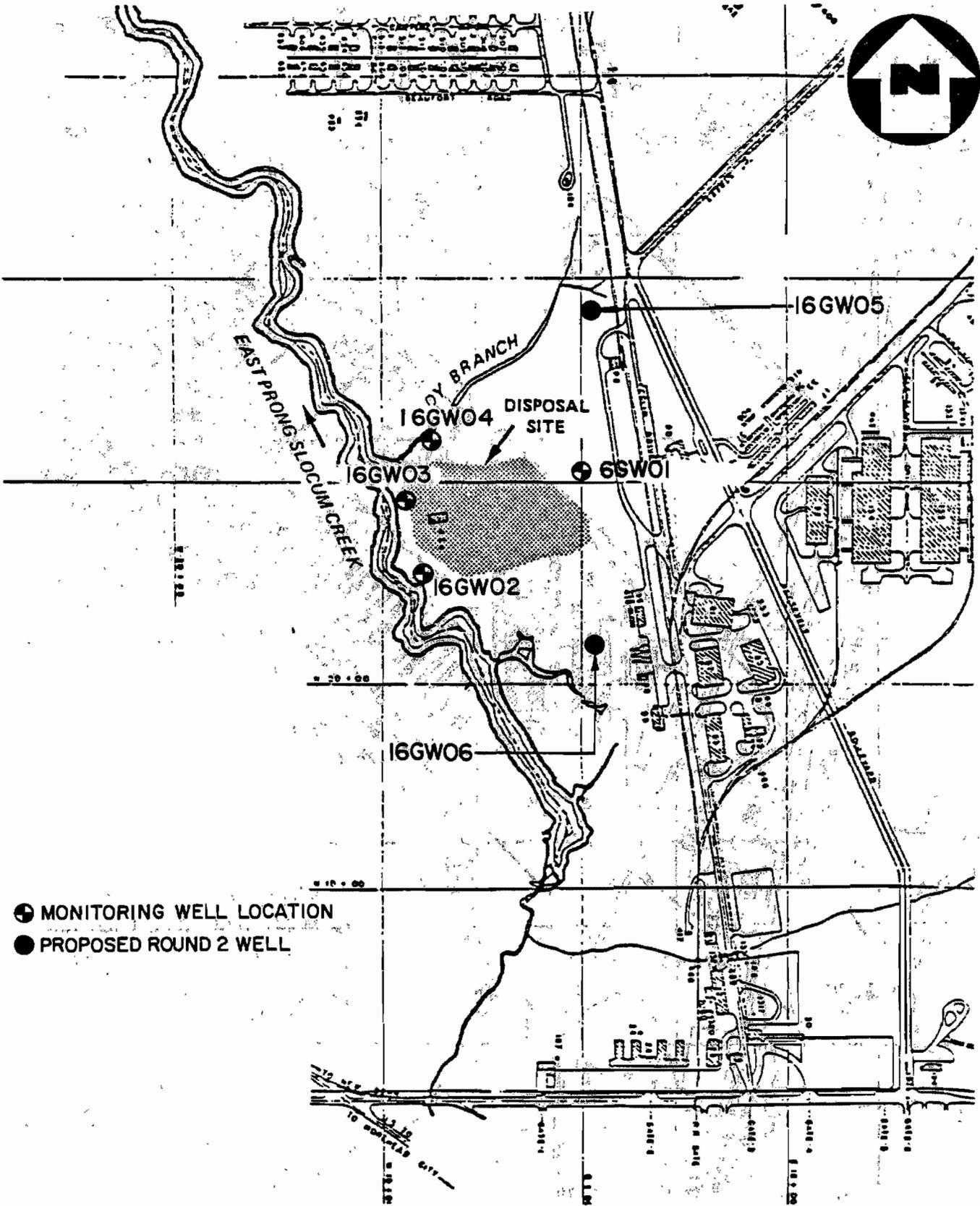
**MONITORING WELL, SURFACE WATER AND SEDIMENT  
SAMPLE LOCATIONS, SITE NO. 15  
MCAS CHERRY POINT, NC**

**FIGURE 3-9**

SCALE 1" = 675'



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- ⊕ MONITORING WELL LOCATION
- PROPOSED ROUND 2 WELL

**MONITORING WELL LOCATIONS**

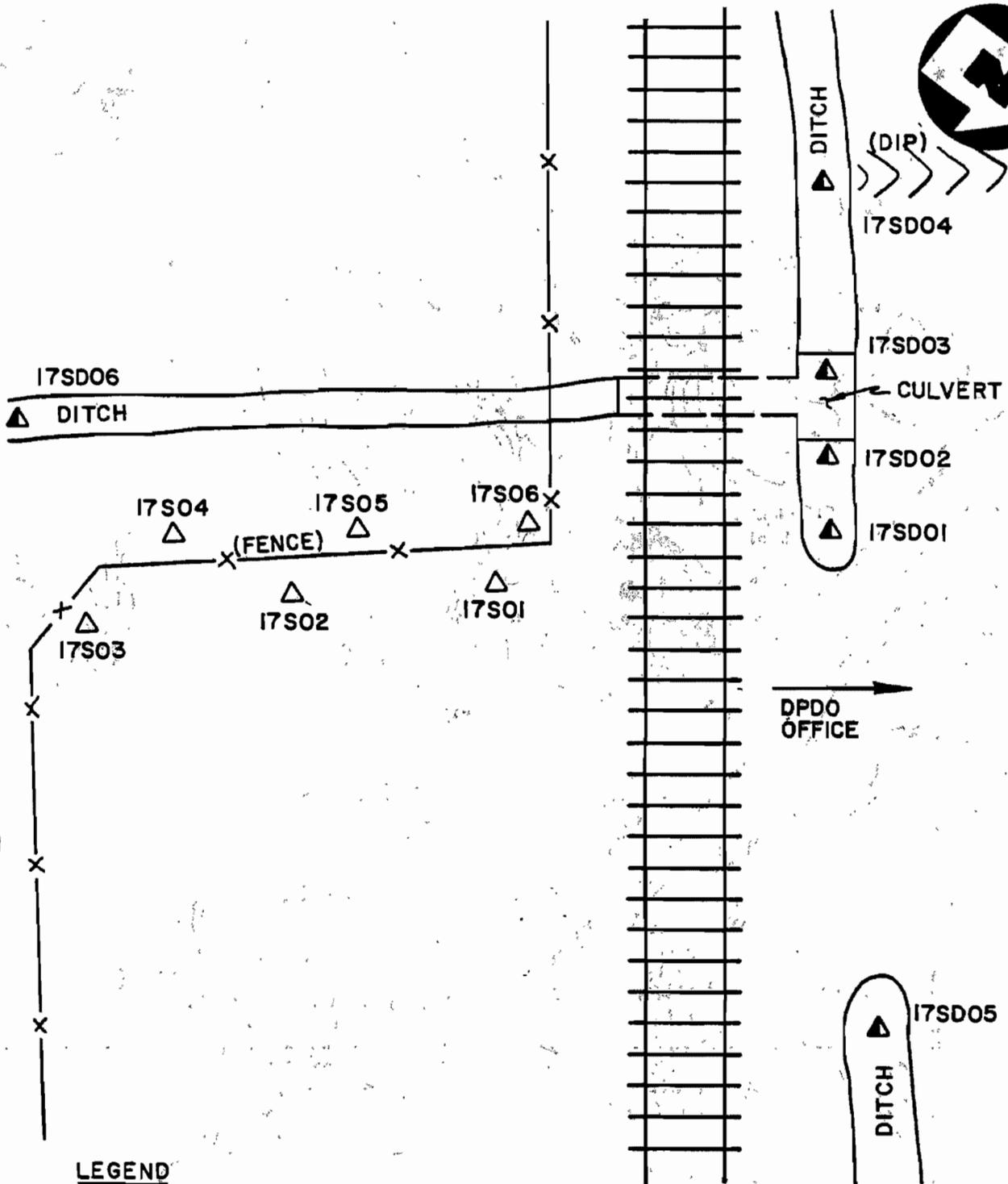
**SITE NO. 16**  
**MCAS CHERRY POINT, NC**

SCALE 1" = 700' ±

FIGURE 3-10



**A Halliburton Company**



**LEGEND**

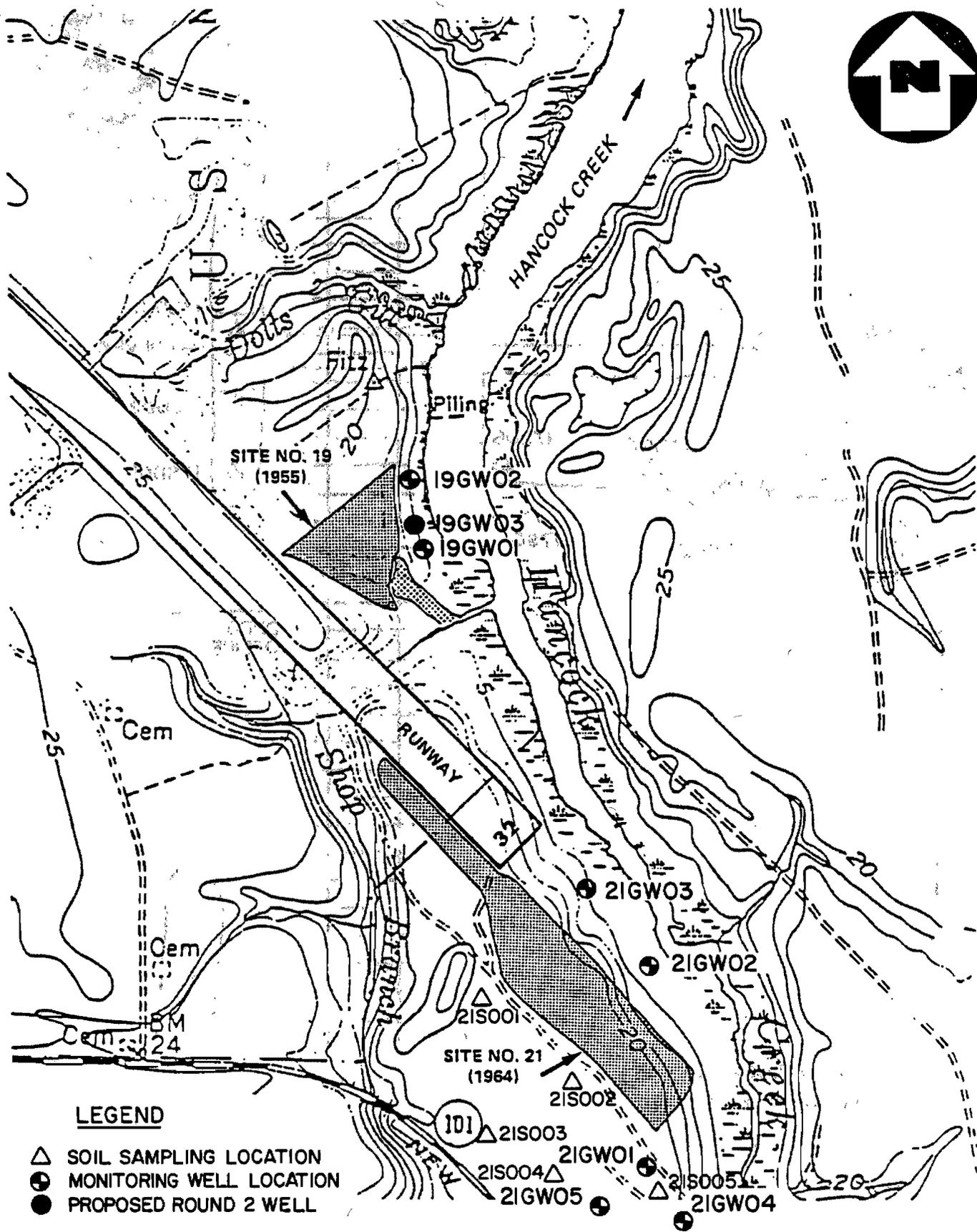
- △ SOIL SAMPLE LOCATION
- ▲ SEDIMENT SAMPLE LOCATION

**SOIL/SEDIMENT SAMPLE  
LOCATIONS, SITE NO. 17  
MCAS CHERRY POINT, NC**

SCALE 1" = ≈ 100'

**FIGURE 3-11**





**4.0 LABORATORY ANALYSIS**

**Task 4: Perform Laboratory Analysis**

Samples collected during Task 3 will be analyzed as summarized in Table 4-1.

**TABLE 4-1**  
**SUMMARY**  
**SAMPLE ANALYSIS**  
**MCAS, CHERRY POINT, NORTH CAROLINA**

**Water Samples/Round 2 Sampling**

Site	PP	Organics PP	VOA PP	Cr <sup>6+</sup>	CN	EDB	Asbestos	PCB	Oil & Grease	Phenolics	EP Toxicity	TCDD	GWCI	Metals	Pb	As	GC Fuel
1&2	7	--	--	7	7	7	--	--	--	--	--	--	--	--	--	--	--
4	6	--	--	6	6	6	--	--	--	--	--	--	--	--	--	--	--
5	--	8	--	--	--	8	--	8	8	--	--	--	--	--	8	--	8
6	--	--	4	--	--	--	--	--	--	4	--	--	--	--	--	4	--
7	6	--	--	6	--	6	--	--	--	--	--	--	--	--	--	--	--
10	28	--	--	28	--	28	--	--	--	--	--	--	28	--	--	--	--
13	--	--	8	--	--	8	--	--	8	--	--	--	--	--	8	--	4
15	--	--	9	--	9	--	--	--	--	9	--	--	--	--	9	--	--
16	6	--	--	6	6	6	--	--	--	--	--	--	--	--	--	--	--
19&21	8	--	--	8	--	8	--	--	--	--	--	--	--	--	--	--	--
Fuel Oil Standard	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1
<b>Total</b>	<b>61</b>	<b>8</b>	<b>21</b>	<b>61</b>	<b>28</b>	<b>77</b>	<b>--</b>	<b>8</b>	<b>16</b>	<b>13</b>	<b>--</b>	<b>--</b>	<b>28</b>	<b>13</b>	<b>16</b>	<b>4</b>	<b>13</b>

**Soil and Sediment Samples/Round 2 Sampling**

4	--	--	--	--	--	--	5	--	--	--	--	--	--	--	--	--	--
5	--	1	--	--	--	--	--	1	--	--	--	1	--	--	1	--	--
7	3	--	--	3	--	3	--	--	--	--	--	--	--	--	--	--	--
10	5	--	--	5	--	--	--	--	--	--	--	--	--	--	--	--	--
15	--	--	--	--	--	--	--	--	--	--	8	--	--	--	--	--	--
17	--	--	--	--	--	--	--	3	--	--	--	3	--	--	--	--	--
21	--	--	--	--	--	--	5	--	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>8</b>	<b>1</b>	<b>--</b>	<b>8</b>	<b>--</b>	<b>3</b>	<b>10</b>	<b>4</b>	<b>--</b>	<b>--</b>	<b>8</b>	<b>4</b>	<b>--</b>	<b>--</b>	<b>1</b>	<b>--</b>	<b>--</b>

**Note:** PP (Priority Pollutants) includes MIBK, MEK, Xylenes  
 GWCI: Specific Conductance, pH, total organic halogens, total organic carbon  
 Metals: Cu, Cr, Pb, Zn, Cd, Ni, Ag  
 TCDD: Dioxin Screening, GC: Gas Chromatograph  
 Key to abbreviations appears in Table 3-12

4-2

CP-00348-03.05-10/01/85

**5.0 SLOCUM CREEK DATA**

**Task 5: Perform Slocum Creek Study Evaluation**

The data collected for Slocum Creek (see Table 5-1) will be reduced, compiled, and evaluated. The results of these efforts will be presented in the Round 2 report.

TABLE 5-1

**SLOCUM CREEK STUDY  
DATA SUMMARY  
MCAS, CHERRY POINT, NORTH CAROLINA**

<u>Sample Type and Description</u>	<u>Number</u>	<u>Analysis</u>
<b>Aquatic Biota</b>		
Fish Fillet	27	Pesticides & PCB
Whole Fish	28	Metals <sup>(1)</sup> & Organics
Crab	2	Pesticides & PCB
	3	Metals <sup>(1)</sup> & Organics
Clam	4	Pesticides & PCB
	4	Metals <sup>(1)</sup> & Organics
<b>Sediment</b>	20	Organics, Metals <sup>(2)</sup> , Pesticides & PCB
<b>Water</b>	30	Metals <sup>(3)</sup> , Cyanide, Fluoride, Oil & Grease, & Surfactants
<b>Total Number of Samples</b>	<b>118</b>	

---

(1)Includes: As, Ag, Be, Cd, Cr, Cu, Ni, Pb, Sb, Se, Tl, Zn

(2)Includes: Ag, Al, Be, Cd, Cr, Cu, Hg, Ni, Pb, Se, Sb, Tl, Zn

(3)Includes: Be, Cd, Cr, Cu, Fe, Ni, Pb, Zn

**6.0 REPORTS**

**Task 6: Prepare Reports**

Reports to be submitted to the Department of the Navy will include (1) the plan of action and milestones; (2) the Round 2 Report summarizing Round 2 field activities, presenting evaluation results, and recommending Round 3 activities; and (3) monthly status reports.

**7.0 EXPOSURE ASSESSMENT**

**Task 7: Conduct Exposure Assessment of Surface Impoundments**

The exposure assessment of the surface impoundments will be completed according to the scope of work shown in Appendix A.

**8.0 MILESTONES**

The schedule for Round 2 activities and the Exposure Assessment of the Surface Impoundments is presented in Table 8-1:

TABLE 8-1

**ROUND 2 SAMPLING & EXPOSURE ASSESSMENT  
MILESTONE/PERCENT COMPLETE  
MCAS, CHERRY POINT, NORTH CAROLINA**

<u>Month</u>	<u>Milestone</u>	<u>% Complete Cumulative</u>
October 1985	Submit Draft Report of Exposure Assessment to Navy	
	Submit Plan of Action and Milestones	
	Conduct Task 1 Drilling	
	Conduct Task 2 Surveying	
	Conduct Task 3 Sampling	
	Initiate Task 4 Laboratory Analysis	
	Initiate Task 5 Slocum Creek Study	15
November 1985	Revise and Submit Exposure Assessment to USEPA	
	Complete Task 1, 2, and 3 Activities	
	Complete Task 4 Laboratory Analysis	
	Complete Task 5 Slocum Creek Study	35
December 1985	Prepare Task 6 Round 2 Report and Round 3 Recommendations	
	Revise Exposure Assessment based on USEPA Comments	70
January 1986	Submit Task 6 Draft Round 2 Report and Round 3 Recommendations	90
February 1986	Submit Task 6 Final Round 2 Report and Round 3 Recommendations	100

**APPENDIX A**

**DEPARTMENT OF NAVY WORK SCOPE  
ROUND 2 ACTIVITIES AND  
EXPOSURE ASSESSMENT OF SURFACE IMPOUNDMENTS**

1. Install the seven additional monitoring wells described below to aid in the verification effort:

<u>SITE NUMBER</u>	<u>WELL NUMBER</u>	<u>DEPTH</u>
1	1GW04	65'
2	2GW03	10'
5	5GW07	10'
7	7GW03	35'
16	16GW05	25'
	16GW06	25'
19	19GW03	5'

2. Perform the sampling and analysis detailed in the attached Table 1-9, Summary of Step 1A Verification Sampling Recommendations.

3. Conduct a detailed site survey, both horizontal and vertical, to locate existing monitoring wells, newly installed monitoring wells, and the ten MCAS Cherry Pt potable wells sampled in this round. This data is needed to determine groundwater flow directions at each site and the migration potential of detected contaminants.

4. Within 45 days of completion of the on-site investigations, evaluate all data generated with each sampling event and discuss quantitatively whether contamination has the potential to or is presently affecting the environment or human health. Present the findings as part of the monthly progress reports described in the Scope of Work. Furnish the EIC with two copies and the Activity with three copies of the progress report with the study results. The report should include: a description of all sampling and chemical analytical methods used; a presentation and evaluation of the analytical data; an assessment of actual/potential contamination and migration; ground level elevations and water levels (0.01 foot accuracy) in all wells; boring logs; a detailed surveyed site plan showing the location of suspected contaminant sources, wells, etc.; known toxicity information on contaminants found; current standards/criteria for acceptable levels of contaminants found, including those issued/published by EPA, CDC, NIOSH, OSHA, State and local regulatory/health agencies and/or any other established regulatory/advisory agencies as approved by the EIC; and recommendations for immediate site clean up or third round monitoring.

5. As part of the verification effort, perform data reduction, compilation and evaluation of the results from the Slocum Creek study conducted by the Government. Data evaluation should be consistent with that performed for the current confirmation study investigations and should be incorporated in the verification step draft report.

Enclosure (1)

SUMMARY OF 1A STEP VERIFICATION STUDY SAMPLING RECOMMENDATIONS  
FOR ROUND 2 SAMPLING  
MARINE CORPS AIR STATION, CHERRY POINT, NORTH CAROLINA

CP-00348-03.05-10/01/85

Site No.	How(a) Exist.	Total Number of Samples		Well Water	Surface Water	Sed.	Soft	HSL(b)		VOA	pH	Cr(6)	CN	EDB	Asbestos	PCB	OBG(c)	Phenolics	TOX	EP(d)	TCDD	GHC(e)	Metals(f)	Fuel	GC(g)	
		Wells	Wells																							
1 & 2	5	7						X			X	X	X	X												
4	5	5	5					X			X	X	X	X	X											
5	6	7	1					X	X		X			X	X							X		Pb Pb		
6	4	4						X			X								X					X, AS		
7	1	3	3					X			X	X		X												
10	23(h)	23	5					X	X		X	X		X								X				
13	8	8						X			X			X										Pb		
	4	4						X			X			X												
15	6	6	3					X			X		X	X						X				X		
16	2	4	6					X			X	X	X	X												
17							3															X				
19&21	1	7	8					X			X	X		X												
21							5																X			

(a) New Well recommended for Round 2 sampling.  
 (b) Hazardous Substances List.  
 (c) Oil and Grease concentration levels and measurement of petroleum, oil, and lubricant layer.  
 (d) Cd, Cr, Pb  
 (e) Groundwater Contaminant Indicators: specific conductance, pH, total organic halogens, total organic carbon.  
 (f) Metals: (Cu, Cr, Pb, Zn, Cd, Ni, Ag), unless otherwise noted.  
 (g) Fuel characterization by gas chromatograph. Standards to include heating oil.  
 (h) Includes 13 existing monitoring wells and 10 potable wells.

Scope of Work for Exposure Assessment  
of Surface Impoundments, MCAS Cherry Point

Objective: As required by section 3019 of RCRA, compile information on the potential for public exposure to hazardous wastes through releases from two former surface impoundments located at the old sanitary landfill at MCAS Cherry Pt. N.C.

Background: Industrial waste treatment plant sludges and other liquid wastes were disposed of in two unlined pits in the sanitary landfill north of Turkey Gut. These pits were used from the late 1970's until January 24, 1983. Cleaning and backfilling were conducted in December 1983 and final closure completed in August 1984. Quarterly groundwater monitoring has been conducted by MCAS Cherry Point since September 1984. The potential for environmental contamination from these pits is also being evaluated under the NACIP program. One round of groundwater sampling has been completed at the sanitary landfill waste pits site (Site 10).

Performance Requirements: EPA's Office of Solid Waste has published a Permit Applicant's Guidance Manual for Exposure Information Requirements Under RCRA Section 3019 (Draft Final, June 1985). It is anticipated that existing information will satisfy the EPA requirements; however, you will be required to research and compile this information.

The checklist in Appendix A of the guidance manual summarizes the information requirements. Recommended sources for completing this checklist include the following:

1. Part B Application, MCAS Cherry Point. The exposure assessment will be an addendum to the Part B application, which has been completed by MCAS.
2. Slocum Creek Study Data, MCAS Cherry Point.
3. Closure Plan and Post-closure Plan for the Surface Impoundments, MCAS Cherry Point.
4. Round One Verification Step Raw Data, NACIP program, and,
5. Files of MCAS Cherry Point and those of other local government agencies.

Since closure of the surface impoundments has been completed, many of the checklist/information requirements are not applicable. From discussions with EPA Region IV, these include transportation-related releases and air pathway exposures (must state why not applicable). The discussion of management practices should cover only the exposure to workers from sampling of monitoring wells.

It should be emphasized in the report that human exposure to hazardous wastes cannot be solely attributed to releases from the former surface impoundments. The sanitary landfill, the fly ash ponds, and the old incinerator area are also potential sources of contaminants.

Reporting Requirements: Within 60 days of the notice to proceed, two copies of the typed draft report should be submitted to LANTDIV Code 1143 and three copies to NREA MCAS for Cherry Point review. After the receipt of government

comments, ten copies of the final report (unbound) should be submitted to the Natural Resources and Environmental Affairs Division (NREA) and two copies (bound) to LANTDIV Code 1143. An additional copy of the final report shall be submitted to NREA on 8" diskette, compatible with a Wang OIS-60.

Travel Requirements

Please include the following travel plans for this effort:

<u>Reason</u>	<u>Location</u>	<u>*Time</u>
On Board Review meeting	MCAS Cherry Point N.C.	1 day
Meet with EPA	Region IV Atlanta, GA	1 day
Meet with State of N.C.	Raleigh, N.C.	1 day
* Includes travel time		

Project Milestones:

<u>Milestone</u>	<u>Day</u>
Notice to proceed	0
Submission of draft report	60
Return of government comments	75
Submission of final report	90

**APPENDIX B**

**NUS CORPORATION HEALTH AND SAFETY PLAN  
CHERRY POINT, NORTH CAROLINA  
MARINE CORPS AIR STATION**

## APPENDIX B

**NUS CORPORATION HEALTH AND SAFETY PLAN  
CHERRY POINT, NORTH CAROLINA  
MARINE CORPS AIR STATION**

**1.0 INTRODUCTION**

NUS Corporation has developed a site-specific Health and Safety Plan for the drilling, sampling, and surveying to be done at the Cherry Point, North Carolina, Marine Corps Air Station. This Health and Safety Plan outlines company policies and procedures to be used during the above tasks on the Cherry Point project. Rules and requirements referenced in this plan are the policies of NUS Corporation, along with Federal rules and regulations. These policies are adopted from the NUS Health and Safety Manual for activities at hazardous substance facilities.

The specific health and safety concerns in this plan deal with chemical and physical hazard exposure during the various phases of drilling, sampling, and surveying. The intent is to carry out these duties to the degree that injuries, occupational illnesses, and unwarranted property losses are prevented, while at the same time ensuring compliance with applicable laws and regulations. Emphasis will be placed on individual awareness, personal protective equipment, and emergency response.

In this project, it is expected that the work identified will be installing groundwater monitoring wells and collecting samples of water, leachate, and soil, from locations of suspected hazardous conditions. Surveying of both existing and new monitoring wells also will be conducted.

Because of the increased health and safety hazards associated with work at a potential hazardous waste site, it is imperative that this plan be understood and implemented. Compliance with this Health and Safety Plan is essential, and can be accomplished only with a dedicated effort in educating the workers. For this reason, NUS has developed a pre-job training program for subcontractors.

## 2.0 TRAINING OF SUBCONTRACTOR

Potentially hazardous waste sites, by their very nature, require extraordinary precautions to prevent loss of life, injury, or health hazards to any personnel on site. Clearly, every safety hazard associated with a potentially hazardous waste site can not be anticipated; and accordingly, rules cannot be developed for every contingency that could arise. However, in order to provide guidance to field personnel, i.e., the subcontractor, and to minimize the risks associated with field operations, a training program has been developed by NUS Corporation.

The following topics will be covered in the training session for the subcontractor:

- **Film presentation including**
  - **Introductory - Chemical and Physical Hazards**
  - **Introductory - Toxicology**
  - **Introductory - Hazard Control**
  - **Introductory - Air Purifying Respiratory Protection**
  - **Introductory - Self-Contained Breathing Apparatus (SCBA)**
- **Cherry Point Health and Safety Work Plan including**
  - **Chemical Hazards and Routes of Exposure**
  - **Monitoring and Operating Procedures**
  - **Protective Clothing Requirements**
  - **Respiratory Protection Requirements**
  - **Decontamination**
  - **Site Operations Chain-of-Command**
  - **Questions and Answers**
  - **First-Aid and Emergency Medical Treatment**
- **Respirator Work Shop including**
  - **Inspection**
  - **Cartridge Selection**
  - **Donning**
  - **Fit Checking (Pressure Test)**

- Individual fitting and leak checking of an Ultratwin Respirator using isoamyl acetate and irritant smoke
- Introduction to SCBA

Prior to the start of any work on site, each subcontractor employee must present a physician's physical examination verification, prior to the start of work, stating that the employee is physically capable of doing the work associated with this project and is medically fit to wear respiratory protection while working. This requirement is based on the Occupational Safety and Health Administration (OSHA) Safety and Health Standard (29CFR1910.134(a)10) stating:

Persons should not be assigned to tasks requiring use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. The local physician shall determine what health and physical conditions are pertinent. The respirator user's medical status should be reviewed periodically [for instance, annually].

It is the responsibility of all personnel to observe and check for safety equipment and practices of fellow workers. The Field Team Leader is responsible for adherence to this Health and Safety Plan.

### 3.0 PREVIOUS MONITORING/SITE IDENTIFICATION AND HISTORY

Based on information gathered from the Initial Assessment Study (IAS) prepared by Water and Research, Inc., on the Marine Corps Air Station, Cherry Point, North Carolina Site, there were 32 sites monitored, none of which have been determined to be an immediate threat to human health or the environment. Although 14 sites warranted further investigation under the NACIP Program, in order to identify suspected contamination, the type of monitoring equipment was not identified in the study, although several areas on site have leachate.

In October 1984, a Site Reconnaissance was performed at the Cherry Point Site by the NUS Corporation. During the Site Reconnaissance, groundwater monitoring wells, surface water, sediment, and soil sample locations were staked-out for the 14 sites requiring further investigation. Also, monitoring was done with the use of

an HNU (photo ionization detector), explosimeter, O<sub>2</sub> meter, radiation mini-alert, and the use of Drager tubes. Of the 14 sites monitored, four sites showed minor indications of organic vapors above background levels with the use of an HNU. The other 10 sites showed no levels above background.

Site 10 - While monitoring a cluster of existing wells, low levels of organic vapors of 1 part per million (ppm) above background were indicated with the HNU.

Site 5 - At the loading and unloading point of the waste POL tank, indications with an HNU showed 50 ppm above background. The reading was taken at the end of the hose for loading and unloading of a tank. No other indications were measured.

Site 13 - Background levels at this site were .2 ppm, and at the storm drain location, an indication of 1 ppm above background was shown on HNU.

Site 17 - This site is a chemical waste storage area. The entire site showed levels of 1-3 ppm above background with the use of an HNU. Some of the chemicals being stored were identified as containing nickel, sulfate, cyanide, lube oil, and zinc chromates.

#### Site Identification and History

Site 1 - The Borrow Pit/Landfill was originally a borrow area and was reported to have unidentified chemical waste.

Site 2 - The Borrow Pit/Dump Site contains waste presumed similar to waste at Site 1.

Site 4 - At the Borrow Pit/Landfill (north of Runway 14) there is a reasonable potential that waste sludges have been disposed here. Metal containers have been observed at this site.

Site 5 - Contaminated Petroleum, Oils, and Lubricants (POLs) are held in the two storage tanks No. 1771 and No. 1129 prior to offsite disposal. There is evidence of spills having occurred.

Site 6 - The Fly Ash Pond was a disposal area for fly ash and cinders from the old power plant. Since December 1980, lime aluminum sludge from the potable water treatment plant has been put here.

Site 7 - Indications are that the incinerator located here did not function properly and that waste was dumped and open burned or filled in the area.

Site 10 - The Old Sanitary Landfill is the main disposal site on the station. Hazardous wastes and POLs have been stored and buried here. Monitoring well data at the site show some contamination from both metals and organics. In March 1982, seepage of brown water with an oily appearance was observed.

Site 13 - POL contamination has been detected in the soil at Tank Farm "A." There is a possibility of POL leakage.

Site 15 - At this ditch, there is evidence of limited dumping of solid waste material and sludge (observed in March 1983).

Site 16 - There were personal recollections of up to 20,000 gallons of oil and one or more drums of potassium cyanide being disposed at the landfill at Sandy Branch.

Site 17 - At the defense property disposal office storage area, transformers containing PCBs were reportedly drained into a ditch adjacent to the railroad. Approximately 10,000 gallons of transformer oil were channeled into the ditch.

Site 19 - At the Borrow Pit/Landfill used for dumping or landfilling, fly ash from the steam plant and wastes from the NAVAIWORKFAC may have been disposed.

Site 21 - Small amounts of oily-type materials were observed seeping into a roadway ditch in the Borrow Pit/Landfill area.

#### 4.0 LEVELS OF PROTECTION/PERSONAL PROTECTIVE EQUIPMENT

Personnel must wear protective equipment when work activities involve known or suspected atmospheric contamination; when vapors, gases, or particulates may be generated; or when direct contact with skin-affecting substances may occur. Respirators can protect the lungs, the gastrointestinal tract, and the eyes against air toxicants. Chemical-resistant clothing can protect the skin from contact with skin-destructive and absorbable chemicals. Good personal hygiene limits or prevents ingestion of material.

Equipment to protect the body against contact with known or anticipated chemical hazards has been divided into four categories according to the degree of protection afforded. A general description of these four levels of protection are generally described below. More specific data can be referenced in the NUS Corporation Health and Safety Manual, Section 10, parts 5.3.1 through 5.3.4.

##### Level A

This level should be worn when the highest level of respiratory, skin, and eye protection is needed.

##### Level B

This level should be worn when the highest level of respiratory protection is needed but a lesser level of skin protection is required. Level B protection is the minimum level of protection to be worn when contaminants have not been identified.

##### Level C

This level should be worn when the types of airborne substances are known, the concentrations measured, and the criteria for using air-purifying respirators are met.

**Level D**

This level should not be worn on any site with respiratory or skin hazards. It is primarily a work uniform.

The level of protection selected is based primarily on the following types of information:

- Types and measured concentrations of chemical substances in the ambient atmosphere and their toxicity.
- Potential for or measured exposure to substances in air, splashes of liquids, or other direct contact with material due to work being performed.

The levels of protection for each site and for the work associated with each site are depicted in Section 5.0 of this safety plan entitled Health and Safety Requirements for Each Site.

**5.0 HEALTH AND SAFETY REQUIREMENTS FOR EACH SITE**

There are certain safety requirements that will apply to all sites while drilling and sampling activities are in progress. Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in any area designated as potentially contaminated. Hands must be thoroughly washed upon leaving the work area and before eating and/or drinking. This can be done at the decontamination area set up at each site. A first-aid kit will be available at each site and will also include, for example, an eye wash kit.

In the event that continuous air monitoring using a photoionization detector shows any organic vapors above background in the breathing zone and the substance cannot be identified, the team leader is to recall all personnel from that site and consult with the health and safety officer for a determination as to whether to

resume activities or move off site. During the interim, the plan for the field people will be to move off that particular site and continue work at another site. The site in question will be evaluated by the health and safety officer for the possibility of upgrading the level of protection prior to restarting of work at that site.

The following includes the level of respiratory protection, field dress, and any additional safety requirements for each specific site:

**Sites 1 and 2**

**Respiratory Protection:** Level D protection is required while working on these sites. No respirator is needed.

**Field Dress:** Steel-toe/shank work boots, butyl rubber (tingley) boot covers, white tyvek coveralls, surgical inner gloves, butyl outer gloves, and hard hat are required.

**Additional Safety Requirements:** No special requirements for these two sites are needed, but continuous air monitoring using a photoionization detector and explosimeter is required during drilling.

**Site 4**

**Respiratory Protection:** Level D protection, but no respirator, is required.

**Field Dress:** Steel-toe/shank work boots, butyl rubber (tingley) boot covers, white tyvek coveralls, surgical inner gloves, butyl outer gloves, and hard hat will constitute the uniform.

**Additional Safety Requirements:** Hearing protection is required when working on this site near the runway. Ear plugs will be sufficient, and muffs will not be required. Continuous air monitoring, as described for sites land 2 must be conducted.

**Site 5**

**Respiratory Protection:** Level D protection, but no respirator, is required.

**Field Dress:** Steel-toe/shank work boots, butyl rubber (tingley) boot covers, white tyvek coveralls, surgical inner gloves, butyl outer gloves, and hard hat are required.

**Additional Safety Requirements:** Monitoring is of the utmost of importance on this site, and it is necessary to keep as far as possible from the storage tanks. Any readings in the work location above background must be evaluated. The open pit 4 feet x 3-1/2 feet in diameter and located to the left of Tank #1129, must be roped off while working in this area. The utilities must be checked prior to any drilling on site.

**Site 6**

**Respiratory Protection:** Level D protection, but no respirator, is required.

**Field Dress:** The same dress as that specified under Site 5 is required.

**Additional Safety Requirements:** The lime alum sludge on the inbound side of the site must be avoided, and work locations should be monitored. The utilities must also be checked at this site prior to any drilling. Air monitoring must be performed during drilling, as previously described.

**Site 7**

**Respiratory Protection:** Level D protection, but no respirator, is required.

**Field Dress:** The same dress as that specified under Site 5 is required.

**Additional Safety Requirements:** Continuous air monitoring must be conducted while drilling and when taking surface water samples to evaluate the need for PVC coveralls.

**Site 10**

**Respiratory Protection:** Level D protection, but no respirator, is required.

**Field Dress:** The same dress as that specified under Site 5 is required.

**Additional Safety Requirements:** Proper air monitoring at existing well locations prior to sampling must be conducted, for this is the largest and oldest landfill on site. In very moist areas, the need for PVC coveralls must be evaluated. There is the possibility that a sewer

line is present on this site near the 10-GW-12 well. The Cherry Point drawings should be referred to prior to drilling.

**Site 13**

**Respiratory Protection:** Level D protection, but no respirator, is required.

**Field Dress:** The same dress as that specified under Site 5 is required.

**Additional Safety Requirements:** All activities must be coordinated with the Cherry Point operations group prior to the start of work at this site. Drawings for drilling locations and underground electrical and high-pressure lines on site must be referred to. Operations staff must be present when the drill rig is moved on this site. The drill rig must be grounded with a 10- to 20- foot ground stake when drilling. Jim Tooker from Cherry Point, (extension 3153 or 3942) will coordinate all samples needed of JP5, MOGAS, and Diesel. Disposable ear plugs are required. Air monitoring is required during drilling.

**Site 15**

**Respiratory Protection:** Level D protection, but no respirator, is required.

**Field Dress:** The same dress as that specified under Site 5 is required.

**Additional Safety Requirements:** Operations staff at Cherry Point must be contacted prior to start of work. To assure that there are no problems with drilling near the helicopter landing pad, NARF should be contacted. Hearing protection and disposable ear plugs are required. Air monitoring during drilling is required.

**Site 16**

**Respiratory Protection:** Level D protection, but no respirator, is required.

**Field Dress:** The same dress as that specified under Site 5 is required.

**Additional Safety Requirements:** The location of water and sewer lines at 16-6W-01 well must be ascertained prior to drilling the well. Drums located on site did not pose problems during the site reconnaissance. Proper air monitoring will be required.

**Site 17**

**Respiratory Protection:** Level D protection, but no respirator, is required.

**Field Dress:** The same dress as that specified under Site 5 is required.

**Additional Safety Requirements:** Continuous air monitoring must be done while taking samples at these sites. It may also be necessary to use Drager tubes if use of the HNU

indicates that there are any concentrations above background levels. Ear plugs are required.

**Sites 19 and 21**

**Respiratory Protection:** Level D protection, but no respirator, is required.

**Field Dress:** The same dress as that specified under Site 5 is required.

**Additional Safety Requirements:** Lt. Col. H.G. Hutchinson, Airfield Operations Officer, must be contacted at Ext. 2832 prior to start of work. Site work may have to be conducted on the weekend, in order to avoid working on an active runway. Hearing protection is required while working on this site. Lt. Col. Hutchinson and the NUS team leader will coordinate drill rig acquisition and transport of personnel to the site. Air monitoring during drilling is required.

At every site, proper monitoring procedures must be followed. If there is any detection of organic vapors, the need to upgrade the level of protection being used must be assessed.

**6.0 SUSPECTED SUBSTANCES ON SITE**

Select sampling has been done, and the following compounds are confirmed present or anticipated. Potential health effects are also included.

- **PCBs** - PCBs are bioaccumulative and carcinogenic and will penetrate clothing and skin.
- **Potassium Cyanide (KCN)** - The chlorates and KCN will explode when heated.
- **Phenol** - The permissible exposure limit is 5 ppm, IDLH=100 ppm. Target organs include the liver, kidneys, and skin. Phenol will cause irritation to eyes, nose, and throat if inhaled and will cause muscle aches and pains.
- **Methylene Chloride** - The permissible exposure limit is 500 ppm, IDLH (Immediately Dangerous to Life or Health) = 5000 ppm. Target organs include the skin, eyes, and central nervous system. This compound will cause fatigue, weakness, and sleepiness and the person will become light headed if the compound is inhaled. Methylene chloride has a low flammability rating.
- **Solvents** - These substances or organic liquids used to dissolve other organic materials, of which some are flammable. Mineral spirits, a solvent, has a permissible exposure limit of 500 ppm (IDLH = 5000 ppm). Target organs are the skin, the eyes, the respiratory system, and the central nervous system, which includes the brain and spinal cord.
- **P.O.L. (Petroleum, Oil, Lubricants)** - If detected, these substances may be toxic and/or flammable based on the concentration levels.
- **Methane** - Commonly found in waste sites, methane is very combustible, and displaces O<sub>2</sub> in the air. The lower explosive limit in air is 5 percent by volume.

**Note:** Special equipment will be used to determine the presence of these substances (see monitor procedures). Based on the concentration, special clothing and respiratory protection may be necessary. In addition to the

chemicals noted above, a more complete listing of chemicals found on the site during Round 1 sampling is included in Section 11.0 "Round 1 Sampling Results".

## **7.0 MONITORING PROCEDURES, SITE MONITORING EQUIPMENT, AND METHODS FOR SURVEILLANCE**

Personnel on all sites will be required to use the same monitoring procedures throughout the duration of the project. Since the potential for contamination at each site is primarily the same, the following monitoring equipment will be used at each site for detection of any release of organic vapors while new groundwater monitoring wells are being drilled and while sampling is being conducted.

Monitoring equipment to be used includes the following:

- HNU - Portable photoionization detector, gives a quantitative characterization of compounds.
- Drager Tube and Pump - Colorimetric tubes give readings in ppm for various specific compounds.
- TLD Badges (NUS Personnel only) - Thermoluminescent dosimeters, used to measure beta, gamma, and thermal neutron doses. Badges are read quarterly by outside vendors.
- Radiation Mini-Alert - Detects very low levels of radiation. Set at .1 to .3 mr/hr, an alarm will sound if radiation level exceeds .3 mr/hr.
- Explosimeter - Detects and measures the presence of combustible gasses or vapors.

- HCN detector - Detects the presence of HCN on a real-time basis. The unit gives both an audible alarm and digital readout.
- O<sub>2</sub> Meter - Detects levels of oxygen found in air. If less than 19.5 percent O<sub>2</sub> is present, an alarm will sound.

### Method of Surveillance

For all drilling operations, continuous monitoring with the use of an HNU (photoionization detector) will be conducted. If there are any detectable measures of organic vapors above background, the Drager tube will be used and the well pumped so that the substance can be identified. If the substance cannot be identified and the concentrations are above background in the breathing zone on an HNU, the level of protection must be upgraded, based on the TLV of the worst substance suspected. The explosimeter must be used during drilling to determine whether there are any flammable or combustible substances present. If a constant reading of a 10 percent Lower Explosive Limit (LEL) on the explosimeter is displayed, use extreme caution and back off. If a constant reading of 20 percent LEL on the explosimeter is displayed, all work must stop and all personnel are to leave the area. If any readings below 19.5 percent oxygen are indicated on the O<sub>2</sub> meter, there is to be no work allowed without supplied air (SCBA).

At each drilling location one person shall be equipped with a radiation mini-alert set at .1 to .3 mr/hr. If the radiation level increases to above .3 mr/hr, an assessment must be done prior to continuation of work.

For all sampling tasks, each sample location shall be checked with the use of an HNU. Any detectable measures above background must be evaluated prior to taking the sample.

For all drilling tasks, one person shall be equipped with a hydrogen cyanide detector. In addition, sampling activities at Site 16 will also require the use of this piece of equipment.

## 8.0 DECONTAMINATION AND DISPOSAL

Personnel working at a potentially hazardous waste site may become contaminated in a number of ways, including:

- Contacting vapors, gases, mists, or particulates in the air
- Being splashed by materials while sampling or opening containers
- Walking through puddles of liquids or walking on contaminated soil
- Using contaminated instruments or equipment

Protective clothing and respirators help prevent the wearer from becoming contaminated or inhaling contaminants, whereas good work practices help reduce contamination on protective clothing, instruments, and equipment.

Even with these safeguards, contamination may occur. Harmful materials can be transferred into clean areas, exposing unprotected personnel. Or in removing contaminated clothing, personnel may contact or inhale contaminants on the clothing. To prevent such occurrences, there are four levels of decontamination. Each level works in conjunction with the level of respiratory protection.

### Level A

Level A decontamination includes segregated equipment drop, boot cover and glove wash, boot cover and glove rinse, tape removal, boot cover removal, outer glove removal, suit and hard hat removal, SCBA backpack removal, inner glove wash, inner glove removal, inner clothing removal, field wash, and redress.

### Level B

Level B decontamination includes segregated equipment drop, boot cover and glove wash, boot cover and glove rinse, tape removal, boot cover removal, outer glove removal, suit/safety removal, SCBA backpack removal, inner glove removal, inner clothing removal, field wash, and redress.

**Level C**

Level C decontamination includes segregated equipment drop, boot cover and glove wash, boot cover and glove rinse, tape removal, boot cover removal, outer glove removal, suit/safety boot wash, suit safety boot rinse (canister or mask change), safety boot removal, splash suit removal, inner glove wash, inner glove rinse, facepiece removal, inner glove removal, inner clothing removal, field wash, and redress.

**Level D**

Level D decontamination includes segregated equipment drop, boot and glove wash, and boot and glove rinse.

Based on the contamination levels, Level "D" decontamination will be utilized for the drilling and sampling at the Cherry Point, North Carolina Site. If the level of respiratory protection is upgraded, the level of decontamination must also be upgraded.

Prior to the start of work at each site, a decontamination station must be set up for that particular site. This will avoid transfer of contaminants from a potentially contaminated area into a clean area.

The Cherry Point, North Carolina Marine Corps Air Station will handle the disposal of all potentially contaminated material and protective clothing. Disposal materials must be double bagged and secured on site. This task must be coordinated with the Cherry Point contact, Gary Edwards, at Ext. 3631 or 4186. If disposal items are determined to be nonhazardous, arrangements will be made to dispose of them at a permitted sanitary landfill. If disposal items are determined to contain potential hazardous waste, they will be disposed at the D.P.D.O.

## 9.0 EMERGENCY PROCEDURES AND INFORMATION

Part of the overall planning of onsite activities includes managing medical emergencies. The onsite team leader is responsible for ensuring that the following items are provided for:

- Training of all onsite personnel in the site-specific Health and Safety Plan.
- Training for at least one member of the onsite personnel in first aid and CPR.
- Ensuring that arrangements have been made with the nearest medical facility for transportation and treatment of the injured and for treatment of personnel suffering from exposure to chemicals. Also, all access routes must be mapped out for each site in order to get medical attention to a site the quickest way possible. This must be done prior to the start of work on any site.
- Consultation services with a toxicologist.
- Emergency eye wash.
- Provision of onsite first-aid kits.

Emergency first-aid treatment is only to be administered by trained individuals as a means of providing relief from injury and preventing further damage until professional treatment can be obtained.

The following is a list of some of the most common first-aid cases found in this type of operation. This list should be used as a reference guide in case of an accident.

When working at a potentially hazardous waste site, there is always the likelihood of a chemical exposure. Exposure to chemicals can be divided into two categories:

- Injuries from direct contact, such as acid burns or inhalation of toxic chemicals.
- Potential injury due to gross contamination on clothing or equipment.

For the contaminant inhaled, treatment can only be administered by a qualified physician. If unconscious, the victim should be pulled from the contaminated area immediately. Rescuers must wear appropriate respiratory and protective equipment. If the contaminant is on the skin or in the eyes, immediate measures must be taken to counteract the effect of the substances. First-aid treatment usually involves flooding the affected area with water; however, for a few chemicals, water may cause more severe problems. If at all possible, grossly contaminated clothing should be removed or decontaminated, in order not to cross-contaminate personnel administering treatment.

Should a toxic material be ingested, consult a physician to determine whether vomiting should be induced. If so, use a tablespoon of salt in a glass of warm water. Vomiting may also be induced by placing a finger down the throat of the victim. Treatment should continue until vomit is clear.

In the event of injury to or exposure to any field personnel, the onsite team leader will be responsible for the preparation and submission of an incident report to the Marine Corps Air Station, Natural Resources and Environmental Affairs (NREA) and Paul Rakowski in Norfolk, VA. A copy of an incident report is provided at the end of this section.

**Emergency Information and Telephone Numbers****Local Resources**

Ambulance:	Onsite Emergency	3333
Hospital:	Carteret Medical Center	274-1616
Police:	On base Cherry Point	3960
Fire Dept.:	On base Cherry Point	3333
Site Security	On site	3960
Gary Edwards:	NREA Contact	3631/4186
Skip Conklin:	Utilities	2858
Lt. Col H.G.Hutchinson:	Airfields ops.	2233/2671
Maj. D.K. Brooks:	Public Affairs Officer	4241/2536
Paul Rakowski:	Supervisory Environmental Engineer	804-444-9562
Cheryl Barnett	Supervisory Environmental Engineer	804-444-9566
Lt. Commander Bates:	MCAS Occupational & Environmental Health	5241

**Office Resources**

NUS Pittsburgh Office	412-788-1080
Manager Health & Safety - Gary Smith (Home)	412-695-3667
Assistant Health & Safety Contact Jack Peterson (Home)	412-653-6825
Project Manager - Vicki Pierce (Home)	412-741-1215

**Emergency Contacts (Medical and Health)**

Dr. Parkinson (NUS Consulting Physician)	
(Office)	412-624-0127
(Home)	412-963-0875
Poison Control Center (Pittsburgh)	412-681-6669
National Response Center (Environment Emergency Only)	800-424-8802

As part of this procedure, LT. Commander Bates, MCAS Occupational and Environmental Health officer, should be contacted daily at extension 5241 on base

and informed of the sites on which work will be in progress for that day. Also, should there be any questions concerning operations at Cherry Point, refer them to Major D.K. Brooks Joint Public Affairs Officer, at Ext. 4241 or 2536. He will answer the questions that they have.

The hospital is located on Route 70 in Morehead, North Carolina, Carteret Medical Center.

**Directions**

When leaving the site, make left at the main gate (Route 70) and follow Route 70 to Morehead. The hospital is located approximately 6 miles away on the left side of road. A map of the base with the fastest route to the hospital will be developed for each specific site. This map will be available at each site while site work is being conducted.

**10.0 NUS Personnel and Responsibilities**

**Personnel**

**Responsibilities**

Vicki Pierce	Project Manager
Gary C. Beswick	Health and Safety
Jim Ferguson	Geologist
Bill Wells	Field Operations/ Team Leader
Carl Ketchem	Field Operations
Bob Lucas	Surveying/Team Leader
Gary Waugh	Surveyor

## 11.0 ROUND 1 SAMPLING RESULTS

This section illustrates the results gained from the round one sampling efforts conducted by NUS from January 6 through 15, 1985. In addition, the section also describes some of the known toxic effects of the chemicals found during the sampling.

### Acute Toxicity

The acute toxicity data reported in Tables B-1 through B-7 are taken from the Registry of Toxic Effects of Chemical Substances (RTECS) published by the National Institute for Occupational Safety and Health. These data are not standards or criteria, but give a relative indication of the acute toxicity of the pure chemical.

The toxic dose data include, in sequence, the route of exposure; the species of animal studies; the toxicity measure; and the amount of substance per body weight unit. The route of exposure used here is oral, i.e., the chemical is introduced through the food or drinking water of the animal. The adult rat is the animal studied. (A few chemicals have oral-route human study data. That information is presented when available.) The lethal dose (LD) is used as the toxicity measure. Specifically, the LD<sub>50</sub> is presented. LD<sub>50</sub> is a calculated dose of a substance which is expected to cause the death of 50 percent of an entire defined experimental animal population. (LD<sub>L0</sub>, the lowest dose of a substance over any given period of time in one or more divided portions that is reported to have caused death in humans or animals, is presented in conjunction with the oral-route human data.)

### Acceptable Daily Intakes

Acceptable Daily Intakes (ADIs) are defined as the "the amount of toxicant in mg/day (70/kg person) which is not anticipated to result in adverse effects after

**TABLE B-1**  
**MCAS, CHERRY POINT**  
**CONFIRMATION STUDY**  
**ROUND 1 SAMPLING**  
**SITE NO. 4**

Site No. 4

Constituent	Sample Number			Chemical Toxicity Parameters				
	4GW01	4GW04	4GW05	Acute Tox. mg/kg(1)	Chronic Toxicity ADIs (mg/day)(2)	Health Advisory SHARLS (ug/l)(3)	Dermal Absorption and Toxicity(4)	AWQC (5)
Chloroform (ug/l) CAS No. 67-66-3	6 (5)			oral rat LD50-908	---	---	---	0.19 ug/l*
1,2-Trans-Dichloroethylene (ug/l) CAS No. 127-18-4		33		---	---	1 day-2,700 10 day-270	---	---
Trichloroethylene (ug/l) CAS No. 79-01-6		71 (5)		oral hmn LDLO-7,000 oral rat LD50-7193	---	1 day-2,020 10 day-200 long term-75	---	2.7 ug/l*
Vinyl chloride (ug/l) CAS No. 75-01-4		57 (5)		oral rat LD50-500	---	---	High penetration (gas). Extreme systemic and local potency (gas).	2.0 ug/l*
1,1-Dichloroethane (ug/l)			68	oral rat LD50-670 oral hmn LDLO-428	8.1	---	---	---

NOTE: Samples analyzed for specific conductance, pH, total organic halogens, total organic carbon, phenolics, metals: Cu, Cr, Pb, Zn, Cd, Ni, Ag, and volatile organics. Blank space indicates that the contaminant was not found above detection limits.

\* Indicates that the substance is identified as a potential carcinogen and the ambient water concentration should be zero based on the non-threshold assumption for this chemical. Since zero level may not be attainable at the present time the level which may result in an incremental increase of cancer risk of 0.000001 is tabulated.

B-24

CP-00348-03.05-10/01/85

TABLE B-2

MCAS, CHERRY POINT  
CONFIRMATION STUDY  
ROUND 1 SAMPLING  
SITE NO. 5

Site No. 5

Constituent	Sample Number						Chemical Toxicity Parameters				
	56W02	56W03	56W04	56W05	56W06	55W01	Acute Tox. mg/kg (1)	Chronic Toxicity ADIs (mg/day) (2)	Health Advisory SNARLS (ug/l) (3)	Dermal Absorption and Toxicity (4)	AWQC (5)
1,1-Dichloroethane (ug/l) CAS No. 75-34-3	7						oral rat LD50-670 oral hmn LDLO-428	8.1	---	---	---
Oil (mg/l)		2.1	2.1	2.4	8.7	4.2	---	---	---	---	---

B-25

NOTE: Samples analyzed for PCB, oil and grease, phenolics, Pb, specific conductance, pH, total organic halogens and total organic carbon. The petroleum, oil and lubricant layer in the groundwater was measured. Blank space indicates that the contaminant was not found above detection limits.

CP-00348-03:05-10/01/85

TABLE B-3

MCAS, CHERRY POINT  
CONFIRMATION STUDY  
ROUND 1 SAMPLING  
SITE NO. 7

Site No. 7

Constituent	Sample Number	Chemical Toxicity Parameters				
		Acute Tox. mg/kg (1)	Chronic Toxicity ADIs (mg/day) (2)	Health Advisory SNARLS (ug/l) (3)	Dermal Absorption and Toxicity (4)	ANQC (5)
Chlorodibromomethane (ug/l) CAS No. 124-48-1	97 (2)	oral rat LD50-848	0.036	- - -	- - -	- - -
Chloroform (ug/l) CAS No. 67-66-3	38 (5)	oral rat LD50-908	- - -	- - -	- - -	0.19 ug/l*
Dichlorobromomethane (ug/l) CAS No. 75-27-4	6	oral rat LD50-916	0.039	- - -	- - -	- - -
1,1,1-Trichloroethane (ug/l) CAS No. 71-55-6	7	oral hmn LDLO-670 oral rat LD50-10,300	38	- - -	Moderate penetration (liquid). Moderate local and systemic potency (liquid)	18.4 mg/l

NOTE: Samples analyzed for specific conductance, pH, total organic halogens, total organic carbon, phenolics, metals: Cr, Pb, Zn, Cd, Ni, and Ag, and volatile organics. Blank space indicates that the contaminant was not found above detection limits.

\* Indicates that the substance is identified as a potential carcinogen and the ambient water concentration should be zero based on the non-threshold assumption for this chemical. Since zero level may not be attainable at the present time the level which may result in an incremental increase of cancer risk of 0.000001 is tabulated.

B-26

CP-00348-03.05-10/01/85

TABLE B-4

NEAS, CHERRY POINT  
CONFIRMATION STUDY  
ROUND 3 SAMPLING  
SITE NO. 10

Site No. 10

Constituent	Sample Number										Chemical Toxicity Parameters						
	10EGM02	10EGM03	10EGM05	10EGM06	10EGM07	10EGM08	10EGM09	10GM10	10GM11	10GM12	10LW02	10LW04	Acute Tox. mg/kg (1)	Chronic Toxicity ADIs (mg/day)(2)	Health Advisory SMARLS (ug/l)(3)	Dermal Absorption and Toxicity (4)	AWQC (5)
Chloroethane (ug/l) CAS No. 76-00-3	14	15	2500	42			12										
1,1-Dichloroethane (ug/l) CAS No. 75-34-3	20	20	1000(2)	22	0		13					6	oral rat 1050-670 oral ham TDLO-428	8.1			
Tetrachloroethylene (ug/l) CAS No. 127-18-4	10 (6)								200 (3)(5)				oral rat 1050-8,850		1 day-2,300 10 day-175 long term-20		0.8 ug/l*
1,2-Trans-Dichloro- ethylene (ug/l) CAS No. 127-18-4	50	55	1900(3)	480 (3)	42		14	1300(3)							1 day-2,700 10 day-270		
Trichloroethylene (ug/l) CAS No. 79-01-6	17 (5)	5 (5)	410 (3)(5)	150 (3)(5)		550 (3)(5)			100 (3)(5)				oral ham TDLO-7,000 oral rat LD50-7,193		1 day-2,020 10 day-200 long term-75		2.7 ug/l*
Phenolics (ug/l) (phenol) CAS No. 108-95-2	0.40		0.17				0.04	0.17	0.02	0.06	0.02	0.02	oral rat 1050-384 (phenol)	7.0 (phenol)			3.5 mg/l (phenol) .3 mg/l organoleptic
Chlorobenzene (ug/l) CAS No. 108-90-7							5	63	9				oral rat 1050-2,910	1:0		Moderate penetration (liquid). Moderate local and systemic potency (liquid).	488 ug/l
Toluene (ug/l) CAS No. 108-88-3							67	1100		120			oral rat 1050-5,000	30	1 day-21,500 10 day-2,200 long term-340	Slight penetration (liquid). Slight systemic and local potency (liquid).	14.3 ug/l
Vinyl Chloride (ug/l) CAS No. 75-01-4							35 (5)	2600(5)					oral rat 1050-500			High penetration (gas). Extreme systemic and local potency (gas).	2.0 ug/l*
Benzene (ug/l) CAS No. 71-43-2							130 (3)(5)	11 (5)					oral rat 1050-5,200		1 day-230 long term-70	Moderate penetration (liquid). Moderate local potency and extreme systemic potency (liquid).	0.64 ug/l*
Ethyl Benzene (ug/l) CAS No. 108-41-4							35			37			oral rat 1050-3,500	9.5		Moderate penetration (liquid). Moderate local and systemic potency (liquid).	1.4 mg/l

NOTE: Samples analyzed for specific conductance, pH, total organic halogens, total organic carbon, phenolics, metals: Cu, Cr, Pb, Zn, Cd, Ni, and Ag, and volatile organics. Blank space indicates that the constituent was not found above detection limits.

\* Indicates that the substance is identified as a potential carcinogen and the ambient water concentration should be zero based on the non-threshold assumption for this chemical. Since zero level may not be attainable at the present time the level which may result in an incremental increase of cancer risk of 0.00001 is tabulated.

B-27

CP-00348-03.05-10/01/85

TABLE B-5

MCAS, CHERRY POINT  
CONFIRMATION STUDY  
ROUND 1 SAMPLING  
SITE NO. 13

Site No. 13

Constituent	Sample Number							Chemical Toxicity Parameters				
	13GM01	13GM02	13GM03	13GM04	13GM05	13GM06	13GM07	Acute Tox. mg/kg(1)	Chronic Toxicity ADIs(mg/day)(2)	Health Advisory SMAALS (ug/l)(3)	Dermal Absorption and Toxicity(4)	Ambient Water Quality Criteria(5)
Benzene (ug/l) CAS No. 71-43-2	31 (5)		23 (5)	28 (5)				oral rat LD50-4,894	---	1 day-230 long term-70	Moderate penetration (liquid). Moderate local and systemic potency (liquid).	0.66 ug/l*
Chloroform (ug/l) CAS No. 67-66-3	7 (5)							oral rat LD50-908	---	---	---	0.19 ug/l*
Ethylbenzene (ug/l) CAS No. 100-41-4	14		72	73				oral rat LD50-3,500	9.5	---	Moderate penetration (liquid). Moderate local and systemic potency (liquid).	1.4 mg/l
Toluene (ug/l) CAS No. 108-88-3	21		18					oral rat LD50-5,000	30	1 day-21,500 10 day-2,200 long term-340	Slight penetration (liquid). Slight local and systemic potency (liquid).	14.3 mg/l
1,2-Trans-dichloro- ethylene (ug/l) CAS No. 156-60-5	8		18			6		---	---	1 day-2,700 10 day-270	---	---
Oil (mg/l)		69		2600	1.8	2.3	1.4					
1,1-Dichloro bromomethane (ug/l) CAS No. 75-27-4				8				oral rat LD50-916	0.039	---	---	---
JPS MATCH (fuel characterization)		X						---	---			

B-28

CP-00348-03.05-10/01/85

NOTE: Samples analyzed for oil and grease, and volatile organics. The petroleum, oil and lubricant layer in the groundwater was measured. Blank space indicates that the contaminant was not found above detection limits.

\* Indicates that the substance is identified as a potential carcinogen and the ambient water concentration should be zero based on the non-threshold assumption for this chemical. Since zero level may not be attainable at the present time, the level which may result in an incremental increase of cancer risk of 0.000001 is tabulated.

TABLE B-6

MCAS, CHERRY POINT  
CONFIRMATION STUDY  
ROUND 1 SAMPLING  
SITE NO. 16

Site No. 16

Constituent	Sample Number				Chemical Toxicity Parameters				
	16GW01	16GW02	16GW03	16GW04	Acute Tox. mg/kg(1)	Chronic Toxicity ADIs (mg/day)(2)	Health Advisory SNARLS (ug/l)(3)	Dermal Absorption and Toxicity(4)	AWQC(5)
1,1,2,2-Tetrachloro- ethane (ug/l) CAS No. 79-34-5	340 (3)(5)	12 (5)	75 (3)(5)		oral rat LD50-800 oral hmn LDLO-30	- - -	1 day-2,300 10 day-175 long term-20	- - -	0.17 ug/l*
Tetrachloroethylene (ug/l) CAS No. 127-18-4	8 (5)	7 (5)			oral rat LD50-8,850	- - -	1 day - 2,300 10 day-175 long term-20	- - -	0.8 ug/l*
1,2-Trans-Dichloro- ethylene (ug/l) CAS No. 156-60-5	120	86		2000(3)	- - -	- - -	1 day-2,700 10 day-270	- - -	- - -
Trichloroethylene (ug/l) CAS No. 79-01-6	150 (5)	72 (5)	97 (5)	410(5)	oral hmn LDLO-7,000 oral rat LD50-7,193	- - -	1 day-2,020 10 day-200 long term-75	- - -	2.7 ug/l*
Vinyl chloride (ug/l) CAS No. 75-01-4	19 (5)				oral rat LD50-500	- - -	- - -	High penetration (gas). Extreme local and systemic potency (gas).	2.0 ug/l*

NOTE: Samples were analyzed for specific conductance, pH, total organic halogens, total organic carbon, phenolics, metals: Cu, Cr, Pb, Zn, Cd, Ni, and Ag, and volatile organics. Blank space indicates that the contaminant was not found above detection limits.

\* Indicates that the substance is identified as a potential carcinogen and the ambient water concentration should be zero based on the non-threshold assumption for this chemical. Since zero level may not be attainable at the present time the level which may result in an incremental increase of cancer risk of 0.000001 is tabulated.

TABLE B-7

MCAS, CHERRY POINT  
CONFIRMATION STUDY  
ROUND 1 SAMPLING  
SITE NO. 17

Site No. 17

Constituent	Sample Number			Chemical Toxicity Parameters				
	17S01	17S03	17SD06	Acute Tox. mg/kg(1)	Chronic Toxicity ADIs (mg/day)(2)	Health Advisory SMARLS (ug/l)(3)	Dermal Absorption and Toxicity(4)	AWQC(5)**
PCB 1254+1260 (ug/g) CAS Nos. 11097-69-1 + 11096-82-5	5.9	1.7		oral rat LD50-1,315 +	- - -	1 day-125 10 day-12.5	- - -	0.79 ng/l*
PCB 1260 (ug/g) CAS No. 11096-82-5			1.1	oral rat ED50-1,315	- - -	1 day-125 10 day-12.5	- - -	0.79 ng/l*

NOTE: Samples were analyzed for PCBs. Blank space indicates that the contaminant was not found above detection limits.

\* Indicates that the substance is identified as a potential carcinogen and the ambient water concentration should be based on the non-threshold assumption for this chemical. Since zero level may not be attainable at the present time the level which may result in an incremental increase of cancer risk of 0.000001 is tabulated.

\*\* Water quality criteria are presented for general discussion, however, they do not correlate specifically with concentration levels detected in soils or sediments.

B-30

CP-00348-03.05-10/01/85

chronic exposure" (U.S. EPA, 1984). Assuming a 2-liter consumption of water per day, the calculated value gives an indication of the potential for toxic effects from long-term ingestion of the contaminant in water. ADIs are derived from human or animal studies and do not consider carcinogenic health risks.

### EPA Health Advisories

EPA Health Advisories or "Suggested No Adverse Response Levels" (SNARLS) are guidelines developed by the EPA Office of Drinking Water for non-regulated contaminants in drinking water (USEPA, 1984). Health Advisories are calculated to consider the effects of a substance on a 10-Kg child who consumes one liter of water per day for three exposure levels: 1 day, 10-day, and long-term (chronic). Health Advisories do not consider carcinogenic or synergistic effects.

If a contaminant exceeds the one-day limit, there is a potential for acute health effects from short-term ingestion. If a contaminant exceeds the 10-day limit, there is a potential for subchronic health effects associated with consumption. If a contaminant exceeds the long-term limit, there is a potential for chronic health impacts over long-term ingestion.

### Dermal Toxicity

Dermal toxicity data are taken from the Oil and Hazardous Materials Technical Assistance System (OHMTADS), which identifies approximately 350 chemicals as dermally active. The data are for the pure chemicals; mixtures of chemicals may have synergistic or antagonistic effects on the skin.

The toxicity descriptions discuss three areas of concern: skin penetration, systemic potency, and local potency. Skin penetration is described as either negligible, slight, moderate, or high. Systemic potency (lethal amount to a 70-kg man) is described as an extreme (tissue destruction/necrosis), moderate (irritation/inflammation of skin), or slight (reddening of skin).

These data, in conjunction with other site-specific knowledge, are useful for evaluating the potential for dermal toxic effects and in selecting protective clothing for activities at the site.

### Ambient Water Quality Criteria

Ambient Water Quality Criteria (AWQC) have been developed for 64 classes of toxic pollutants under the Clean Water Act (USEPA, 1980; USEPA, 1984). The criteria presented here represent ambient water concentrations that do not result in adverse effects in humans and the concentrations associated with incremental cancer risks.

Water quality criteria for non-carcinogens are calculated to reflect the ingestion of water and aquatic organisms (70-kg adult, two liters water and 6.5 g of aquatic organisms per day).

Water quality criteria for carcinogens are estimated water concentrations that correspond to incremental cancer risk levels. Ambient water quality criteria for carcinogens, which are tabulated in Tables B-1 through B-7, correspond to an incremental lifetime cancer risk of  $10^{-6}$  (i.e., one-in-one-million incremental increase in cancer risk over a lifetime).

Appendix C includes the field notes compiled during well sampling in January of 1985. Of particular importance are the OVA readings found during this effort.

**APPENDIX C**  
**ROUND 1**  
**TRIP REPORT**  
**JANUARY 6 THROUGH 15, 1985**

## TRIP REPORT

CHERRY POINT MCAS  
JANUARY 6 THROUGH 15, 1985  
PROJECT NO. 7095

TO: VICKI PIERCE

FROM: WILLIAM K. WELLS *W.K.W.*

APPROVAL: *Jim Ferguson*  
M. S. ULINTZ/J. J. WALSH *J.J.W.*

COPIES: D. THRELFALL  
G. F. SMITH  
M. J. GRADKOWSKI  
R. C. KETCHEM  
J. R. FERGUSON  
L. T. REITZ

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Introduction

Sampling was performed at the United States Marine Corps Air Station in Cherry Point, North Carolina. The sampling team included Bill Wells (team leader), Carl Ketchem (sampler), Jim Ferguson (sampler) with support from Larry Reitz (site geologist).

Scope of Work

The Scope of Work included the sampling of: 52 newly installed monitoring wells, 14 existing potable wells; 8 surface water points; 25 sediments, and 12 soil locations. Samples were also to be taken of JP-5; MOGAS, leaded, unleaded, and deisel fuels at Site 13. All metals samples were to be filtered before shipment to the NUS Laboratory. All monitoring wells were to be developed by F & R of Raleigh, North Carolina.

Field Operations

Sunday, January 6, 1985, the sampling crew traveled to Cherry Point, North Carolina. Bill Wells and Carl Ketchem arrived by ground transportation and Jim Ferguson by air.

Monday, January 7, 1985, the sampling crew met the drillers at 0730 hours at the site storage trailer. After reviewing the scope of work, the drillers were instructed as to their day's activities - setting forms at the monitoring wells for concrete pad and protective pipe installation. The sampling crew checked-in at the front gate for a temporary vehicle pass and proceeded to the NREA office on base. A storage area at NREA was acquired and equipment unloaded. The remainder of the day the sampling crew made a reconnaissance of the 14 sites, checked periodically with the drillers and shopped for the necessary supplies not brought from Pittsburgh.

CHERRY POINT MCAS  
PROJECT NO. 7095  
PAGE TWO

Tuesday, January 8, 1985, the sampling crew arrived at the site storage trailer at 0730 hours and waited approximately 30 minutes for the drillers to arrive to receive their instructions. Developed, purged, and sampled monitoring wells 1GW01, 1GW02, 1GW03, 2GW01, 2GW02, 7GW01, 7GW02; sampled 7SW01.

Wednesday, January 9, 1985, developed, purged, and sampled monitoring wells 4GW01, 4GW02, 4GW03, 4GW04, 4GW05, 19GW01, 19GW02, 21GW02, 21GW03, sample 4SW01.

Thursday, January 10, 1985, developed, purged, and sampled monitoring wells 21GW02, 21GW04, 21GW05, 13GW08, 13GW01, 13GW02, and 13GW07. Filtered and prepared samples for shipment.

Friday, January 11, 1985; developed, purged, and sampled monitoring wells 5GW01, 5GW02, 5GW03, 5GW04, 5GW05, 5GW06, 13GW03, 13GW04, 13GW05, 13GW06, 16GW01, 16GW02, 16GW03, 1GW04; sampled 5SW01 and 5SD01.

Saturday, January 12, 1985, developed, purged and sampled monitoring wells 10GW04, 10W09, 10GW10, 10GW11, 10GW12, 10EGW01, 10EGW02, 10EGW03, 10EGW05, 10EGW06, 10EGW07, 10EGW08, 10EGW13 (not sampled, well contained 0.40 foot of water), 6GW02. Sampled 10LW01, 10LW02, 10SW03, 10LW04, 10LW05, 10SO01, 10LS02, 10LS04, and 10LS05. Installed new locks on all existing monitoring wells on Site No. 10.

Sunday, January 13, 1985, developed, purged and sampled monitoring wells 6GW01, 6GW03, 6GW04, 15GW01, 15GW02, 15GW03, 15GW04, 15GW05, 15GW06; sampled 15SD01, 15SD02, 15SD03, 15SD04, 15SD05, 15SD06, 15SD07, 15SD08, 18SO1A, 18SO1B, 18SO1C, 18SO2A, 18SO2B, 18SO2C, 18SO3A, 18SO3B, 18SO3C, 18SO4A, 18SO4B, and 18SO4C.

Monday, January 14, 1985, sampled 10PW01, 10PW02, 10PW03, 10PW05, and fuels - JP-5, MOGAS - leaded, MOGAS - unleaded and diesel. Filtered, packed and shipped samples; packed truck for return to Pittsburgh and cleaned NREA storage area.

Tuesday, January 15, 1985, Bill Wells drove Carl Ketchem and Jim Ferguson to the Kinston, North Carolina Airport for their return to Pittsburgh. Bill Wells then drove to the Tybouts Landfill in New Castle, Delaware (465 total miles).

#### Changes - Scope of Work

The drillers, F & R of Raleigh, North Carolina was supposed to develop the 52 NUS monitoring wells on site. Instead they developed 6 wells and the sampling crew did the other 46 wells. They were using a hand pump that produced about 3 gallons per minute and had to be deconned after each usage, while the sampling crew, using a teal suction pump, could produce 10 to 12 gallons per minute. The sampling crew also used 3/4 inch or 1 inch polyethylene flexible tubing (9, 30 foot sections) and

CHERRY POINT MCAS  
PROJECT NO. 7095  
PAGE THREE

had to be deconned once a day. Wells developed by F & R are noted on the monitoring well data chart. Samples of 2 production wells, 10PW04 and 10PW06, were not taken. 10PW04 because the pump was under repair. 10PW04 will be in service for the second round of sampling and 10PW06 could be substituted with another production well in the vicinity. One existing well at Site No. 10, 10EGW13, was not sampled because it contained 0.40 foot of standing water. Three soil samples at Site No. 17 were not taken (17SO4, 17SO5, and 17SO6) because fill material has been placed in this area and the sample would not have been representative of the site. SCBA's were taken because of high OVA and HCN detector readings in some sites. While high OVA readings were recorded in monitoring wells (see monitoring well data sheet) 5GW03, 7GW02, 10GW09, 10GW11, 10EGW13, 16GW02, 16GW03, and 16GW04 the breathing zone and discharge water area readings were under the 6 ppm action level. HCN readings at Site No. 16 were 0 in all monitoring wells.

General Site Notes

Flourescent pink pin flags were placed at all surface water, leachate water, sediment and soil sample locations.

Site No. 1 and Site No. 2 Borrow Pit

1GW01 - Easy access from road  
1GW02 - Access road very wet and muddy  
1GW03 - Easy access from road  
2GW02 - Easy access from road  
2GW01 - Hand carry all equipment from 2GW02

Site No. 4 - Borrow Pit/Landfill North of Runway 14

All sampling locations are easily accessible.

Site No. 5 - Storage Tank for Waste POL (Petroleum, Oil, and Lubricants)

All sampling locations are easily accessible.

Site No. 6 - Fly Ash Ponds

All sampling locations are easily accessible. See Figure 2-5 for changes.

Site No. 7 - Old Incinerator and Adjacent Area

All sampling locations are easily accessible. Monitoring Well 7GW03 not installed. See Figure 2-5 for changes.

CHERRY POINT MCAD  
PROJECT NO. 7095  
PAGE FOUR

Site No. 10 - Old Sanitary Landfill

Monitoring well locations are easily accessible from dirt roads. The landfill area should not be driven on, as it is very soft in spots. Surface water, leachate soil, and leachate water sample points are flagged and accessibility should not be difficult for future sampling rounds. Warm weather will produce foliage, insects and snakes and caution should be taken in these areas. See Figure 2-7 for changes. Keys for production wells can be obtained from Mr. Hall at the water plant.

Site No. 13 - Tank Farm A

All monitoring wells are easily accessible. High OVA readings were recorded in 13GW02, 13GW03, 13GW04, and 13GW12. Discharge water from all 8 monitoring wells was containerized in 55 gallon drums. All wells had a strong petroleum odor with an oily residue on top.

Site No. 15 - Area and Ditch Behind NAVAIWORKFAC

All sampling locations are easily accessible.

Site No. 16 - Landfill at Sandy Branch

Monitoring wells are easily accessible. Discharge water from 16GW02, 16GW03, and 16GW04 was containerized in 55 gallon drums. HCN detector readings were 0 in all monitoring wells. 16GW01 can be hand bailed.

Site No. 17 - Defense Property Disposal Office (DPDO) Storage Area

All sampling locations are easily accessible. These locations are located in the DPDO compound. Access to the sampling points must be cleared with Connie Beasley, Area Manager, before sampling proceeds. Soil sampling points 17SO4, 17SO5, and 17SO6 because fill material placement in this area.

Site No. 18 - Facilities Maintenance Compound

All sampling points easily accessible on the east and west sides of Building No. 82.

Site No. 19 and Site No. 21 - Borrow Pit/Landfill

All sampling points are easily accessible. Access monitoring wells 19GW01, 19GW02, 21GW02, and 21GW03 must be cleared through the Crash Crew Commander for an escort across and around the runways. Monitoring wells 21GW01, 21GW04, and 21GW05 can be reached from Route 101 through a landfill area.

Access to all sampling areas was coordinated through the NREA office.

WKW:lld

Attachments

C-5

Well No.	Date Sampled	Time Sampled (hours)	Sampled By	OVA Reading (ppm)	Static Water Level (ft)*	Water Level At Sampling (ft)*	Sample Temp. (°C)	pH	Specific Cond.	Gallons Purged	Sample Color	Remarks
1GW01	1/8/85	0928	WKW/RCK	0	15.00	15.53	16	--	--	96	Cloudy	Developed by F & R
1GW02	1/8/85	1228	WKW/RCK	0	12.03	13.97	17	--	--	40	Clear	
1GW03	1/8/85	1318	JRF/RCK	0	8.00	8.52	17	--	--	80	Clear	
2GW01	1/8/85	1415	WKW/RCK	0	3.90	4.85	16	--	--	180	Clear	Developed by F & R
2GW02	1/8/85	1437	WKW/RCK	0	1.70	2.10	17	--	--	92	Cloudy	
4GW01	1/9/85	1140	WKW	0	11.02	12.25	17	--	--	--	Clear	
4GW02	1/9/85	1106	RCK/WKW	0	10.30	10.60	17	7.15	600	100	Cloudy	
4GW03	1/9/85	1030	WKW/JRF	3	10.27	10.37	17	7.04	600	80	Clear	
4GW04	1/9/85	0910	RCK/JRF	6	13.41	13.94	17	6.04	260	140	Iron Oxide	
4GW05	1/9/85	0955	WKW/RCK	3	15.12	15.32	18	6.16	710	100	Clear	
5GW01	1/11/85	1430	WKW/RCK	0	8.80	9.07	19	5.40	580	100	Clear	
5GW02	1/11/85	1515	WKW/RCK	0	5.10	5.23	17	6.40	700	70	Clear	
5GW03	1/11/85	1630	WKW/RCK	8	7.17	7.19	18	6.72	890	25	Clear	
5GW04	1/11/85	1530	WKW/RCK	0	7.65	7.93	19	8.81	260	25	Clear	
5GW05	1/11/85	1450	WKW/RCK	0	11.85	12.10	19	5.26	300	100	Clear	
5GW06	1/11/85	1600	WKW/RCK	4	9.80	10.17	18	6.05	560	100	Clear	
6GW01	1/13/85	0904	WKW/RCK	0	8.30	8.40	17	6.03	330	100	Clear	
6GW02	1/12/85	1650	WKW/RCK	0	--	--	17	7.02	320	80	Cloudy	Sampled after development by the Drillers (F & R)
6GW03	1/13/85	0845	RCK/JRF	0	5.80	6.07	18	5.79	580	80	Clear	
6GW04	1/13/85	0806	RCK/WKW	0	10.15	10.27	17	6.68	500	50	Clear	
7GW01	1/8/85	1654	WKW/RCK	0	2.95	2.95	14	6.17	510	100	Clear	
7GW02	1/8/85	1625	WKW/RCK	100	3.60	4.20	17	7.25	860	90	Cloudy	
10GW04	1/12/85	1203	RCK/JRF	0	--	--	17	6.80	640	100	Cloudy	Sampled after development by the drillers (F & R)
10GW09	1/12/85	1030	RCK/WKW	100	17.50	17.83	17	6.55	930	70	Clear	
10GW10	1/12/85	0915	RCK/JRF	0	15.00	15.52	17	6.63	1100	70	Clear	Sampled after development by the drillers (F & R)
10GW11	1/12/85	1000	RCK	100			17	6.60	1500	40	Cloudy	Sampled after development by the drillers (F & R)
10GW12	1/12/85	0848	JRF/RCK	0	16.63	16.67	17	6.50	1100	70	Cloudy	
10EGW01	1/12/85	1146	RCK/JRF	0	7.60	7.97	17	5.48	140	60	Clear	Total depth = 19.72'

CP-00348-03.05-10/01/85

C-6

Well No.	Date Sampled	Time Sampled (hours)	Sampled By	OVA Reading (ppm)	Static Water Level (ft)*	Water Level At Sampling (ft)*	Sample Temp. (°C)	pH	Specific Cond.	Gallons Purged	Sample Color	Remarks
10EGW02	1/12/85	1345	RCK/JRF	0	17.00	17.25	17	6.45	500	12	Clear	Total depth - 19.72' Hand bailed with stainless steel bailer
10EGW03	1/12/85	1330	JRF/WKW	0	14.00	14.57	17	6.44	510	100	Clear	Total depth - 20.77
10EGW05	1/12/85	1450	WKW/JRF	0	15.92	16.17	17	6.48	880	12	Cloudy	Total depth = 19.72'/Well No. 23 Hand bailed with stainless steel bailer
10EGW06	1/12/85	1530	WKW/JRF	0	15.92	16.01	17	6.65	300	20	Cloudy	Total depth = 33.33'/Well No Hand bailed with stainless steel bailer
10EGW07	1/12/85	1600	WKW/RCK	0	15.92	15.97	17	7.45	370	35	Cloudy	Total depth = 46.60'/Well No
10EGW08	1/12/85	1620	WKW/RCK	0	17.17	17.35	17	5.5	280	20	Cloudy	Total depth = 42.57'/Well No. Hand bailed with stainless steel bailer
10PW01	1/14/85	0955	WKW/JRF	0	--	--	17	7.55	780	--	Cloudy	Near DPDO Well No. 17 by b No. 12
10PW02	1/14/85	0910	WKW/JRF	0	--	--	17	7.45	560	--	Clear	Well No. 4 by Building No. 10
10PW03	1/14/85	1010	WKW/JRF	0	--	--	17	7.48	540	--	Clear	Well No. 8 by Building No. 10
10PW04					Sample Not Taken							Well No. 10 by Building No. 10
10PW05	1/14/85	0940	WKW/JRF	0	--	--	17	7.53	480	--	Clear	Well No. 13 by Building No. 10
10PW06					Sample Not Taken - Pump Out of Service							Well No. 13 by Building No. 10
10EGW13				100	20.52			Sample Not Taken				Total depth = 20.92' or 0.50' of Standing water
13GW01	1/10/85	1133	RCK/WKW	0	11.80	12.00	22	--	--	30	Gray to clear	Purge water drummed
13GW02	1/10/85	1157	RCK/WKW	80	10.25	10.47	18	--	--	55	Gray to clear	Petroleum odor - 1" of oil Purge water drummed
13GW03	1/11/85	0910	WKW/RCK	100	11.10	12.03	19	--	--	55	Gray to clear	Petroleum odor - 1" of oil Purge water drummed
13GW04	1/11/85	0930	WKW/RCK	80	15.40	16.10	19	--	--	55	Gray to clear	Petroleum odor - 1" of oil Purge water drummed
13GW05	1/11/85	1005	WKW/RCK	0	10.70	11.03	19	--	--	55	Gray to clear	Petroleum odor - 1/2" of oil Purge water drummed
13GW06	1/11/85	1025	WKW/RCK	12	8.90	9.12	19	--	--	55	Gray to clear	Petroleum odor - 1" of oil Purge water drummed

CP-00348-03.05-10/01/85

Well No.	Date Sampled	Time Sampled (hours)	Sampled By	OVA Reading (ppm)	Static Water Level (ft)*	Water Level At Sampling (ft)*	Sample Temp. (°C)	pH	Specific Cond.	Gallons Purged	Sample Color	Remarks
13GW07	1/10/85	1210	RCK/WKW	0	--	--	18	--	--	25	Gray	Purge water drummed
13GW08	1/10/85	1117	WKW/RCK	0	10.52	10.82	17	--	--	20	Gray to clear	Purge water drummed
15GW01	1/13/85	0933	RCK/WKW	0	12.20	12.35	17	7.15	360	80	Very silty	
15GW02	1/13/85	1002	RCK/WKW	0	11.20	11.32	18	6.90	260	100	Clear	
15GW03	1/13/85	1030	RCK/WKW	0	9.95	10.01	18	6.14	200	100	Cloudy	
15GW04	1/13/85	1055	RCK/WKW	0	10.00	10.00	18	6.08	100	100	Cloudy	
15GW05	1/13/85	1115	RCK/WKW	0	11.75	11.82	18	5.46	160	90	Cloudy	
15GW06	1/13/85	1142	WKW/RCK	0	11.10	11.15	18	5.20	150	90	Cloudy	
16GW01	1/11/85	1230	WKW/RCK	0	21.00	21.15	18	5.52	270	34	Tan, sediment	HCN = 0, Hand bailed
16GW02	1/11/85	1110	WKW/RCK	8	8.55	9.17	18	5.80	260	55	Gray to clear	HCN = 0, purge water dru
C-7 16GW03	1/11/85	1128	WKW/RCK	20	7.25	7.56	18	5.75	300	55	Gray to clear	HCN = 0, Purge water dru
16GW04	1/11/85	1147	WKW/RCK	20	8.55	9.00	18	6.76	440	55	Gray to clear	HCN = 0, Purge water dru
19GW01	1/9/85	1540	WKW/RCK	0	4.79	5.33	17	6.52	340	100	Cloudy	
19GW02	1/9/85	1610	RCK/WKW	0	1.44	2.07	17	7.18	360	100	Cloudy	
21GW01	1/10/85	0910	WKW/RCK	0	13.70	13.95	17	6.78	1200	100	Clear	
21GW02	1/9/85	1505	WKW/RCK	2	0.00	0.50	17	7.29	380	100	Clear	
21GW03	1/9/85	1630	WKW/RCK	1	5.05	5.15	17	6.29	280	70	Clear	
21GW04	1/10/85	1000	WKW/RCK	0	10.20	10.27	17	6.88	350	100	Clear	
21GW05	1/10/85	0935	RCK/JRF	0	4.70	4.93	17	7.01	240	100	Clear	

\*Water level measurements taken from the top of the outside protective casing. Stickups will be measured when the wells are surveyed.

CP-00348-03.05-10/01/85

Page 1 of 1

DATE \_\_\_\_\_

CLIENT CHERRY POINT MCAS FILE NO. 7095 BY WKWSUBJECT SURFACE WATER SAMPLES Checked By \_\_\_\_\_

SAMPLE NUMBER	DATE SAMPLED	TIME SAMPLED (HOURS)	SAMPLED BY	REMARKS
SITE NO 4 4 SW 01	1-8-85	1100	JRF	TEMP. 10 °C
SITE NO 5 5 SW 01	1-11-85	1630	JRF/WKW	TEMP. 7 °C
SITE NO 7 7 SW 01	1-8-85	1611	JRF	TEMP. 13 °C
SITE NO 10 10 LW 01	1-12-85	1037	JRF	TEMP. 5 °C
SITE NO 10 10 LW 02	1-12-85	1125	RCK	TEMP. 5 °C
SITE NO 10 10 SW 03	1-12-85	0920	WKW	TEMP. 5 °C
SITE NO 10 10 LW 04	1-12-85	0920	RCK	TEMP. 5 °C
SITE NO 10 10 LW 05	1-12-85	0920	JRF	TEMP. 5 °C

Page 1 of 3

DATE \_\_\_\_\_

CLIENT CHERRY POINT MCAS FILE NO. 7095 BY WKWSUBJECT SOIL SAMPLES Checked By \_\_\_\_\_

SAMPLE NUMBER	DATE SAMPLED	TIME SAMPLED (HOURS)	SAMPLED BY	REMARKS
SITE NO 10 10 S0 01	1-12-85	1037	RCK	FINE GRAIN SILTY SAND, FE STAIN, SOME ORGANIC MATERIAL
SITE NO 10 10 S0 02	1-12-85	1125	JRF	" " "
SITE NO 10 10 S0 04	1-12-85	0920	RCK	" " "
SITE NO 10 10 S0 05	1-12-85	0920	JRF	FINE GRAIN SILTY SAND, FE STAIN, SOME ORGANIC MATERIAL
SITE NO 17 17 S0 1	1-14-85	0810	RCK	FINE GRAIN SILTY SAND
SITE NO 17 17 S0 2	1-14-85	0815	RCK	FINE GRAIN SILTY SAND
SITE NO 17 17 S0 3	1-14-85	0815	<del>BE</del> JRF	FINE GRAIN SILTY SAND
SITE NO 17 17 S0 4	NOT SAMPLED - FILL DUMPED AT THIS LOCATION			
SITE NO 17 17 S0 5	NOT SAMPLED - FILL DUMPED AT THIS LOCATION			

Page 2 of 5

DATE \_\_\_\_\_

CLIENT CHERRY POINT MCAS FILE NO. 7095 BY WKWSUBJECT SOIL SAMPLES Checked By \_\_\_\_\_

SAMPLE NUMBER	DATE SAMPLED	TIME SAMPLED (HOURS)	SAMPLED BY	REMARKS
SITE NO 17 17506	NOT SAMPLED -			FILL DUMPED AT THIS LOCATION
SITE NO 18 18501A	1-13-85	1330	JRF	<u>0' TO 1'</u> - GRAY TO BLACK, FINE GRAIN SILTY SAND
SITE NO 18 18501B	1-13-85	1335	JRF	<u>1' TO 2'</u> - DARK BROWN, FINE GRAIN SILTY SAND
SITE NO 18 18501C	1-13-85	1340	JRF	<u>2' TO 3'</u> - DARK BROWN, FINE GRAIN SILTY SAND
SITE NO 18 18502A	1-13-85	1335	RCK	<u>0' TO 1'</u> - LIGHT BROWN SILTY FINE SAND
SITE NO 18 18502B	1-13-85	1340	RCK	<u>1' TO 2'</u> - BROWN SILTY SAND
SITE NO 18 18502C	1-13-85	1345	RCK	<u>2' TO 3'</u> - BROWN SILTY SAND
SITE NO 18 18503A	1-13-85	1400	JRF	<u>0' TO 1'</u> - LIGHT BROWN SILTY SAND
SITE NO 18 18503B	1-13-85	1405	JRF	<u>1' TO 2'</u> - LIGHT BROWN SILTY SAND



Page 1 of 2

DATE \_\_\_\_\_

CLIENT CHERRY POINT MCAS FILE NO. 7095 BY WKWSUBJECT SEDIMENT SAMPLES Checked By \_\_\_\_\_

SAMPLE NUMBER	DATE SAMPLED	TIME SAMPLED (HOURS)	SAMPLED BY	REMARKS
SITE NO'S 5SD01	1-11-85	1030	WKW/JRF	SOME FINE SAND MOSTLY ORGANIC MATERIAL
SITE NO'S 15SD01	1-13-85	0936	JRF	FINE GRAIN SILTY SAND, LIGHT BROWN, SOME ORGANIC MATERIAL
SITE NO'S 15SD02	1-13-85	0955	JRF	" "
SITE NO'S 15SD03	1-13-85	1000	JRF	" "
SITE NO'S 15SD04	1-13-85	1025	JRF	" "
SITE NO'S 15SD05	1-13-85	1050	JRF	" "
SITE NO'S 15SD06	1-13-85	1107	JRF	" "
SITE NO'S 15SD07	1-13-85	1125	JRF	" "
SITE NO'S 15SD08	1-13-85	1150	JRF	FINE GRAIN SILTY SAND, LIGHT BROWN, SOME ORGANIC MATERIAL



Page 2 of 2

DATE \_\_\_\_\_

CLIENT CHERRY POINT MCAS FILE NO. 7095 BY WKW

SUBJECT SEDIMENT SAMPLES Checked By \_\_\_\_\_

SAMPLE NUMBER	DATE SAMPLED	TIME SAMPLED (HOURS)	SAMPLED BY	REMARKS
SITE #17 17SD01	1-14-85	0755	JRF	MEDIUM COARSE GRAIN SAND
SITE #17 17SD02	1-14-85	0755	RCK	FINE GRAIN SILTY SAND
SITE #17 17SD03	1-14-85	0800	JRF	FINE GRAIN SILTY SAND
SITE #17 17SD04	1-14-85	0800	RCK	MEDIUM COARSE GRAIN SAND
SITE #17 17SD05	1-14-85	0810	RCK	MEDIUM COARSE GRAIN SAND
SITE #17 17SD06	1-14-85	0825	JRF	FINE GRAIN SILTY SAND

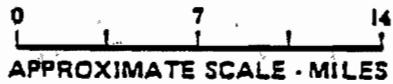
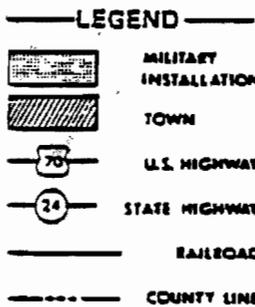
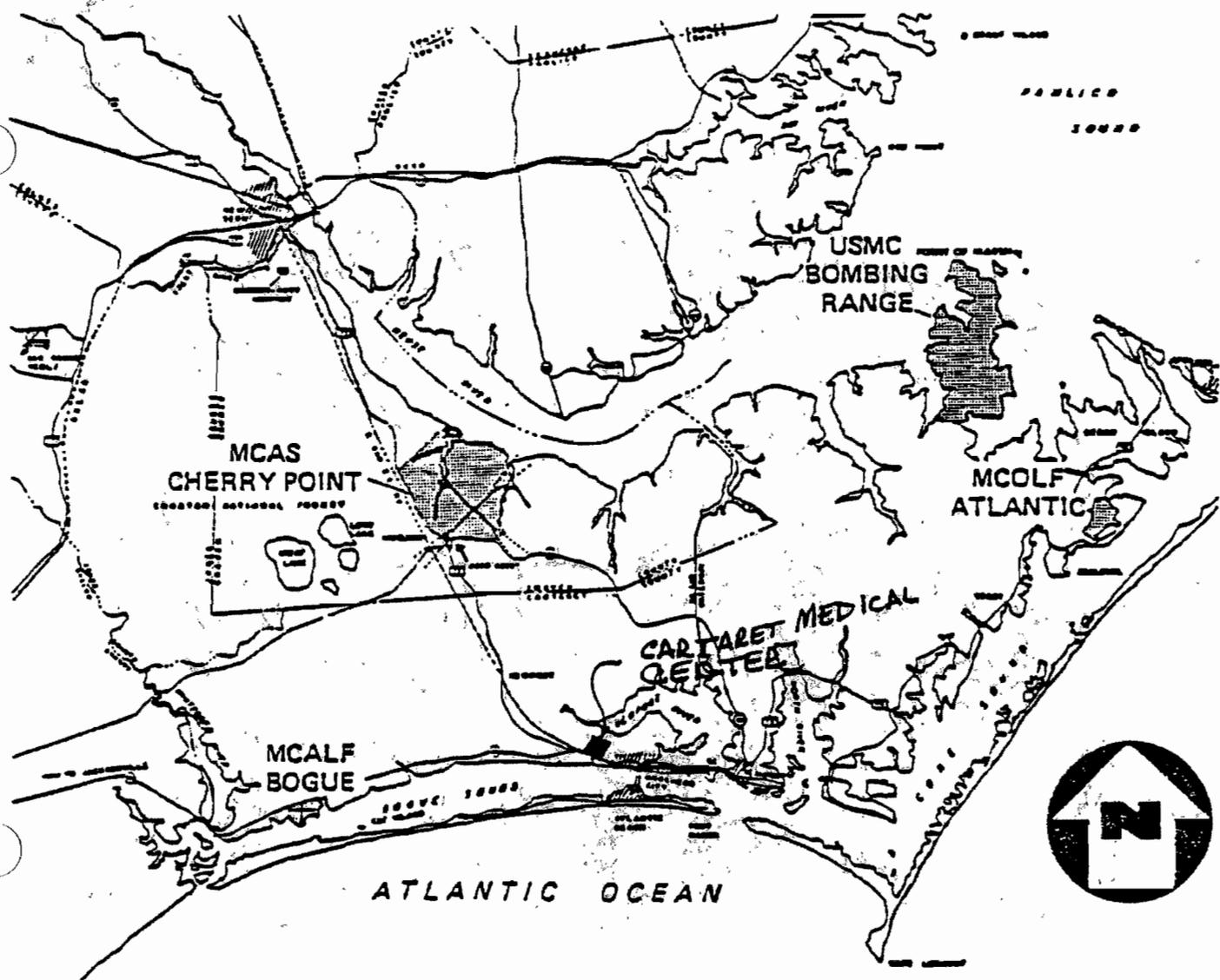
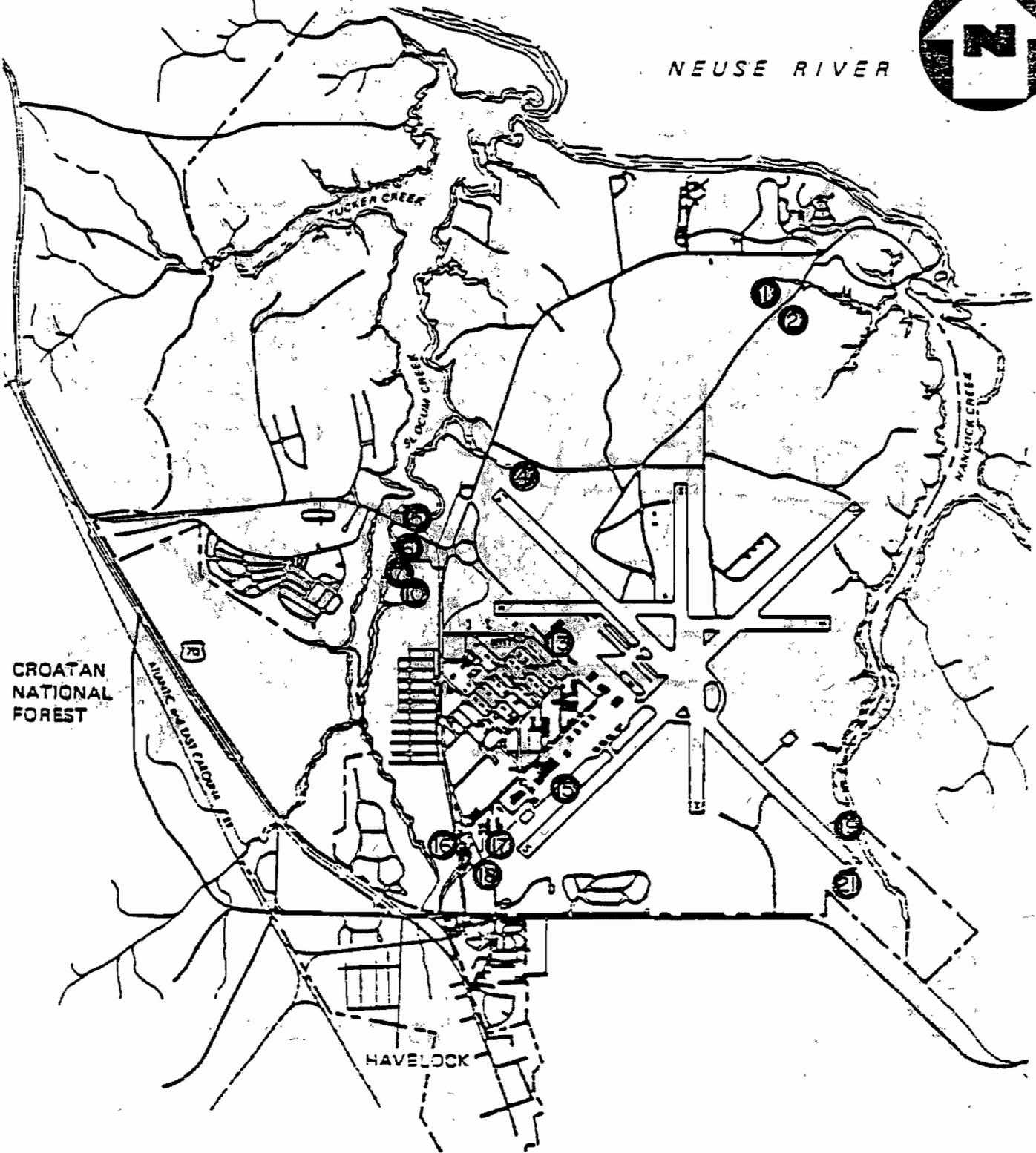


FIGURE 1-1

VICINITY MAP  
MCAS CHERRY POINT, NC



NEUSE RIVER



CROATAN NATIONAL FOREST

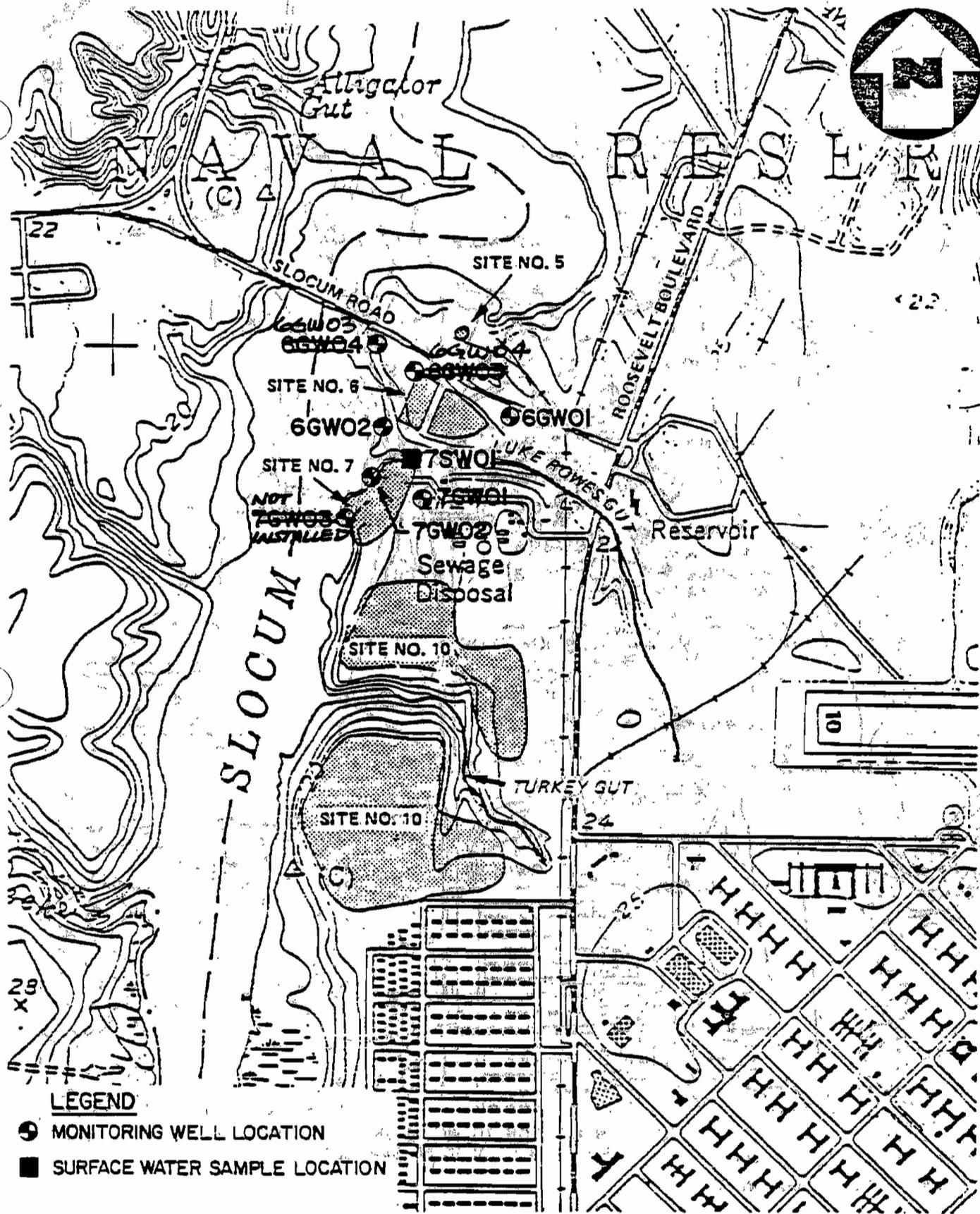
HAVELOCK

FIGURE 2-1

SITE LOCATION MAP  
MCAS CHERRY POINT, NC  
SCALE 1" = 4500'

C-15





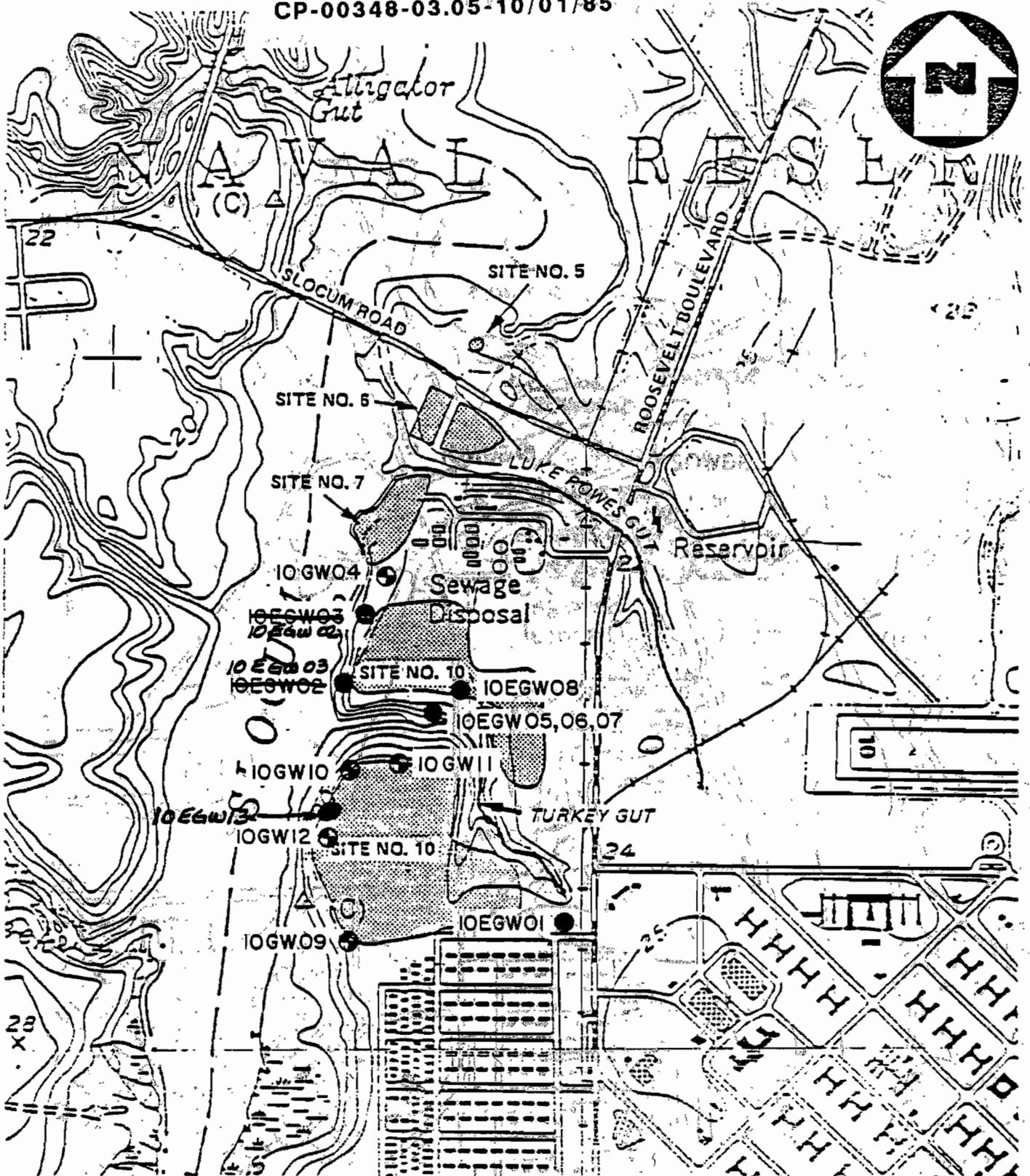
**PROPOSED MONITORING WELLS AND SURFACE WATER  
SAMPLE LOCATIONS, SITE NOS. 6 & 7  
MCAS CHERRY POINT, NC**

FIGURE 2-5

SCALE 1" = 1000'



A Halliburton Company



**LEGEND**

- EXISTING MONITORING WELL
- ⊙ PROPOSED MONITORING WELL

NOTE: IN ADDITION TO WELLS SHOWN, SIX EXISTING DEEP POTABLE WELLS WILL ALSO BE SAMPLED.

**EXISTING & PROPOSED MONITORING WELL  
LOCATIONS, SITE NO. 10  
MCAS CHERRY POINT, NC**

SCALE 1" = 1000'

FIGURE 2-7



A Halliburton Company



SITE SAFETY FOLLOW UP REPORT

Actual Date of Work: JANUARY 7 THROUGH 14, 1985

Actual Site Investigation Team:

NUS Personnel:

Bill WELLS  
CARL KETCHUM  
Jim FERGUSON  
LARRY REITZ

Responsibility:

TEAM LEADER  
SAMPLER  
SAMPLER  
SITE GEOLOGIST

Other:

Purpose:

PERSONAL PROTECTIVE EQUIPMENT

a. Level of Respiratory Protection Used

"C" AND "D"

Activity Performed

GROUNDEATER,  
SOIL AND SURFACE  
WATER SAMPLING

b. Field Dress

Activity

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

MONITORING EQUIPMENT

a. SOVA

o Background reading

SEE MONITORING

o Readings above background

WELL DATA

o Location of high readings

SHEET

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

b. Radiation

o Readings above background?  Yes  No

o If yes, specify where readings were found and what action was taken.

SEE  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

GENERAL SAFETY

a. Were any safety problems encountered while on site? NO

Explain: NONE  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Accident Report Information

- a. Did any team member report:
- |   | <u>Yes</u> | <u>No</u> |
|---|------------|-----------|
| <input type="radio"/> Chemical exposure                         | _____      | _____ /   |
| <input type="radio"/> Illness, discomfort, or unusual symptoms  | _____      | _____ /   |
| <input type="radio"/> Environmental Problems (heat, cold, etc.) | _____      | _____ /   |

b. Explain:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- c. Was an Employee Exposure/Injury Incident Report completed? \_\_\_ Yes \_\_\_  No

Safety Plan Evaluation

- a. Was the Safety Plan Adequate? \_\_\_  Yes \_\_\_ No

b. What changes would you recommend?

**NONE**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Prepared by: MARK GRADKOWSKI

Reviewed by: \_\_\_\_\_

Team Leader: William Kull

Approved by: \_\_\_\_\_



