

N61165.AR.005269
CNC CHARLESTON
5090.3a

LETTER REGARDING SOUTH CAROLINA DEPARTMENT OF HEALTH AND
ENVIRONMENTAL CONTROL APPROVAL OF RCRA MONITORING WELL INSTALLATION
VARIOUS SITES CNC CHARLESTON SC
08/01/1996
SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

Monitoring Well Installation Approval

Approval is hereby granted to: Commander Paul Rose for

SWMUs 25, 65, 70 AOCs 539, 549, 570
Charleston Naval Shipyard/Base
Charleston County
RCRA Permit # SC0-170-022-560

for the construction of thirteen monitoring wells designated in accordance with the construction plans and specifications submitted to the Department on 22 August 1996 (Temple to Bergstrand).

The wells will be constructed within the surficial aquifer to the approximate depth of 40 feet below the surface and screened for the purpose of monitoring aquifer conditions.

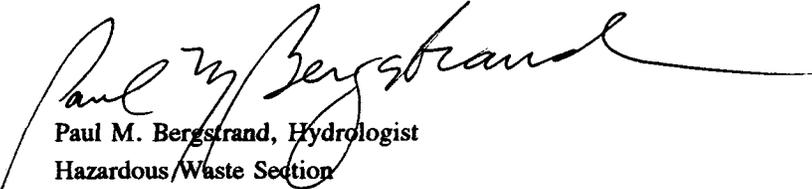
Conditions:

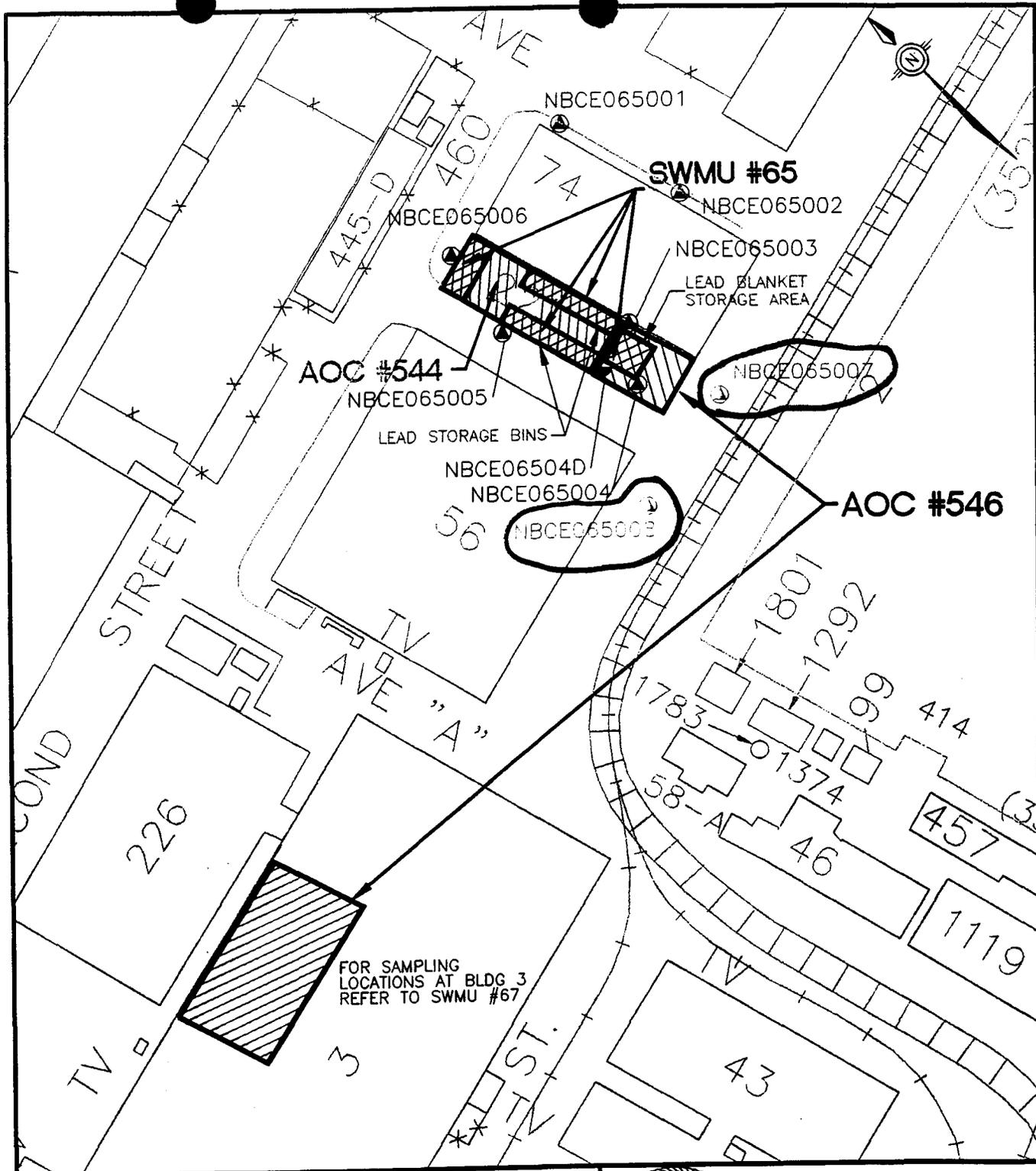
1. A driller certified to operate in the State of South Carolina must install the monitoring wells.
2. The drillers certification number, the latitude and longitude and the actual construction details for each well be submitted with the report of laboratory findings.
3. All monitoring wells must be developed until temperature, specific conductivity and turbidity measurements stabilize and the well produces clear, sediment-free water. Submit a record of these measurements with the well construction details.
4. All drill cuttings from the boreholes and purge water from well development must be contained. The containerized materials must be analyzed for disposal utilizing the same methods as the samples.
5. Contact Christine Sanford-Coker, Trident District EOC Hydrogeologist, during normal business hours at (803) 740-1590 at least 48 hours before installation of the wells.

This approval is pursuant to the provisions of Section 44-55-40 of the 1976 South Carolina Code of Laws and the Department of Health and Environmental Control Well Standards and Regulations, R.61-71. This approval is valid up to sixty days after the date of issue.

Date of Issue: 26 August 1996

Approval Number: HW-96-0073


Paul M. Bergstrand, Hydrologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Solid and Hazardous Waste



LEGEND

- - PROPOSED DEEP MONITORING WELLS
- - PROPOSED SHALLOW MONITORING WELLS
- - EXISTING DEEP MONITORING WELLS
- - EXISTING SHALLOW MONITORING WELLS

GRAPHIC SCALE 100 0 100 200



FINAL RFI
 ZONE E WORKPLAN
 NAVAL BASE CHARLESTON
 CHARLESTON, S.C.

PROPOSED SECOND ROUND
 WELL LOCATIONS
 SWMU #65, LEAD STORAGE AREA
 AOC #544, PICKLING PLANT
 AOC #546, GALVANIZING SHOP

DWG DATE: 8/20/96 DWG NAME: FIGURE06



GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

RECEIVED

JUN 3 1996

May 30, 1996

HYDROGEOLOGY

Mr. Paul Bergstrand, Hydrogeologist
Bureau of Solid and Hazardous Waste Management
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

CPW = OWNER
HW - 96-0044
Temp. 0044-CPW.606

Re: Permanent Groundwater Monitoring Well Installation Permit Request
Proposed Commissioners of Public Works Lease Areas
Naval Base Charleston
North Charleston, South Carolina

Dear Mr. Bergstrand:

General Engineering Laboratories, Inc. (GEL) requests approval for the installation of 17 permanent groundwater monitoring wells, MW-1 through MW-17, at the locations shown on the attached figures. These wells will be installed in accordance with the South Carolina Well Standards and Regulations, 61-71. The proposed wells will provide groundwater quality data to determine the presence or absence of constituents of potential concern in groundwater at the referenced site.

Data from well MW-3, will be used for a "Change-of-Ownership" assessment of an on-site underground storage tank system which will be transferred from the Naval Base to the Commissioners of Public Works of the City of Charleston, South Carolina (CPW). The well installation procedures are included in the attachment. We plan to begin installation of the wells during the week of June 3, 1996.

Thank you for your assistance with this project. If you have any questions concerning the well installation procedures or if you need additional information, please call me at (803) 769-7378, extension 4418.

Sincerely,

Tracy D. Jones
Tracy D. Jones
Hydrogeologist II

enclosure
fc: cpwc00196.052896.well.permit



ATTACHMENT

PROPOSED PERMANENT GROUNDWATER MONITORING WELL INSTALLATION PROCEDURES

Proposed Commissioners of Public Works Lease Areas
Naval Base Charleston
North Charleston, South Carolina

Permanent groundwater monitoring wells MW-1 through MW-17 will be installed into the uppermost aquifer by a South Carolina Certified Well Driller at the locations shown on Figures 1 and 2. These wells will be installed with a drill rig equipped with 4 1/4-inch inside diameter hollow stem augers to depths approximately 8 to 10 feet below the water table, which is anticipated to be approximately 5 feet below land surface (bls). Therefore, the wells will be approximately 15 feet in total depth. Equipment used in the installation process will be steam-cleaned prior to use at the site and in between each well installation. In addition, a photo-ionization detector (PID) or flame ionization detector (FID) will be used during the well installation activities to monitor environmental conditions at the site.

To construct the wells, 2-inch diameter, flush threaded, PVC well casing and a 10-foot, No. 10 slot screen will be placed in the borehole. After placement of the PVC casing and screen in the borehole, a medium-grained sand will be used for the sand pack and will extend approximately 18 inches above the top of the screen. A hydrated bentonite plug, at least 2-feet thick, will then be emplaced above the sand pack to seal the borehole. The remaining borehole will be filled to land surface with a neat cement grout. To complete the well, a locking cap will be placed on the top of the PVC well casing. A flush-mounted protective steel cover will be set in the cement grout to protect the well casing. At the option of CPW, an above-grade protective well cover may be used to protect the well casing. A generalized well schematic is included as Figure 3. The monitoring wells will be developed after installation by pumping and surging and/or bailing until relatively sediment free water is produced.

Sample collection procedures and field measurements will be conducted in accordance with accepted United States Environmental Protection Agency and South Carolina Department of Health and Environmental Control (DHEC) protocols. The monitoring wells will be sampled no sooner than two days following well installation. After measuring the depth to groundwater, each well will be evacuated to remove stagnant water. If the well has a sufficient yield, it will be evacuated by removing a minimum of three casing volumes and until pH and specific conductivity measurements have stabilized. If the well is evacuated to dryness prior to removing three casing volumes, it will be sampled as soon as an adequate volume of water has recharged the well casing.

After evacuation of the monitoring wells is complete, a set of laboratory-cleaned, pre-preserved, pre-labeled bottles will be removed from a cooler. Each well will be sampled using a pre-cleaned Teflon™ bailer. Fresh sample will be poured into each container directly from the bailer. Laboratory quality PVC gloves will be worn by sampling personnel throughout the sampling process. Full sample containers will be placed on ice in a pre-cleaned cooler. A Chain of Custody Record will be maintained



**ATTACHMENT
(Continued)**

**PROPOSED PERMANENT GROUNDWATER
MONITORING WELL INSTALLATION PROCEDURES**

**Proposed Commissioners of Public Works Lease Areas
Naval Base Charleston
North Charleston, South Carolina**

during the sampling activities. The samples will be submitted to General Engineering Laboratories, Inc. for analysis. ✓

Table 1 below summarizes the investigation area, well numbers, potential sources of environmental impact, and the proposed laboratory analyses for each groundwater sample. ✓

**Table 1
Summary of Subsurface Investigation Activities**

Investigation Area	Well Number	Potential Source of Impact	Laboratory Analysis
Building 1175	MW-1, MW-2	Off-site ASTs	TPH, TCL-V, TCL-BN, P/H
Service Station	MW-3	3-USTs	BTEX, Nap, PAH, MTBE
Building 240	MW-4, MW-5	Oil/Water Separator	TPH, TCL-V, TCL-BN, RCRA Metals, P/H
Building 242	MW-6, MW-7	Oil/Water Separator and Wash Racks	TPH, TCL-V
Building 1172	MW-8, MW-9	Oil Spill	TPH, TCL-V, TCL-BN, P/H
11th Street	MW-10, MW-11	Off-site industrial activities and galvanizing operations, including above ground storage tanks	TPH, TCL-V, TCL-BN, RCRA Metals, P/H
Former building between 242 and 255	MW-12, MW-13, MW-14	Former train repair and maintenance activities	TPH, TCL-V, TCL-BN, RCRA Metals, P/H
Building 1838	MW-15, MW-16, MW-17	Material storage	TCL-V, TCL-B/N, TCL-AC, TCL-P/P, RCRA metals

Notes:

TCL-V = Target Compound List-Volatile Organic Compounds (EPA Method 8260)

TCL-BN = Target Compound List Base/Neutral Extractable Compounds (EPA Method 8270)

TCL-P/P = Target Compound List - Pesticides/PCB Compounds (EPA Method 8280)

TPH = Total Petroleum Hydrocarbons (EPA Method 9071)

BTEX = Benzene, toluene, ethyl benzene, total xylenes (EPA Method 8020)

Nap = Naphthalene (EPA Method 8020)

MTBE = Methyl tert-butyl ether (EPA Method 8020)

RCRA metals = Arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver (EPA Method 6010A)

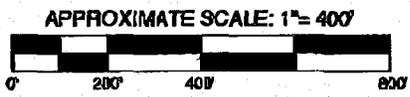
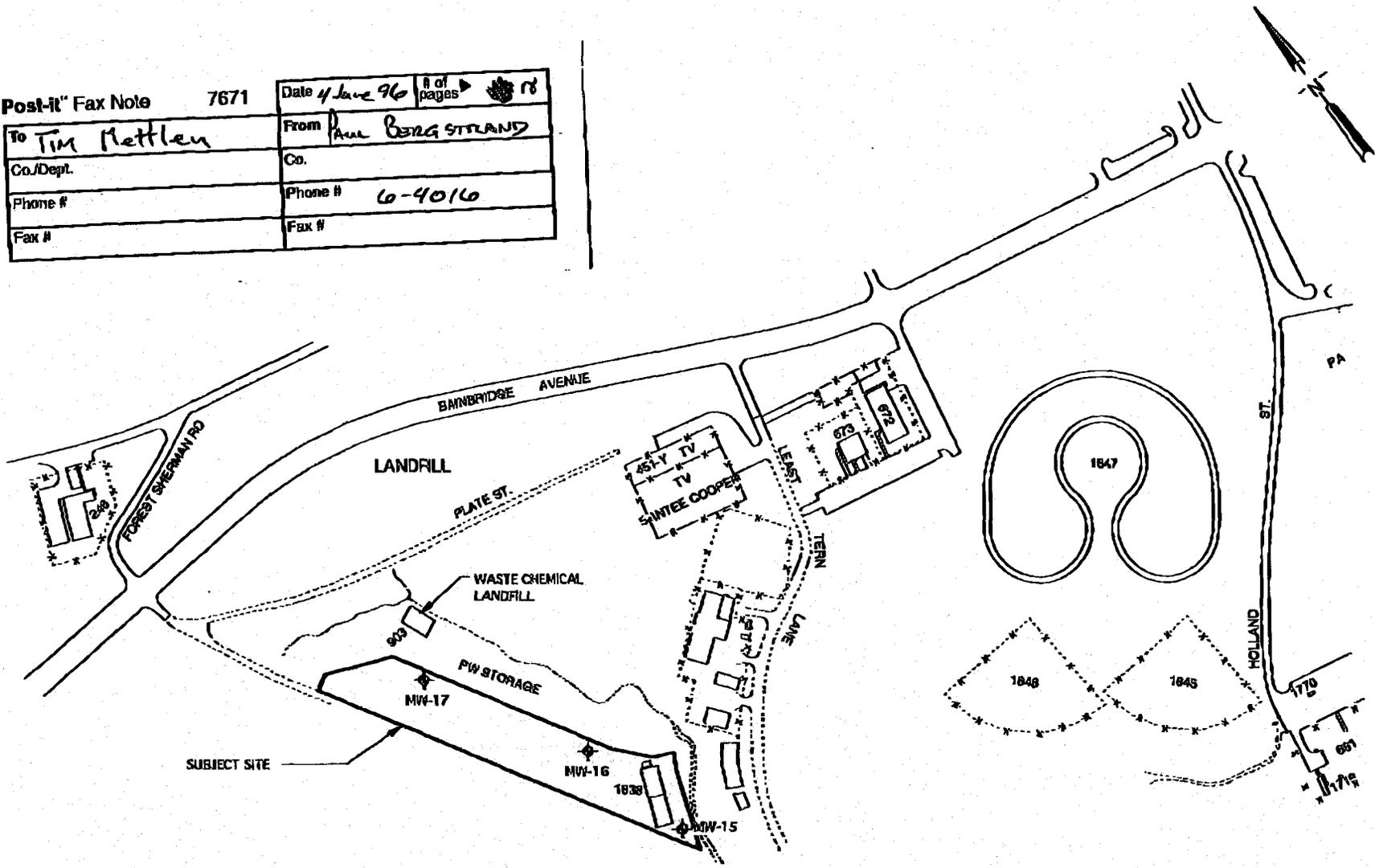
P/H = Pesticides and Herbicides (EPA Method 8080 and 8150)

PCB = Poly-chlorinated biphenyls

GENERAL ENGINEERING LABORATORIES
PO Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29414
(803) 556-8171 • Fax (803) 766-1178

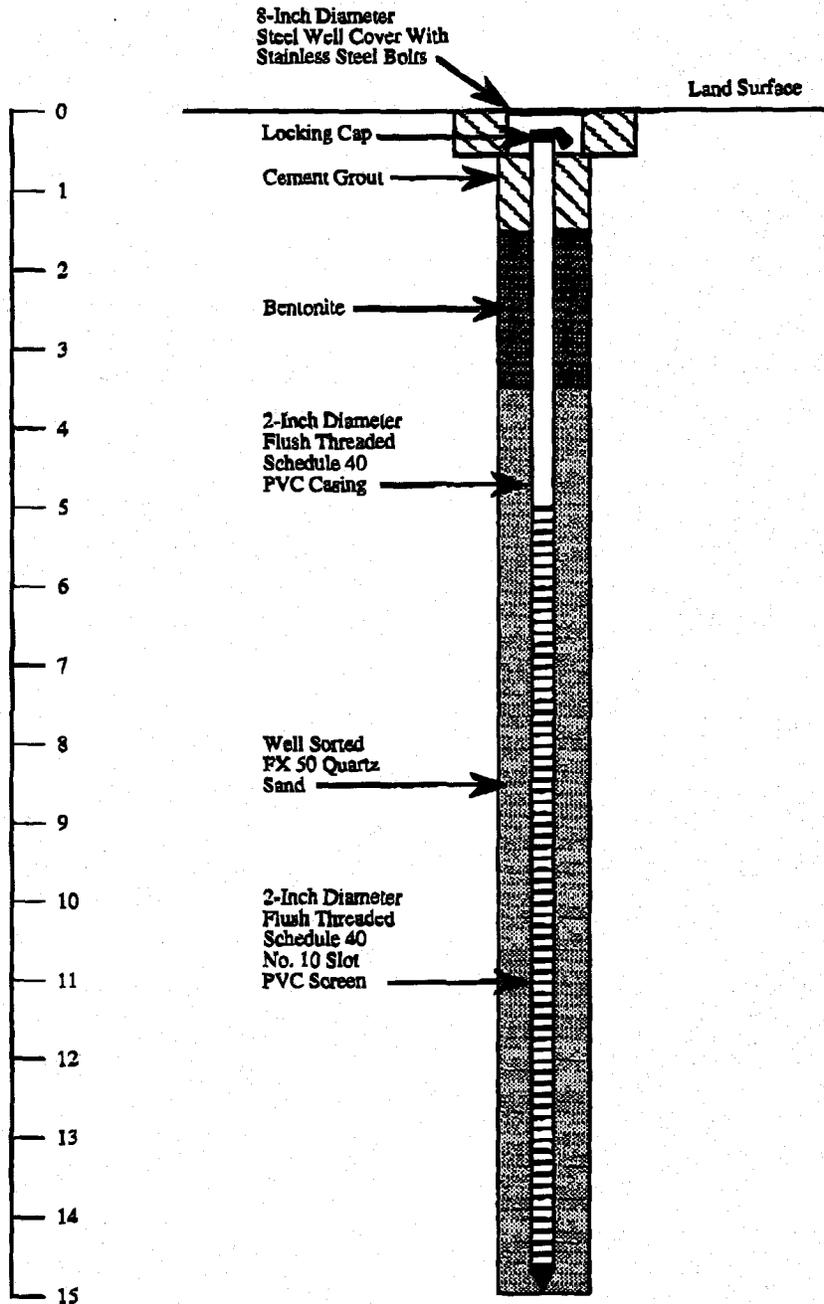


Post-It [®] Fax Note 7671		Date 4 June 96	# of pages 18
To Tim Mettlen	From PAUL BERGSTRAND		
Co./Dept.	Co.		
Phone #	Phone # 6-4016		
Fax #	Fax #		



LEGEND
 ◆ PROPOSED MONITORING WELL LOCATION
 MW-17

GENERAL ENGINEERING LABORATORIES, INC. <small>environmental consulting and analytical services</small> 	PROJECT: epw-90188 EVALUATION OF BASELINE ENVIRONMENTAL CONDITIONS 3.62 ACRE TRACT NAVAL BASE CHARLESTON CHARLESTON, SOUTH CAROLINA	SITE MAP WITH SURROUNDING PROPERTIES	FIGURE 2
	P.O. BOX 90712 CHARLESTON, SC 29417 (803) 698-8171		



**GENERAL ENGINEERING
LABORATORIES, INC.**



environmental consulting and analytical services

P.O. BOX 5172
CHARLESTON, SC 29417
(803) 556-8171

PROJECT: epw0019d

EVALUATION OF BASELINE
ENVIRONMENTAL CONDITIONS
PROPOSED CPW LEASE AREAS
NAVAL BASE, CHARLESTON
CHARLESTON, SOUTH CAROLINA

PERMANENT GROUNDWATER
MONITORING WELL SCHEMATIC

FIGURE
3

DATE: May 20, 1996

DRAWN BY: KBC APPRV. BY: TBJ

RECEIVED

JUN 19 1996

Groundwater Protection
Division

DRIVER: PLEASE SIGN HERE

Printed on recycled paper

SANDY PINES LANDFILL
P.O. BOX 69
374 SANDY PINES LANE
DORCHESTER, SC 29437-0000

Page: 01 of 01

TICKET NBR

0020511

ORIGINAL

HAULER NAME	TRUCK #	OPERATOR	TIME IN	TIME OUT	DATE
US NAVAL WEAPONS STATION	42523	SW	8:41AM	9:09AM	2/24/94

US NAVAL WEAPONS STATION
0062789
P.O. BOX 71489
N CHAS, SC 29915-1489

GROSS POUNDS : 46,540.00IN-1
TARE POUNDS : 19,800.00OUT-
NET POUNDS : 26,740.00

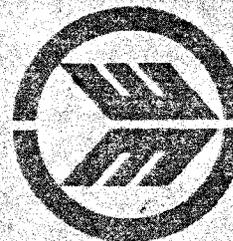
SANDY PINES OPERATING HOURS

6 AM TO 4 PM MON - FRI

ADJUSTED POUNDS: 26,740.00

SOURCES	OTHER INFORMATION
---------	-------------------

US NAVAL WEAPONS STATION



248736 US NAVAL WEAP 3/94
D42 CELL 2

MATERIAL CODE/DESCRIPTION	QUANTITY	MEASURE	RATE	AMOUNT
658 -658 CONTAMINATED MATERIAL	13.37	TONS		

Encl (4)

Commissioner: Douglas E. Bryant

Board: John H. Burriss, Chairman
William M. Hull, Jr., MD, Vice Chairman
Roger Leaks, Jr., Secretary

Promoting Health, Protecting the Environment

RECEIVED
AUG 9 1995
Richard E. Jabbour, DDS
Cynthia C. Mosteller
Brian W. Smith
Rodney L. Grady

Groundwater Protection
Division

MEMORANDUM

TO: David Walton, Engineer
Hazardous Waste Permitting Section
Division of Hazardous and Infectious Waste Management
Bureau of Solid and Hazardous Waste Management

FROM: Joe B. Bowers, Hydrogeologist *SB*
Hazardous Waste Section
Division of Hydrogeology
Bureau of Solid and Hazardous Waste Management

DATE: August 4, 1995

RE: Charleston Naval Base and Shipyard (NAVBASE)
SC0 170 022 560
Charleston County

Monitoring Well Approval for Zone E (Mayfield to Bowers, 6/23/95) and
Grid wells NBCH-GDH-012 and NBCC-GDC-003 (Kafka to Bowers, 7/25/95)

The above requests for monitoring well approval have been reviewed with respect to the requirements of R.61-79.264.101(d) of the South Carolina Hazardous Waste Management Regulations, the U.S. Region IV Standard Operating Procedures and Quality Assurance Manual, the South Carolina Well Standards and Regulations, R.61-71, and appropriate guidance documents.

The first correspondence requests approval to install a total of 172 monitoring wells in Zone E. These wells are being installed in accordance with procedures included in the approved Comprehensive RFI Workplan, dated August 30, 1994, and at the locations depicted in the approved Zone E RFI Workplan.

Monitoring Well Installation Approval

Date of Issue: August 4, 1995 **Approval No.:** HW-95-0035

Approval is hereby granted to: Mr. Ralph L. Laney
on behalf of: Charleston Naval Shipyard

Permit or SCD #: SC0 170 022 560
County: Charleston

This approval is for the installation of 172 monitoring wells in Zone E in accordance with the Zone E RFI Workplan and the approved Comprehensive RFI Workplan, Volume II - Sampling and Analysis Plan, dated August 30, 1994. The wells are to be constructed within the surficial aquifer for the intended purpose of monitoring groundwater quality and water levels.

Approval is provided with the following conditions:

1. Monitoring wells shall be installed by a well driller certified by the State of South Carolina.
2. That the latitude, longitude, "as built" construction details, boring and/or geologist logs be submitted to the Hazardous Waste Section of the Bureau of Solid and Hazardous Waste Management within 30 days of installation of the last well.
3. The monitoring wells must be developed by pump and surge and/or surge block techniques. Development must continue until temperature, specific conductivity, and turbidity measurements stabilize and the wells produce clear, relatively sediment-free water. A log of these measurements must be maintained during development. This log

Monitoring Well Installation Approval

Date of Issue: August 4, 1995 **Approval No.:** HW-95-0038

Approval is hereby granted to: Mr. Ralph L. Laney
on behalf of: Charleston Naval Shipyard

Permit or SCD #: SC0 170 022 560
County: Charleston

This approval is for the installation of two (2) monitoring wells. One well, NBCH-GDH-012, will be installed in Zone H. The second well, NBCC-GDC-003, will be installed in Zone C. These wells will be installed in accordance with the procedures included in the Comprehensive RFI Workplan, Volume II - Sampling and Analysis Plan, dated August 30, 1994, the South Carolina Well Standards and Regulations, R.61-71, and the South Carolina Hazardous Waste Management Regulations, R.61-79.264 Subpart F. The wells are to be constructed within the surficial aquifer for the intended purpose of monitoring groundwater quality and/or water levels.

Approval is provided with the following conditions:

1. Monitoring wells shall be installed by a well driller certified by the State of South Carolina.
2. That the latitude, longitude, "as built" construction details, boring and/or geologist logs be submitted to the Hazardous Waste Section of the Bureau of Solid and Hazardous Waste Management within 30 days of installation of the last well.

ZONE E
Proposed Groundwater
Monitoring Well Inventory
6/19/95

Well Identification Number	Development Date	Depth BGS Ft.	Sample Date	Sample Parameters	Number of Proposed Wells	Number of Installed Wells
NBCE-605-001				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCB + ORGANOTINS	1	0
NBCE-605-002				"	1	0
NBCE-605-003				"	1	0
NBCE-018-001				"	1	0
NBCE-005-001				"	1	0
NBCE-021-001				VOA, SVOA w/TICs, MTLs, + ORGANOTINS	1	0
NBCE-054-001				"	1	0
NBCE-054-002				"	1	0
NBCE-025-001				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCB, pH + ORGANOTINS	1	0
NBCE-542-001				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCB, pH + ORGANOTINS	1	0
NBCE-542-002				"	1	0
NBCE-543-001				"	1	0
NBCE-540-001				"	1	0
NBCE-540-002				"	1	0
NBCE-063-001				"	1	0
NBCE-023-001				"	1	0
NBCE-023-01D				"	1	0
NBCE-023-002				"	1	0
NBCE-526-001				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCB + ORGANOTINS	1	0
NBCE-526-002				"	1	0
NBCE-526-02D				"	1	0
NBCE-053-001				"	1	0
NBCE-065-001				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCB + ORGANOTINS	1	0
NBCE-065-01D				"	1	0

ZONE E
Proposed Groundwater
Monitoring Well Inventory
6/19/95

Well Identification Number	Development Date	Depth BGS Ft.	Sample Date	Sample Parameters	Number of Proposed Wells	Number of Installed Wells
NBCE-065-002				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCB + ORGANOTINS	1	0
NBCE-065-003				"	1	0
NBCE-065-004				"	1	0
NBCE-067-001				MERCURY	1	0
NBCE-067-002				"	1	0
NBCE-067-003				"	1	0
NBCE-070-001				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCB, pH + ORGANOTINS	1	0
NBCE-070-002				"	1	0
NBCE-549-001				"	1	0
NBCE-549-002				"	1	0
NBCE-549-02D				"	1	0
NBCE-549-003				"	1	0
NBCE-084-001				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCB + ORGANOTINS	1	0
NBCE-084-002				"	1	0
NBCE-083-001				"	1	0
NBCE-083-002				"	1	0
NBCE-083-02D				"	1	0
NBCE-083-003				"	1	0
NBCE-083-004				"	1	0
NBCE-083-005				"	1	0
NBCE-172-001				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCB + ORGANOTINS	1	0
NBCE-172-01D				"	1	0
NBCE-172-002				"	1	0
NBCE-097-001				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCB + ORGANOTINS	1	0

ZONE E
Proposed Groundwater
Monitoring Well Inventory
6/19/95

Well Identification Number	Development Date	Depth BGS Ft.	Sample Date	Sample Parameters	Number of Proposed Wells	Number of Installed Wells
NBCE-100-001				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCB + ORGANOTINS	1	0
NBCE-102-001				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCB + ORGANOTINS	1	0
NBCE-102-002				"	1	0
NBCE-102-003				"	1	0
NBCE-106-001				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCB + ORGANOTINS	1	0
NBCE-603-01D				"	1	0
NBCE-145-001				MERCURY	1	0
NBCE-145-002				"	1	0
NBCE-145-02D				"	1	0
NBCE-145-003				"	1	0
NBCE-525-001				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCB + ORGANOTINS	1	0
NBCE-528-001				VOA, SVOA w/TICs, pH.	1	0
NBCE-530-001				VOA, SVOA w/TICs, MTLs.	1	0
NBCE-530-01D				"	1	0
NBCE-530-002				"	1	0
NBCE-530-02D				"	1	0
NBCE-539-001				VOA, SVOA w/TICs, MTLs.	1	0
NBCE-539-01D				"	1	0
NBCE-538-001				"	1	0
NBCE-538-01D				"	1	0
NBCE-538-002				"	1	0
NBCE-550-001				VOA, SVOA w/TICs, MTLs.	1	0
NBCE-550-002				"	1	0
NBCE-551-001				VOA, SVOA w/TICs, MTLs, pH.	1	0
NBCE-551-002				"	1	0

ZONE E
Proposed Groundwater
Monitoring Well Inventory
6/19/95

Well Identification Number	Development Date	Depth BGS Ft.	Sample Date	Sample Parameters	Number of Proposed Wells	Number of Installed Wells
NBCE-551-02D				VOA, SVOA w/TICs, MTLs, pH.	1	0
NBCE-561-001				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCB.	1	0
NBCE-559-001				"	1	0
NBCE-559-01D				"	1	0
NBCE-559-002				"	1	0
NBCE-559-003				"	1	0
NBCE-559-03D				"	1	0
NBCE-560-001				"	1	0
NBCE-560-01D				"	1	0
NBCE-563-001				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCB.	1	0
NBCE-563-002				"	1	0
NBCE-563-003				"	1	0
NBCE-563-03D				"	1	0
NBCE-566-001				VOA, SVOA w/TICs, MTLs.	1	0
NBCE-566-01D				"	1	0
NBCE-570-001				VOA, SVOA w/TICs, MTLs, pH.	1	0
NBCE-570-01D				"	1	0
NBCE-570-002				"	1	0
NBCE-569-001				"	1	0
NBCE-569-002				"	1	0
NBCE-569-02D				"	1	0
NBCE-578-001				"	1	0
NBCE-578-01D				"	1	0
NBCE-572-001				VOA, SVOA w/TICs, MTLs.	1	0
NBCE-572-002				"	1	0
NBCE-572-003				"	1	0
NBCE-573-001				VOA, SVOA w/TICs, MTLs, pH.	1	0

ZONE E
Proposed Groundwater
Monitoring Well Inventory
6/19/95

Well Identification Number	Development Date	Depth BGS Ft.	Sample Date	Sample Parameters	Number of Proposed Wells	Number of Installed Wells
NBCE-573-01D				VOA, SVOA w/TICs, MTLs, pH.	1	0
NBCE-576-001				VOA, SVOA w/TICs, MTLs.	1	0
NBCE-576-002				"	1	0
NBCE-576-02D				"	1	0
NBCE-580-001				VOA, SVOA w/TICs, MTLs.	1	0
NBCE-580-002				"	1	0
NBCE-580-02D				"	1	0
NBCE-583-001				VOA, SVOA w/TICs, MTLs.	1	0
NBCE-583-002				"	1	0
NBCE-583-02D				"	1	0
NBCE-583-003				"	1	0
NBCE-586-001				VOA, SVOA w/TICs, MTLs, PCBs, pH.	1	0
NBCE-590-001				VOA, SVOA w/TICs, MTLs.	1	0
NBCE-590-01D				"	1	0
NBCE-596-001				VOA, SVOA w/TICs, MTLs.	1	0
NBCE-596-01D				"	1	0
NBCE-596-002				"	1	0
NBCE-596-003				"	1	0
NBCE-596-03D				"	1	0
NBCE-596-004				"	1	0
NBCE-598-001				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCBs.	1	0
NBCE-599-001				"	1	0
NBCE-GDE-001				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCBs.	1	0
NBCE-GDE-01D				"	1	0
NBCE-GDE-002				"	1	0
NBCE-GDE-02D				"	1	0
NBCE-GDE-003				"	1	0

ZONE E
Proposed Groundwater
Monitoring Well Inventory
6/19/95

Well Identification Number	Development Date	Depth BGS Ft.	Sample Date	Sample Parameters	Number of Proposed Wells	Number of Installed Wells
NBCE-GDE-03D				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCBs."	1	0
NBCE-GDE-004				"	1	0
NBCE-GDE-04D				"	1	0
NBCE-GDE-005				"	1	0
NBCE-GDE-05D				"	1	0
NBCE-GDE-006				"	1	0
NBCE-GDE-06D				"	1	0
NBCE-GDE-007				"	1	0
NBCE-GDE-07D				"	1	0
NBCE-GDE-008				"	1	0
NBCE-GDE-08D				"	1	0
NBCE-GDE-009				"	1	0
NBCE-GDE-09D				"	1	0
NBCE-GDE-010				"	1	0
NBCE-GDE-10D				"	1	0
NBCE-GDE-011				"	1	0
NBCE-GDE-11D				"	1	0
NBCE-GDE-012				"	1	0
NBCE-GDE-12D				"	1	0
NBCE-GDE-013				"	1	0
NBCE-GDE-13D				"	1	0
NBCE-GDE-014				"	1	0
NBCE-GDE-14D				"	1	0
NBCE-GDE-015				"	1	0
NBCE-GDE-15D				"	1	0
NBCE-GDE-016				"	1	0
NBCE-GDE-16D				"	1	0
NBCE-GDE-017				"	1	0
NBCE-GDE-17D				"	1	0

ZONE E
Proposed Groundwater
Monitoring Well Inventory
6/19/95

Well Identification Number	Development Date	Depth BGS Ft.	Sample Date	Sample Parameters	Number of Proposed Wells	Number of Installed Wells
NBCE-GDE-018				VOA, SVOA w/TICs, MTLs, CYANIDE, PEST, PCBs.	1	0
NBCE-GDE-18D				"	1	0
NBCE-GDE-019				"	1	0
NBCE-GDE-19D				"	1	0
NBCE-GDE-020				"	1	0
NBCE-GDE-20D				"	1	0
NBCE-GED-021				"	1	0
NBCE-GDE-21D				"	1	0
NBCE-GDE-022				"	1	0
NBCE-GDE-22D				"	1	0
NBCE-GDE-023				"	1	0
NBCE-GDE-23D				"	1	0
NBCE-GDE-024				"	1	0
NBCE-GDE-24D				"	1	0
NBCE-GDE-025				"	1	0
NBCE-GDE-25D				"	1	0
Totals					172 ✓	0

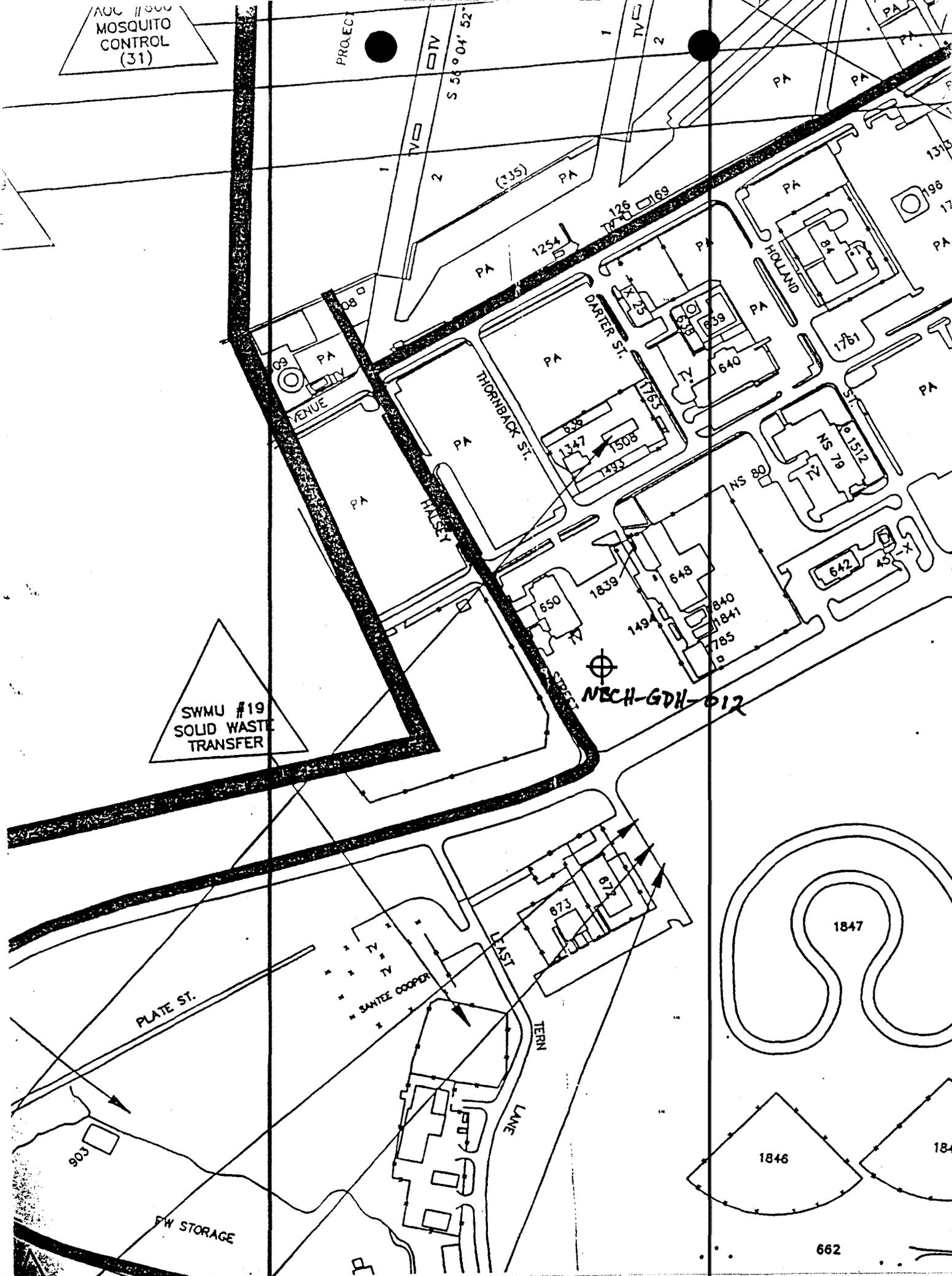
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NECH-GDH-012

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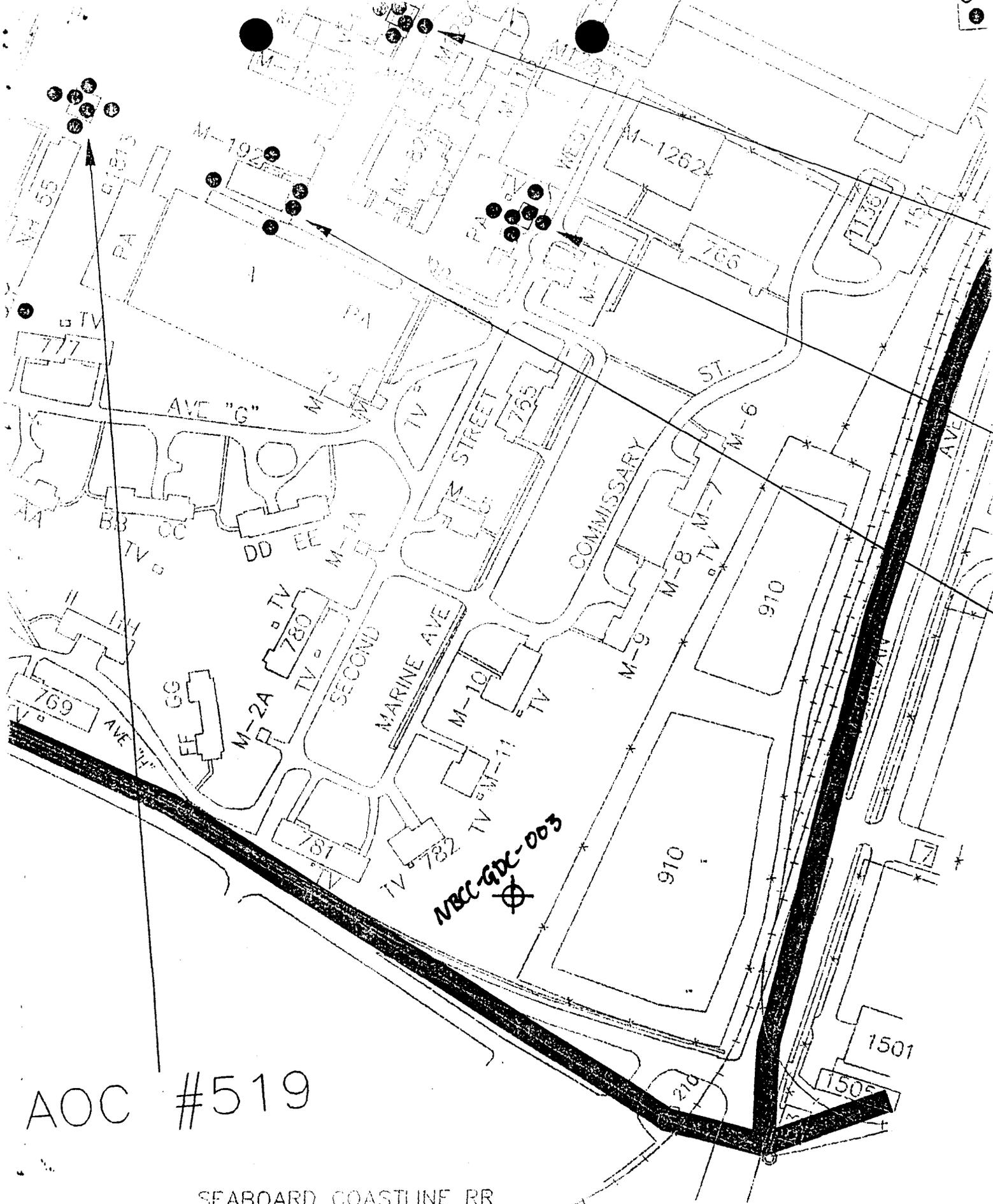
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1845

662

903

FW STORAGE



AOC #519

SEABOARD COASTLINE RR

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44

Commissioner: Douglas E. Bryant

Board: John H. Burriss, Chairman
Sandra J. Molander, Secretary

Richard E. Jabbour, DDS
William M. Hull, Jr., MD
Roger Leaks, Jr.

Promoting Health, Protecting the Environment

CERTIFIED MAIL

July 11, 1995

Mr. Ralph L. Laney, Code 106
Director, Occupational Safety,
Health and Environmental Office
Charleston Naval Shipyard
Charleston, South Carolina 29408-6100

RE: Charleston Naval Base and Shipyard (NAVBASE)
SC0 170 022 560
Charleston County

Monitoring Well Approval for Area of Concern 626 - Naval Supply Center Fuel Farm
(Stockmaster to Bowers, 7/11/95)

Dear Mr. Laney:

The above referenced correspondence has been reviewed with respect to the requirements of R.61-79.264.101(d) of the South Carolina Hazardous Waste Management Regulations, the U.S. Region IV Standard Operating Procedures and Quality Assurance Manual, the South Carolina Well Standards and Regulations, R.61-71, and appropriate guidance documents.

Approval for installation of monitoring wells at Area of Concern (AOC) 626 was requested in phone conversations between the writer and Mr. Tony Hunt of Southern Division Naval Facilities Engineering Command. Mr. Hunt explained that Naval Base Charleston (NAVBASE) wished to demonstrate a new technology, referred to as the Site Characterization and Analysis Penetrometer System (SCAPS). This is a relatively new technology that uses direct push technology coupled with a fiber optic sensor to determine the presence of hydrocarbon

contamination in the subsurface. Note that although this is a direct push technology rather than a conventional method of monitoring well installation, NAVBASE is required to receive approval prior to demonstrating this technology, in accordance with R.61-71.11.E of the South Carolina Well Standards and Regulations, and R.61-79.264.101(d) of the South Carolina Hazardous Waste Management Regulations. A maximum of approximately 40 locations will be sampled using this technology.

Attached please find a Monitoring Well Approval Form for the installation of the monitoring wells discussed above. Note the other conditions of approval included on this form. Should you have any questions regarding the attached well approval form, you may contact me at (803) 896-4024.

Respectfully,



Joe B. Bowers, Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Solid and Hazardous Waste Management

Attachments

cc: Brian Stockmaster, Southern Division
Tony Hunt, Southern Division
Christine Sanford-Coker, Trident District Office
David Walton, Hazardous Waste Permitting Section
Tim Mettlen, Ground Water Protection Division
Doyle Brittain, EPA Region IV

Monitoring Well Installation Approval

Date of Issue: July 11, 1995 Approval No.: HW-95-0028

Approval is hereby granted to: Mr. Ralph L. Laney
on behalf of: Charleston Naval Shipyard

Permit or SCD #: SC0 170 022 560
County: Charleston

This approval is for the collection of groundwater quality data at approximately 40 locations in the vicinity of Area of Concern (AOC) 626 - Naval Supply Center Fuel Farm. The wells are to be constructed within the surficial aquifer for the intended purpose of monitoring groundwater quality and water levels.

Approval is provided with the following conditions:

1. Monitoring wells shall be installed by a well driller certified by the State of South Carolina.
2. Well construction and sampling derived waste including, but not limited to, drill cuttings, drilling fluids, development and purge water should be managed properly and in compliance with applicable requirements. If containerized, each container should be clearly labeled with regard to contents, source, and date of activity.
3. Groundwater quality analytical data, water level(s), and/or in-situ field measurements should be provided to the Hazardous Waste Section within thirty (30) days of generation.
4. That the borehole be grouted with a mixture of cement, bentonite, and water upon completion of sampling.

This approval is pursuant to the provisions of Section 4-5540 of the 1976 South Carolina Code of Laws and the Department of Health and Environmental Control Regulations R.61-79.264.101(d) and R.61-71.

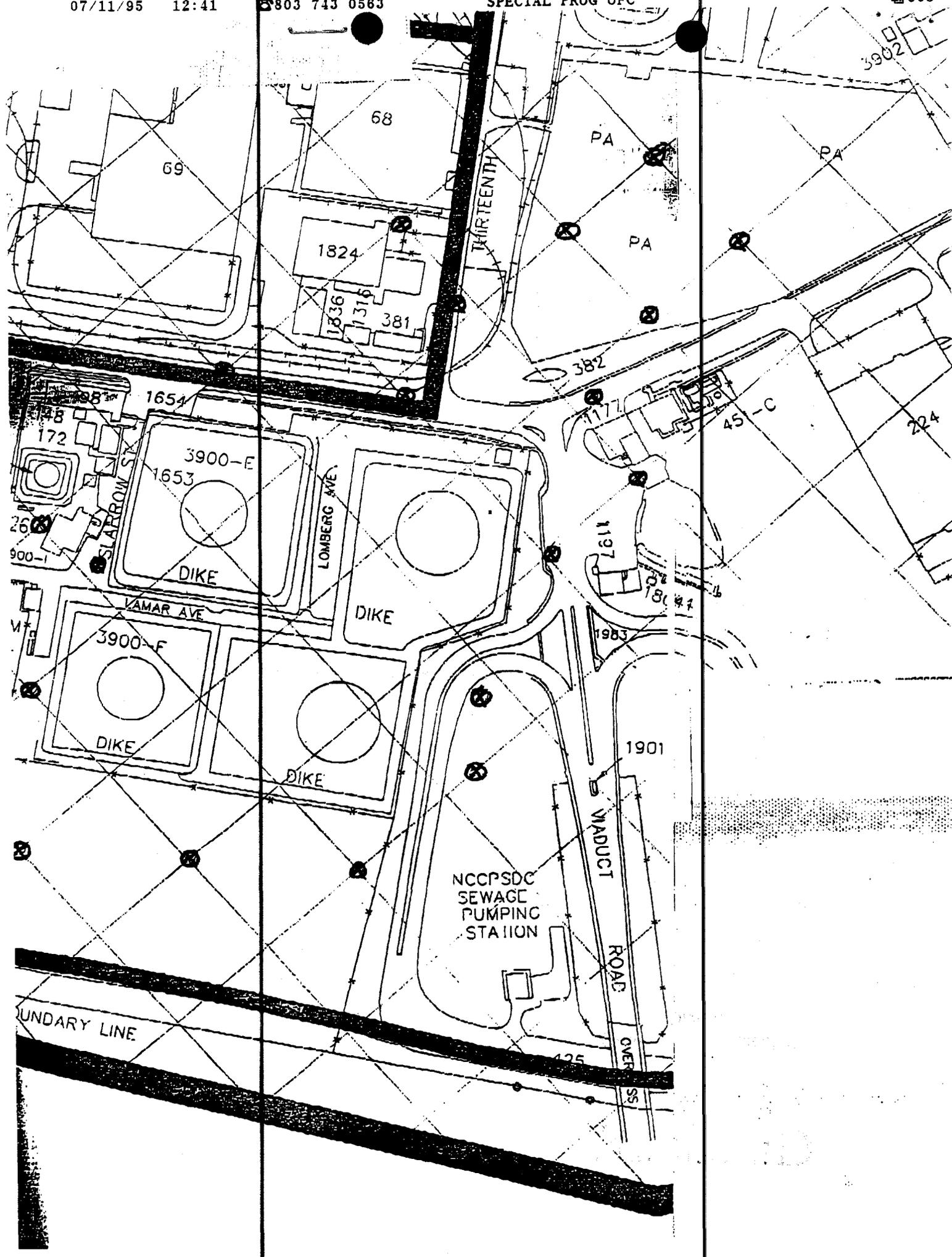
Approved by: Joe B Bowers

Division
Groundwater Protection

JUL 12 1995

RECEIVED
cna7.35

Joe B. Bowers, Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Solid and Hazardous
Waste Management



Commissioner: Douglas E. Bryant

Board: Richard E. Jabbour, DDS, Chairman
Robert J. Stripling, Jr., Vice Chairman
Sandra J. Molander, Secretary

William E. Applegate, III,
John H. Burriss
Tony Graham, Jr., MD
John B. Pate, MD

Promoting Health, Protecting the Environment

CERTIFIED MAIL

August 29, 1994

Mr. Ralph L. Laney, Code 106
Director, Occupational Safety,
Health and Environmental Office
Charleston Naval Shipyard
Charleston, South Carolina 29408-6100

RE: Charleston Naval Base and Shipyard (NAVBASE)
SCO 170 022 560
Charleston County

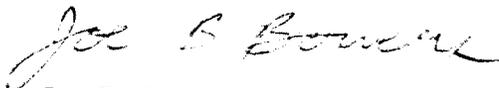
Additional Monitoring Well Pair at SWMU 14 (Chemical Disposal Area)

Dear Mr. Laney:

In correspondence dated August 16, 1994, the Department granted approval to the Charleston Naval Base and Shipyard (NAVBASE) for the installation of monitoring wells in the area of the base known as Zone H (Bowers to Laney, 8/16/94). Per this approval, four monitoring well pairs were to be installed in the vicinity of Solid Waste Management Unit (SWMU) 14 (Chemical Disposal Area). However, in a meeting I attended at NAVBASE on Tuesday August 23, 1994, I learned that an additional monitoring well pair was planned for installation at SWMU 14. Thus, a total of five monitoring well pairs will be installed at SWMU 14.

Attached please find a Monitoring Well Approval Form for the installation of this additional monitoring well pair at SWMU 14. Note the other conditions of approval included on this form. Should you have any questions regarding the attached well approval form, you may contact me at (803) 734-5484.

Respectfully,



Joe B. Bowers, Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Solid and Hazardous Waste Management

cc: Tony Hunt, Southern Division
Todd Haverkost, Ensafe - Charleston, SC
Christine Sanford-Coker, Trident District Office
David Walton, Hazardous Waste Permitting Section
██████████, Ground Water Protection Division
Doyle Brittain, EPA Region IV

RECEIVED

AUG 20 1994

Groundwater Protection
Division

Attachment

Monitoring Well Installation Approval

Date of Issue: August 29, 1994 Approval No.: HW-94-0055

Approval is hereby granted to: Mr. Ralph L. Laney
on behalf of: Charleston Naval Shipyard

Permit or SCD #: SC0 170 022 560
County: Charleston

This approval is for the construction of monitoring wells designated CNSY-14-05 and CNSY-14-05D in accordance with the construction plans and specifications included in the Draft Zone H Workplan (dated 7/8/94). The wells are to be constructed within the surficial aquifer for the intended purpose of monitoring groundwater quality and water levels. Approval is provided with the following conditions:

1. The latitude and longitude, surveyed elevations, boring and/or geologist logs and "as built" construction details for each well be submitted within thirty (30) days of completion of the last well.
2. Each well shall be labeled with an identification plate constructed of a durable material affixed to the casing or surface pad where it is readily visible. The plate shall provide the monitoring well identification number, date of construction, static water level, and driller name and state certification number.
3. Well construction and sampling derived waste including, but not limited to, drill cuttings, drilling fluids, development and purge water should be managed properly and in compliance with applicable requirements. If containerized, each vessel should be clearly labeled with regard to contents, source, and date of activity.
4. Groundwater quality analytical data, water level(s), and associated measurements (i.e.,

in-situ field measurements) should be provided to the Hazardous Waste Section within ninety (90) days of receipt from the laboratory.

- 5 Monitoring wells shall be installed by a well driller certified by the State of South Carolina.
- 6 A minimum of 48 hours prior to installation, notice should be provided to Ms. Christine Sanford-Coker of the Trident District EQC Office at (803) 740-1590 and Mr. Joe Bowers at (803) 734-5484.

This approval is pursuant to the provisions of Section 4-5540 of the 1976 South Carolina Code of Laws and the Department of Health and Environmental Control Regulations R.61-71.

Approved by: Joe B Bowers

Joe B. Bowers, Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Solid and Hazardous
Waste Management

cnav.34

CERTIFIED MAIL

March 10, 1995

Mr. Ralph L. Laney, Code 106
Director, Occupational Safety,
Health and Environmental Office
Charleston Naval Shipyard
Charleston, South Carolina 29408-6100

MAR 13 1995
Groundwater Protection
Division

RE: Charleston Naval Base and Shipyard (NAVBASE)
SCO 170 022 560
Charleston County

Monitoring Well Approval for Zone I (Gray to Bowers, 2/15/95)

Dear Mr. Laney:

In the above referenced correspondence, approval is requested from the Department for the installation of a total of 55 monitoring wells in Zone I. Nineteen of these monitoring wells (NBCI-GRD-001 through NBCI-GRD-019) will be shallow (installed to approximately 15 feet total depth) grid-based monitoring wells, 19 other wells (NBCI-GRD-01D through NBCI-GRD-19D) will be deep (installed to approximately 45 to 75 feet total depth) grid-based monitoring wells. The remainder of the wells (NBCI-671-001 through -004, NBCI-678-001, NBCI-012-001 through -003, NBCI-675-001 and -002, NBCI-677-001 and -002, NBCI-676-001, and NBCI-016-001 through -004) are shallow monitoring wells and will be installed around the following Solid Waste Management Unit (SWMUs) and/or Areas of Concern (AOCs): SWMUs 12 and 16; AOCs 671, 672, 673, 675, 676, 677, 678, 679, 685, 687, 688, and 690.

Note that this correspondence approves only the installation of monitoring wells; it does not constitute the Department's approval of the Final Zone I RFI Workplan (dated 2/24/95) and the associated response to comments (Nold to Franzmathes, 2/27/95). When the Department's

review of the Final Zone I RFI Workplan and response to comments is complete, and when the Department is satisfied with the workplan, then a letter formally approving the workplan will be issued.

Attached please find a Monitoring Well Approval Form for the installation of the monitoring wells discussed above. Note the other conditions of approval included on this form. Should you have any questions regarding the attached well approval form, you may contact me at (803) 896-4024.

Respectfully,



Joe B. Bowers, Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Solid and Hazardous Waste Management

Attachment

cc: Tony Hunt, Southern Division
Christine Sanford-Coker, Trident District Office
David Walton, Hazardous Waste Permitting Section
Tim Mettlen, Ground Water Protection Division
Doyle Brittain, EPA Region IV

Monitoring Well Installation Approval

Date of Issue: March 10, 1995 Approval No.: HW-95-0008

Approval is hereby granted to: Mr. Ralph L. Laney
on behalf of: Charleston Naval Shipyard

Permit or SCD #: SC0 170 022 560
County: Charleston

This approval is for the construction of 55 monitoring wells designated NBCI-GRD-001/01D through NBCI-GRD-019/19D, NBCI-671-001 through -004, NBCI-678-001, NBCI-012-001 through -003, NBCI-675-001 and -002, NBCI-677-001 and -002, NBCI-676-001, and NBCI-016-001 through -004 in accordance with the construction plans and specifications included in the Final Comprehensive Sampling and Analysis Plan (dated 8/30/94). The wells will be installed in the locations depicted in the Final Zone I RFI Workplan (dated 2/24/95). The wells are to be constructed within the surficial aquifer for the intended purpose of monitoring groundwater quality and water levels. Approval is provided with the following conditions:

1. The latitude and longitude, surveyed elevations, boring and/or geologist logs and "as built" construction details for each well be submitted within thirty (30) days of completion of the last well.
2. Each well shall be labeled with an identification plate constructed of a durable material affixed to the casing or surface pad where it is readily visible. The plate shall provide the monitoring well identification number, date of construction, static water level, and driller name and state certification number.
3. Well construction and sampling derived waste including, but not limited to, drill cuttings, drilling fluids, development and purge water should be managed properly and in compliance with applicable requirements. If containerized, each vessel should be clearly

labeled with regard to contents, source, and date of activity.

4. Groundwater quality analytical data, water level(s), and associated measurements (i.e., in-situ field measurements) should be provided to the Hazardous Waste Section within ninety (90) days of receipt from the laboratory.
5. Monitoring wells shall be installed by a well driller certified by the State of South Carolina.
6. A minimum of 48 hours prior to installation, notice should be provided to Ms. Christine Sanford-Coker of the Trident District EQC Office at (803) 740-1590 and Mr. Joe Bowers at (803) 896-4024.

This approval is pursuant to the provisions of Section 4-5540 of the 1976 South Carolina Code of Laws and the Department of Health and Environmental Control Regulations R.61-71.

Approved by: Joe B Bowers

Joe B. Bowers, Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Solid and Hazardous
Waste Management

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CERTIFIED MAIL

March 20, 1995

Mr. Ralph L. Laney, Code 106
Director, Occupational Safety,
Health and Environmental Office
Charleston Naval Shipyard
Charleston, South Carolina 29408-6100

RECEIVED

MAR 23 1995

Groundwater Protection
Division

CNB-General

RE: Charleston Naval Base and Shipyard (NAVBASE)
SC0 170 022 560
Charleston County

- Monitoring Well Approval for Zone C (Neisse to Bowers, 3/6/95)
- Request for Additional Wells at SWMUs 17 and 20 (Dotson to Bowers, 3/14/95)

Dear Mr. Laney:

The above referenced correspondence have been reviewed with respect to the requirements of R.61-79.264 Subpart F of the South Carolina Hazardous Waste Management Regulations, the U.S. Region IV Standard Operating Procedures and Quality Assurance Manual, the South Carolina Well Standards and Regulations, R.61-71, and appropriate guidance documents.

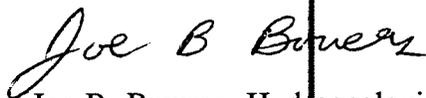
The first correspondence noted above requests approval from the Department for the installation of a total of 31 monitoring wells in the area of the base known as Zone C. The wells will be installed in accordance with procedures described in the Final Comprehensive Sampling and Analysis Plan, dated August 30, 1994 and the Final Zone C RFI Workplan, dated February 24, 1995. Twenty seven wells (NBCC-044-001 through -008, NBCC-047-01 through -15, NBCC-510-001 & -002, and NBCC-523-001 & -002) will be installed in the vicinities of Solid Waste Management Units (SWMUs) 44 (Coal Storage Area) and 47 (Burning Dump), and Areas of Concern (AOCs) 510 (Geotechnical Laboratory) and 523 (Former Gas Station). Four of the wells (NBCC-GRD-001 & -01D and NBCC-GRD-002 & -02D) will be Zone C grid-based monitoring wells.

The second correspondence requests approval from the Department for the installation of a total of six (6) monitoring wells. Two additional wells (NBCH-017-005 and NBCH-017-006) are proposed for installation around SWMU 17 (Oil Spill Area). Four additional wells (NBCH-009-016 through NBCH-009-020) are proposed for installation around SWMU 20 (Waste Disposal Area). These wells are being installed in an effort to fully determine the extent of groundwater contamination detected at these SWMUs.

Please note that this correspondence approves only the installation of monitoring wells; it does not constitute the Department's approval of the Final Zone C RFI Workplan (dated 2/24/95) and the associated response to comments (Nold to Franzmathes, 2/27/95). When the Department's review of the Final Zone C RFI Workplan and response to comments is complete, and when the Department is satisfied with the workplan, then a letter formally approving the workplan will be issued.

Attached please find a Monitoring Well Approval Form for the installation of the monitoring wells discussed above. Note the other conditions of approval included on this form. Should you have any questions regarding the attached well approval form, you may contact me at (803) 896-4024.

Respectfully,



Joe B. Bowers, Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Solid and Hazardous Waste Management

Attachment

cc: Tony Hunt, Southern Division
Christine Sanford-Coker, Trident District Office
David Walton, Hazardous Waste Permitting Section
Tim Mettlen, Ground Water Protection Division
Doyle Brittain, EPA Region IV

Monitoring Well Installation Approval

Date of Issue: March 20, 1995 Approval No.: HW-95-0010

Approval is hereby granted to: Mr. Ralph L. Laney
on behalf of: Charleston Naval Shipyard

Permit or SCD #: SC0 170 022 560
County: Charleston

This approval is for the construction of a total of 31 monitoring wells in the area of the base known as Zone C. The wells will be installed in accordance with procedures described in the Final Comprehensive Sampling and Analysis Plan, dated August 30, 1994 and the Final Zone C RFI Workplan, dated February 24, 1995. Twenty seven wells, **NBCC-044-001 through -008**, **NBCC-047-01 through -15**, **NBCC-510-001 & -002**, and **NBCC-523-001 & -002**, will be installed in the vicinities of Solid Waste Management Units (SWMUs) 44 (Coal Storage Area) and 47 (Burning Dump), and Areas of Concern (AOCs) 510 (Geotechnical Laboratory) and 523 (Former Gas Station). Four of the wells, **NBCC-GRD-001 & -01D** and **NBCC-GRD-002 & -02D**, will be Zone C grid-based monitoring wells. The wells will be installed in the locations depicted in the Final Zone C RFI Workplan (dated 2/24/95). The wells are to be constructed within the surficial aquifer for the intended purpose of monitoring groundwater quality and water levels.

Approval is also granted for the installation of **NBCH-017-005** and **NBCH-017-006**, and **NBCH-009-016** through **NBCH-009-020** in the vicinities of SWMUs 17 (Oil Spill Area) and 20 (Waste Disposal Area), respectively. These wells will be installed in accordance with procedures described in the Final Comprehensive Sampling and Analysis Plan, dated August 30, 1994, and in the locations described in Dotson to Bowers, dated 3/14/95. The wells are to be constructed within the surficial aquifer for the intended purpose of monitoring groundwater quality and water levels.

Approval is provided with the following conditions:

1. The latitude and longitude, surveyed elevations, boring and/or geologist logs and "as built" construction details for each well be submitted within thirty (30) days of completion of the last well.
2. Each well shall be labeled with an identification plate constructed of a durable material affixed to the casing or surface pad where it is readily visible. The plate shall provide the monitoring well identification number, date of construction, static water level, and driller name and state certification number.
3. Well construction and sampling derived waste including, but not limited to, drill cuttings, drilling fluids, development and purge water should be managed properly and in compliance with applicable requirements. If containerized, each vessel should be clearly labeled with regard to contents, source, and date of activity.
4. Groundwater quality analytical data, water level(s), and associated measurements (i.e., in-situ field measurements) should be provided to the Hazardous Waste Section within ninety (90) days of receipt from the laboratory.
5. Monitoring wells shall be installed by a well driller certified by the State of South Carolina.
6. A minimum of 48 hours prior to installation, notice should be provided to Ms. Christine Sanford-Coker of the Trident District EQC Office at (803) 740-1590 and Mr. Joe Bowers at (803) 896-4024.

This approval is pursuant to the provisions of Section 4-5540 of the 1976 South Carolina Code of Laws and the Department of Health and Environmental Control Regulations R.61-71.

Approved by:

Joe B Bowers

Joe B. Bowers, Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Solid and Hazardous
Waste Management

South Carolina
DHEC

Department of Health and Environmental Control
2600 Bull Street, Columbia, SC 29201

Commissioner: Douglas E. Bryant

Board: Richard E. Jabbour, DDS, Chairman
Robert J. Stripling, Jr., Vice Chairman
Sandra J. Molander, Secretary

William E. Applegate, III,
John H. Burriss
Tony Graham, Jr., MD
John B. Pate, MD

Promoting Health, Protecting the Environment

CERTIFIED MAIL

August 16, 1994

Mr. Ralph L. Laney, Code 106
Director, Occupational Safety,
Health and Environmental Office
Charleston Naval Shipyard
Charleston, South Carolina 29408-6100

RECEIVED

AUG 18 1994

Groundwater Protection
Division

RE: Charleston Naval Shipyard (CNAV)
SC0 170 022 560
Charleston County

Request for Zone H Monitoring Well Installation Approval (Dotson to Bowers, 7/20/94)

Dear Mr. Laney:

The above referenced request for monitoring well installation approval has been reviewed with respect to R.61-79.264 Subpart F of the South Carolina Hazardous Waste Management Regulations, the South Carolina Well Standards and Regulations (R.61-71), conditions of Hazardous Waste Permit SC0 170 022 560, and appropriate guidance documents. In the above referenced correspondence, approval is requested from the Department to install a total of 70 monitoring wells. Of this number, 46 will be installed to investigate the potential of groundwater contamination at Solid Waste Management Units (SWMUs) **9** (Closed Landfill), **13** (Current Fire Fighter Training Area), **14** (Chemical Disposal Area), **17** (Oil Spill Area), **178** (Former Transformer Area 50 feet south of Building X-33A) and Areas of Concern (AOCs) **653** (Building 1508 MWR Hobby Shop), **655** (Building 656 Oil Spill Area), **656** (Petroleum Spill Between Buildings 602 and NS-71), **660** (Former Building 31 Mosquito Control), **662** (Building NS-54 Former Gas Station), **663** (Building 851 Gas/Diesel Pumping Station), **666** (Fuel Storage (NS-45)) and **667** (CBU-412 Vehicle Maintenance Area).

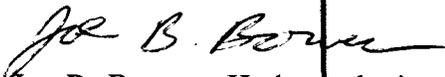
The 24 remaining monitoring wells will be installed as part of the base-wide monitoring well grid system. In addition, this correspondence requests approval to conduct groundwater screening at 22 locations in the vicinity of SWMU 9 (Closed Landfill) using Geoprobe or Hydropunch technology. All of the proposed monitoring wells are being installed in accordance

with the Zone H RFI Workplan, dated July 8, 1994, and any subsequent Department-approved revisions.

In addition to the wells discussed above, in a meeting held August 11, 1994 and a subsequent conference call on August 15, 1994, it was agreed that an additional pair of monitoring wells should be installed on the north-eastern side of SWMU 14 (Chemical Disposal Area). Those included in the conference call included the writer, Doyle Brittain of the EPA, Thuane Fielding and Tony Hunt from Southern Division, and Todd Haverkost and Sam Weatherford from Ensafe. The approximate location of this well pair was also agreed to in this conference call, as depicted on the figure attached to this correspondence. Installation of this pair of monitoring wells has been made a condition of this monitoring well approval.

A Monitoring Well Approval Form is attached to this correspondence. Please note the other conditions of approval included on this form. Should you have any questions regarding the attached well approval form, you may contact me at (803) 734-5484.

Respectfully,



Joe B. Bowers, Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Solid and Hazardous Waste Management

cc: Christine Sanford-Coker, Trident District Office
David Walton, Hazardous Waste Permitting Section
~~The Hazardous Waste Permitter Division~~
Doyle Brittain, EPA Region IV

Attachments

Monitoring Well Installation Approval

Date of Issue: August 16, 1994 Approval No.: HW-94-0045

Approval is hereby granted to: Mr. Ralph L. Laney
on behalf of: Charleston Naval Shipyard

Permit or SCD #: SC0 170 022 560
County: Charleston

This approval is for the construction of monitoring wells designated CNSY-13-01 through 7, CNSY-14-01 through 4, CNSY-14-01D through 4D, CNSY-17-01 through 4, CNSY-653-01, CNSY-653-02, CNSY-655-01 through 3, CNSY-656-01 through 3, CNSY-662-01, CNSY-662-02, CNSY-663-01 through 3, CNSY-667-01, CNSY-667-02, CNSY-660-01, CNSY-660-02, CNSY-666-01, CNSY-666-02, CNSY-178-01, CNSY-178-02, CNSY-9-1D through 8D, CNSY-GRIDH-1 through 12, and CNSY-GRIDH-1D through 12D in accordance with the construction plans and specifications included in the Draft Zone H Workplan (dated 7/8/94) and as included in Dotson to Bowers, 7/20/94. The wells are to be constructed within the surficial aquifer for the intended purpose of monitoring groundwater quality and water levels. Approval is provided with the following conditions:

1. An additional monitoring well pair will be installed in the area of SWMU 14 (Chemical Disposal Area). The approximate location of the monitoring well pair is indicated on the figure attached to this well approval.
2. The latitude and longitude, surveyed elevations, boring and/or geologist logs and "as built" construction details for each well be submitted within thirty (30) days of completion of the last well.
3. Each well shall be labeled with an identification plate constructed of a durable material affixed to the casing or surface pad where it is readily visible. The plate shall provide

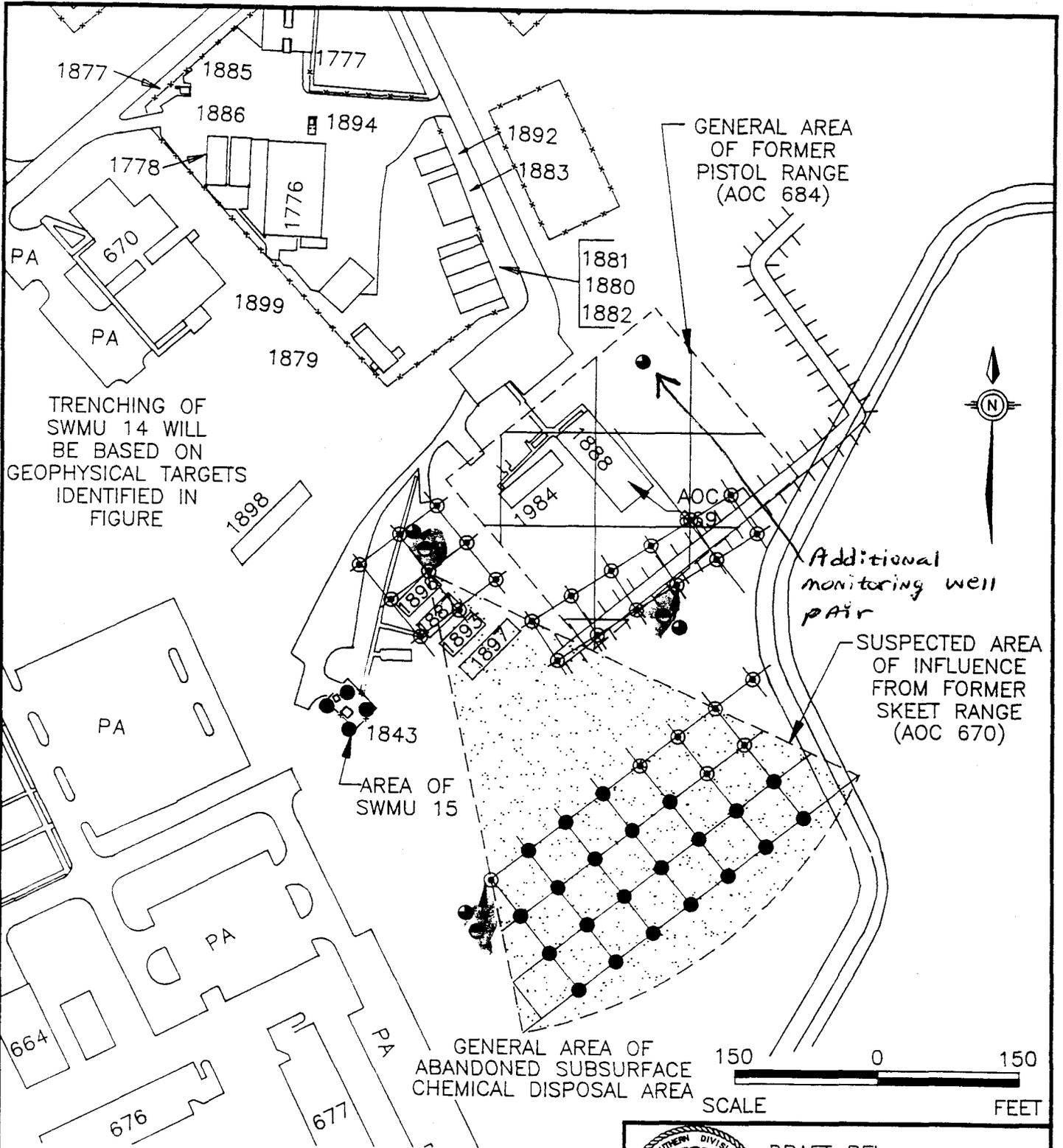
the monitoring well identification number, date of construction, static water level, and driller name and state certification number.

4. Well construction and sampling derived waste including, but not limited to, drill cuttings, drilling fluids, development and purge water should be managed properly and in compliance with applicable requirements. If containerized, each vessel should be clearly labeled with regard to contents, source, and date of activity.
5. Groundwater quality analytical data, water level(s), and associated measurements (i.e., in-situ field measurements) should be provided to the Hazardous Waste Section within ninety (90) days of receipt from the laboratory.
6. Monitoring wells shall be installed by a well driller certified by the State of South Carolina.
7. A minimum of 48 hours prior to installation, notice should be provided to Ms. Christine Sanford-Coker of the Trident District EQC Office at (803) 740-1590 and Mr. Joe Bowers at (803) 734-5484.

This approval is pursuant to the provisions of Section 4-5540 of the 1976 South Carolina Code of Laws and the Department of Health and Environmental Control Regulations R.61-71.

Approved by: 

Joe B. Bowers, Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Solid and Hazardous
Waste Management



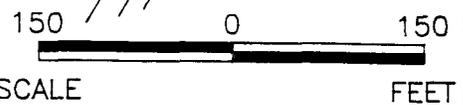
TRENCHING OF SWMU 14 WILL BE BASED ON GEOPHYSICAL TARGETS IDENTIFIED IN FIGURE

Additional monitoring well pair

SUSPECTED AREA OF INFLUENCE FROM FORMER SKEET RANGE (AOC 670)

AREA OF SWMU 15

GENERAL AREA OF ABANDONED SUBSURFACE CHEMICAL DISPOSAL AREA



LEGEND

- ⊙ - SOIL BORING TO BE ANALYZED FOR APP. IX PARAMETERS
- - SOIL BORING TO BE ANALYZED FOR STANDARD ANALYTICAL PARAMETERS
- - SHALLOW GROUNDWATER MONITORING WELL
- - ~~DEEP GROUNDWATER MONITORING WELL~~
- ||| - FORMER BERM AREA



DRAFT RFI
 ZONE H WORKPLAN
 NAVAL BASE CHARLESTON
 CHARLESTON, S.C.

FIGURE 2-6
 SWMU 14, SWMU 15,
 AOC 684 AND AOC 670
 PROPOSED SAMPLE LOCATIONS

Non-Standard Monitoring Well Installation Approval

Date of Issue: August 16, 1994

Approval No.: HW-94-0046

Approval is hereby granted to:
on behalf of:

Mr. Ralph L. Laney
Charleston Naval Shipyard

Permit or SCD #:
County:

SC0 170 022 560
Charleston

for the collection of groundwater samples from 22 locations in the vicinity of SWMU 9 (Closed Landfill) using the Hydropunch or Geoprobe technology at the locations included in the Draft Zone H Workplan, dated July 8, 1994. These non-standard wells will be installed in accordance with the procedures included in Section 6.1 of the Draft Comprehensive Sampling and Analysis Plan, dated May 18, 1994, and Dotson to Bowers, dated July 20, 1994.

Conditions:

1. Analytical results generated from samples collected from these non-standard wells cannot be used to prove the absence of groundwater contamination.
2. The requirements of R.61-71.11.C(1-7) for completing these wells as permanent monitoring wells are waived.
3. The non-standard wells must be installed by a driller certified to operate in the State of South Carolina.
4. Well construction and sampling derived waste including, but not limited to, drill cuttings, drilling fluids, development and purge water should be managed properly and in compliance with applicable requirements. If containerized, each vessel should be clearly labeled with regard to contents, source, and date of activity.

5. Groundwater quality analytical data, water level(s), and associated measurements (i.e., in-situ field measurements) should be provided to the Hazardous Waste Section within ninety (90) days of receipt of the data from a laboratory or the date of analysis in the field.
6. A minimum of 48 hours prior to installation, notice should be provided to Ms. Christine Sanford-Coker of the Trident District EQC Office at (803) 740-1590 and Mr. Joe Bowers at (803) 734-5484.

This approval is pursuant to the provisions of Section 4-5540 of the 1976 South Carolina Code of Laws and the Department of Health and Environmental Control Regulations R.61-71.

Approved by: Joe B. Bowers

Joe B. Bowers, Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Solid and Hazardous
Waste Management

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