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MCRD PARRIS ISLAND
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LETTER REGARDING U S NAVY REQUEST FOR WELL PERMIT FOR REMEDIAL INVESTIGATION/RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION AT SITE 45 WITH ATTACHMENTS MCRD PARRIS ISLAND SC
2/17/2005
TETRA TECH NUS

TETRA TECH NUS, INC.
661 Andersen Drive • Pittsburgh, PA 15220
Tel 412.921.7090 • Fax 412.921.4040 • www.tetratech.com

PITT–02-5-035

February 17, 2005

Project Number 5260

Department of Health & Environmental
Control (DHEC)/BLWM
8901 Farrow Road
Columbia, South Carolina 29223

ATTN: Mike Danielsen

Reference: CLEAN Contact No. N62467-94-D-0888
Contract Task Order No. 335

Subject: Well Permit Request for RFI/RI Addendum
SWMU/Site 45 (Former MWR Dry Cleaning Facility)
Marine Corps Recruit Depot (MCRD) Parris Island, South Carolina

Dear Mr. Danielsen:

On the behalf of the Navy and MCRD, Tetra Tech NUS, Inc. is submitting this request for well permit at SWMU/Site 45 (Former MWR Dry Cleaning Facility). Approvals should be coordinated directly with Tim Harrington of MCRD Parris Island. The specific field work tasks are described in the RFI/RI Addendum Work Plan (TtNUS, December 2004). The workplan was approved by SCDHEC's letter of February 10, 2005, from Leon Fulmer to Art Sanford. Field work is scheduled to begin on Tuesday, February 15 with membrane interface probe (MIPS) testing to determine locations for future temporary wells. The temporary wells and MIPs results will be evaluated to determine ultimate locations for new permanent monitoring wells. The attached tables 4-1, 4-2, and 4-3 from the workplan and the attached Figure 7-1 provide details from the workplan.

MIPs points (58 locations) and temporary monitoring wells (15 locations) will be advanced by direct push (DPT). Hollow-stem auger drilling techniques will be used to install permanent monitoring wells (24 wells; nested pairs at 3-8 ft. bgs and 9-14 ft bgs in the surficial aquifer, plus 5 deeper wells screened at approximately 30-40 ft. bgs. Actual permanent well locations will be determined following review of MIPs and temporary well screening results. The wells will be constructed of 2-inch inside diameter (ID), Schedule 40, flush-joint, PVC riser pipe and flush-joint, factory-slotted well screen. Each section of casing and screen will be National Sanitation Foundation (NSF) approved. Well screens will be 10 feet in length, with a 0.01-inch slot size.

The top of the screened interval for the shallow aquifer permanent wells will be positioned approximately 1 to 2 feet above the stabilized water level in the borehole, if possible. Wells will be installed through the augers using the following procedure. The well riser and screen will be joined and lowered to the desired depth within the well boring, inside the augers. A silica sand pack (Nos. 20 to 30 U.S. Standard Sieve size) will be installed into the boring annulus around the well screen as the augers are withdrawn from the boring. The sand pack will be installed from the bottom of the hole to a level of approximately 2 feet above the top of the well screen. A bentonite pellet seal approximately 2 feet thick will be installed above the sand pack and allowed to hydrate. The remainder of the annulus of the boring (from the seal to the ground surface) will be tremie backfilled with a cement/bentonite grout. Deep surficial aquifer monitoring

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wells will be installed inside 6 inch steel casing to be set into the clay layer. See attached figures 6-1 and 6-2.

Wells will be installed as flush-mounts. The monitoring wells will be developed as soon as practical after well installation but not sooner than 24 hours after grout set time and optimally after the protective casing installation.

A South Carolina certified driller(s) will perform the soil borings and permanent monitoring wells. All locations will be surveyed by a State certified surveyor. The decontamination water, purge water, and drill cuttings will be containerized and sampled prior to disposal.

In addition, one pump-handle drinking water well on nearby SWMU 12 will be abandoned and removed per SCHDEC requirements, per a long-standing SCDHEC request.

Field forms associated with the effort (i.e., survey information and boring logs) will be submitted with the Draft RFI/RI Addendum Report or earlier (prior to completion of the RFI/RI Addendum Report), if requested by SCDHEC or during presentations at team meetings. In the interim, on behalf of the Navy, TtNUS will inform the Department of unexpected analytes and/or elevated concentrations as data is received.

Very truly yours,

Mark Sladic, P.E.
Task Order Manager

Attachments

c: Art Sanford, NAVFAC EFD SOUTH
Tim Harrington, MCRD Parris Island
Leon Fulmer, SCDHEC
Stan Conti, TtNUS
D. Humbert (cover letter only)
M. Perry/File 5260, CTO 335

TABLE 4-1

INVESTIGATION RATIONALE
SITE 45 – FORMER MWR DRY CLEANING FACILITY
MCRD PARRIS ISLAND, SOUTH CAROLINA

Medium	Identified/Suspected Contaminants	Preliminary Assessment	Data Gap/Need	Resolution Of Data Gap/Need
Groundwater	VOCs: PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride.	Groundwater is a risk to human health. Extent of plume is uncertain. Vapor intrusion may pose an unacceptable risk to human health.	RI/RFI Addendum • Nature and extent characterization • Vapor intrusion risk evaluation FS/CMS • Modeling • Site hydrogeology	• VOCs • Additonal monitoring wells • Vapor intrusion modeling parameters • Water-level measurements

Note:
FS/CMS – Feasibility Study/Corrective Measures Study.

TABLE 4-2

SITE-SPECIFIC INVESTIGATION SUMMARY
SITE 45 – MWR DRY CLEANING FACILITY
MCRD PARRIS ISLAND, SOUTH CAROLINA

Medium	Data Gap/Need	Investigation Activity	Number of Locations	Samples per Location[1]	Analysis
Saturated Soil	• Nature and Extent	• Collect peat samples	6	1	None
	• Determine if DNAPL is present	• Field screening	18	1 to 3 tests per location based on PID reading	Fluorescent light screening
	• Soil Classification/ Logging	• Document soil characteristics during soil boring, MIP/SC, and monitoring well installation (temporary and permanent).	Up to 58 MIP, and an estimated 5 contingency MIP	Continuous	Field characterization, MIP/SC
Groundwater	• Profiling wells	• Collect shallow groundwater samples (temporary wells).	Up to 15	1	TCL VOCs – 48 hour turn-around time
	• Nature and extent wells	• Collect groundwater samples (permanent wells).	12 new shallow upper wells, 12 new shallow lower wells, 5 new deep wells, 15 existing wells	1	TCL VOCs
	• Water-quality parameters (collected in field)	• Measure during groundwater sampling	All groundwater samples	1	Dissolved oxygen, salinity, pH, specific conductivity, turbidity, temperature
	• Groundwater flow	• Synoptic water-level measurements • Survey new wells	29 new wells, 21 existing wells, 3 existing piezometers	1 round	Field measurements
Indoor Air	• Vapor intrusion model inputs	• Inspect for basements • Survey • Copy drawings	2 buildings	Not applicable	Field measurements

Notes:
1. Does not include QA/QC samples.

TABLE 4-3

SAMPLE SUMMARY
RI/RFI ADDENDUM WORK PLAN
MCRD PARRIS ISLAND, SOUTH CAROLINA

Sample Number or Boring Number	Location/ Matrix	Analyses	Location/depth Rationale
Soil Borings			
PAI-45-SB-101	SB-101	MIP	Upgradient. 30 feet, baseline MIP information
PAI-45-SB-102	SB-102	MIP	Evaluate upgradient diffusion of source area
PAI-45-SB-103	SB-103	MIP	Evaluate upgradient diffusion of source area
PAI-45-SB-104	SB-104	MIP	Evaluate upgradient diffusion of source area
PAI-45-SB-105	SB-105	MIP	Evaluate upgradient diffusion of source area
PAI-45-SB-106	SB-106	MIP	Evaluate upgradient diffusion of source area
PAI-45-SB-107	SB-107	MIP	Evaluate eastward diffusion of source area
PAI-45-SB-108	SB-108	MIP	Evaluate westward extent of contamination, potential source area
PAI-45-SB-109	SB-109	MIP	Evaluate westward extent of contamination, potential source area
PAI-45-SB-110	SB-110	MIP	Evaluate westward extent of contamination, potential source area
PAI-45-SB-111	SB-111	MIP	Evaluate westward extent of contamination, potential source area
PAI-45-SB-112	SB-112	MIP	Evaluate southern extent of contamination, potential source area
PAI-45-SB-113	SB-113	MIP	Evaluate southern extent of contamination, potential source area
PAI-45-SB-114	SB-114	MIP	Evaluate southern extent of contamination
PAI-45-SB-115	SB-115	MIP	Evaluate southern extent of contamination
PAI-45-SB-116	SB-116	MIP	Evaluate southern extent of contamination
PAI-45-SB-117	SB-117	MIP	Evaluate southern extent of contamination, potential source area
PAI-45-SB-118	SB-118	MIP	Evaluate southern extent of contamination, potential source area
PAI-45-SB-119	SB-119	MIP	Evaluate southern extent of contamination
PAI-45-SB-120	SB-120	MIP	Evaluate southern extent of contamination
PAI-45-SB-121	SB-121	MIP	Evaluate southern extent of contamination
PAI-45-SB-122	SB-122	MIP	Evaluate southern extent of contamination, potential source area
PAI-45-SB-123	SB-123	MIP	Evaluate southern extent of contamination
PAI-45-SB-124	SB-124	MIP	Evaluate southern extent of contamination
PAI-45-SB-125	SB-125	MIP	Evaluate southern extent of contamination
PAI-45-SB-126	SB-126	MIP	Evaluate southern extent of contamination, potential source area
PAI-45-SB-127	SB-127	MIP	Evaluate southern extent of contamination, potential source area
PAI-45-SB-128	SB-128	MIP	Evaluate southern extent of contamination
PAI-45-SB-129	SB-129	MIP	Evaluate southern extent of contamination
PAI-45-SB-130	SB-130	MIP	Evaluate southern extent of contamination
PAI-45-SB-131	SB-131	MIP	Evaluate southern extent of contamination

TABLE 4-3

SAMPLE SUMMARY
RI/RFI ADDENDUM WORK PLAN
MCRD PARRIS ISLAND, SOUTH CAROLINA

Sample Number or Boring Number	Location/ Matrix	Analyses	Location/depth Rationale
PAI-45-SB-132	SB-132	MIP	Evaluate southern extent of contamination
PAI-45-SB-133	SB-133	MIP	Evaluate southern extent of contamination
PAI-45-SB-134	SB-134	MIP	Evaluate extent of contamination north of MW04 cluster
PAI-45-SB-135	SB-135	MIP	Evaluate extent of contamination north of MW04 cluster
PAI-45-SB-136	SB-136	MIP	Evaluate extent of contamination south of MW04 cluster
PAI-45-SB-137	SB-137	MIP	Evaluate extent of contamination south of MW04 cluster
PAI-45-SB-138	SB-138	MIP	Evaluate extent of contamination south of MW04 cluster
PAI-45-SB-139	SB-139	MIP	Evaluate extent of contamination south of MW04 cluster
PAI-45-SB-140	SB-140	MIP	Evaluate downgradient-most edge of plume
PAI-45-SB-141	SB-141	MIP	Evaluate downgradient-most edge of plume
PAI-45-SB-142	SB-142	MIP	Evaluate downgradient-most edge of plume
PAI-45-SB-143	SB-143	MIP	Evaluate downgradient-most edge of plume
PAI-45-SB-144	SB-144	MIP	Evaluate downgradient-most edge of plume
PAI-45-SB-145	SB-145	MIP	Evaluate eastern extent of plume
PAI-45-SB-146	SB-146	MIP	Evaluate eastern extent of plume
PAI-45-SB-147	SB-147	MIP	Evaluate eastern extent of plume
PAI-45-SB-148	SB-148	MIP	Evaluate eastern extent of plume
PAI-45-SB-149	SB-149	MIP	Evaluate eastern extent of plume
PAI-45-SB-150	SB-150	MIP	Evaluate eastern extent of plume
PAI-45-SB-151	SB-151	MIP	Evaluate former tank area
PAI-45-SB-152	SB-152	MIP	Evaluate former tank area
PAI-45-SB-153	SB-153	MIP	Evaluate former tank area
PAI-45-SB-154	SB-154	MIP	Evaluate former tank area
PAI-45-SB-155	SB-155	MIP	Evaluate former tank area
PAI-45-SB-156	SB-156	MIP	Evaluate former loading dock
PAI-45-SB-157	SB-157	MIP	Evaluate former loading dock
PAI-45-SB-158	SB-158	MIP	Evaluate former loading dock

TABLE 4-3

SAMPLE SUMMARY
RI/RFI ADDENDUM WORK PLAN
MCRD PARRIS ISLAND, SOUTH CAROLINA

Sample Number	Location/ Matrix	Analyses	Location/depth Rationale
Groundwater, Temporary Wells			
PAI-45-TW-108-*SU*[2,3]	TW-108-SU	V	Western extent of plume, uncontaminated
PAI-45-TW-108-*SL*[2,3]	TW-108-SL	V	Western extent of plume, uncontaminated
PAI-45-TW-109-*SU*[2,3]	TW-109-SU	V	Western extent of plume, contaminated
PAI-45-TW-109-*SL*[2,3]	TW-109-SL	V	Western extent of plume, contaminated
PAI-45-TW-107-*SU*[2,3]	TW-107-SU	V	Eastern extent of plume, uncontaminated; consider results at SB-106, SB-107, and SB-117
PAI-45-TW-107-*SL*[2,3]	TW-107-SL	V	Eastern extent of plume, uncontaminated; consider results at SB-106, SB-107, and SB-117
PAI-45-TW-118-*SU*[2,3]	TW-118-SU	V	Western extent of plume, contaminated
PAI-45-TW-118-*SL*[2,3]	TW-118-SL	V	Western extent of plume, contaminated
PAI-45-TW-146-*SU*[2,3]	TW-146-SU	V	Eastern extent of plume, uncontaminated; consider results at SB-145, SB-146, and SB-147
PAI-45-TW-146-*SL*[2,3]	TW-146-SL	V	Eastern extent of plume, uncontaminated; consider results at SB-145, SB-146, and SB-147
PAI-45-TW-148-*SL*[2,3]	TW-148-SL	V	Downgradient extent of contamination, between MW05 cluster and TW34; consider results at SB-147, SB-148, and SB-149
PAI-45-TW-134-*SU*[2,3]	TW-134-SU	V	Western extent of plume, uncontaminated; consider results at SB-134, SB-137, and SB-140
PAI-45-TW-134-*SL*[2,3]	TW-134-SL	V	Western extent of plume, uncontaminated; consider results at SB-134, SB-137, and SB-140
PAI-45-TW-138-*SU*[2,3]	TW-138-SU	V	Downgradient of MW04 contamination, uncontaminated
PAI-45-TW-138-*SL*[2,3]	TW-138-SL	V	Downgradient of MW04 contamination, uncontaminated

TABLE 4-3

SAMPLE SUMMARY
RI/RFI ADDENDUM WORK PLAN
MCRD PARRIS ISLAND, SOUTH CAROLINA

Sample Number	Location/ Matrix	Analyses	Location/depth Rationale
Groundwater, Permanent Wells (New wells)			
PAI-45-GW-13SU-02	MW-13-SU	V	Immediately downgradient of source area
PAI-45-GW-13SL-02	MW-13-SL	V	Immediately downgradient of source area
PAI-45-GW-13D-02	MW-13-D	V	Immediately downgradient of source area, extent of deep contamination
PAI-45-GW-14SU-02	MW-14-SU	V	Side gradient, east; consider results at SB-106, SB-107, and SB-117
PAI-45-GW-14SL-02	MW-14-SL	V	Side gradient, east; consider results at SB-106, SB-107, and SB-117
PAI-45-GW-15SU-02	MW-15-SU	V	Side gradient, east; consider results at SB-145, SB-146, and SB-147
PAI-45-GW-15SL-02	MW-15-SL	V	Side gradient, east; consider results at SB-145, SB-146, and SB-147
PAI-45-GW-16SU-02	MW-16-SU	V	Indoor air modeling data
PAI-45-GW-16SL-02	MW-16-SL	V	Indoor air modeling data
PAI-45-GW-17SU-02	MW-17-SU	V	Downgradient edge of plume
PAI-45-GW-17SL-02	MW-17-SL	V	Downgradient edge of plume
PAI-45-GW-18SU-02	MW-18-SU	V	Indoor air modeling data
PAI-45-GW-18SL-02	MW-18-SL	V	Indoor air modeling data
PAI-45-GW-19SU-02	MW-19-SU	V	Side gradient, west; consider results at SB-134, SB-137, and SB-140
PAI-45-GW-19SL-02	MW-19-SL	V	Side gradient, west; consider results at SB-134, SB-137, and SB-140
PAI-45-GW-20SU-02	MW-20-SU	V	Downgradient of MW-04 cluster
PAI-45-GW-20SL-02	MW-20-SL	V	Downgradient of MW-04 cluster
PAI-45-GW-21SU-02	MW-21-SU	V	Side gradient, west
PAI-45-GW-21SL-02	MW-21-SL	V	Side gradient, west
PAI-45-GW-21D-02	MW-21-D	V	Side gradient, west, extent of deep contamination
PAI-45-GW-22SU-02	MW-22-SU	V	Side gradient, west
PAI-45-GW-22SL-02	MW-22-SL	V	Side gradient, west
PAI-45-GW-23SU-02	MW-23-SU	V	Downgradient changes in concentration/ consider results at SB-147, SB-148, and SB-149
PAI-45-GW-23SL-02	MW-23-SL	V	Downgradient changes in concentration/ consider results at SB-147, SB-148, and SB-149
PAI-45-GW-10SU-02	MW-10-SU	V	Extent of plume, side gradient, west
PAI-45-GW-10SL-02	MW-10-SL	V	Extent of plume, side gradient, west
PAI-45-GW-01D-02	MW-01-D	V	Upgradient, deep
PAI-45-GW-07D-02	MW-07-D	V	Extent of deep contamination
PAI-45-GW-06D-02	MW-06-D	V	Extent of deep contamination

TABLE 4-3

SAMPLE SUMMARY
RI/RFI ADDENDUM WORK PLAN
MCRD PARRIS ISLAND, SOUTH CAROLINA

Sample Number	Location/ Matrix	Analyses	Location/depth Rationale
Groundwater Permanent wells (Existing wells)			
PAI-45-GW-AMW2-02	AMW-2	V	Evaluate changes in extent of contamination, source area
PAI-45-GW-AMW5-02	AMW-5	V	Evaluate changes in extent of contamination, source area
PAI-45-GW-03SU-02	MW-03-SU	V	Evaluate changes in extent of contamination, high conc. below
PAI-45-GW-03SL-02	MW-03-SL	V	Evaluate changes in extent of contamination, conc. Increased with time
PAI-45-GW-04SU-02	MW-04-SU	V	Evaluate changes in extent of contamination, high conc. below
PAI-45-GW-04SL-02	MW-04-SL	V	Evaluate changes in extent of contamination, conc. Increased with time
PAI-45-GW-04D-02	MW-04-D	V	Evaluate changes in extent of contamination, high conc. above
PAI-45-GW-05SL-02	MW-05-SL	V	Evaluate changes in extent of contamination, confirm decrease in conc.
PAI-45-GW-06SU-02	MW-06-SU	V	Evaluate changes in extent of contamination, confirm decrease in conc.
PAI-45-GW-06SL-02	MW-06-SL	V	Evaluate changes in extent of contamination, variable conc. with time
PAI-45-GW-07SU-02	MW-07-SU	V	Evaluate changes in extent of contamination, confirm decrease with time
PAI-45-GW-07SL-02	MW-07-SL	V	Evaluate changes in extent of contamination, source area
PAI-45-GW-08SU-02	MW-08-SU	V	Evaluate changes in extent of contamination, source area
PAI-45-GW-08SL-02	MW-08-SL	V	Evaluate changes in extent of contamination, source area
PAI-45-GW-09D-02	MW-09-D	V	Evaluate changes in extent of contamination, downgradient, along axis

TABLE 4-3

SAMPLE SUMMARY
RI/RFI ADDENDUM WORK PLAN
MCRD PARRIS ISLAND, SOUTH CAROLINA

Sample Number	Location/ Matrix	Analyses	Location/depth Rationale
QA/QC			
PAI-45-FB-mmddyy-Y (1)		V	Field blank
PAI-45-TB-mmddyy-Y (1)		V	Trip blank
PAI-45-RB-mmddyy-Y (1)		V	Rinsate blank
PAI-45-WB-mmddyy-Y (1)		V	Source water
PAI-45-DU-mmddyy-Y (1)		V	Field duplicates
Other			
See Table 7-1 (Peat Samples)	See Table 7-1	NA	Peat samples; thick, low contamination locations to be selected.
PAI-45-IDW-mmddyy-Y (1)	Solid	C, TCLPV	Investigation-derived waste, soil cuttings from wells
PAI-45-IDW-mmddyy-Y (1)	Aqueous	V, S, I	Investigation-derived waste, decontamination water, development water, purge water

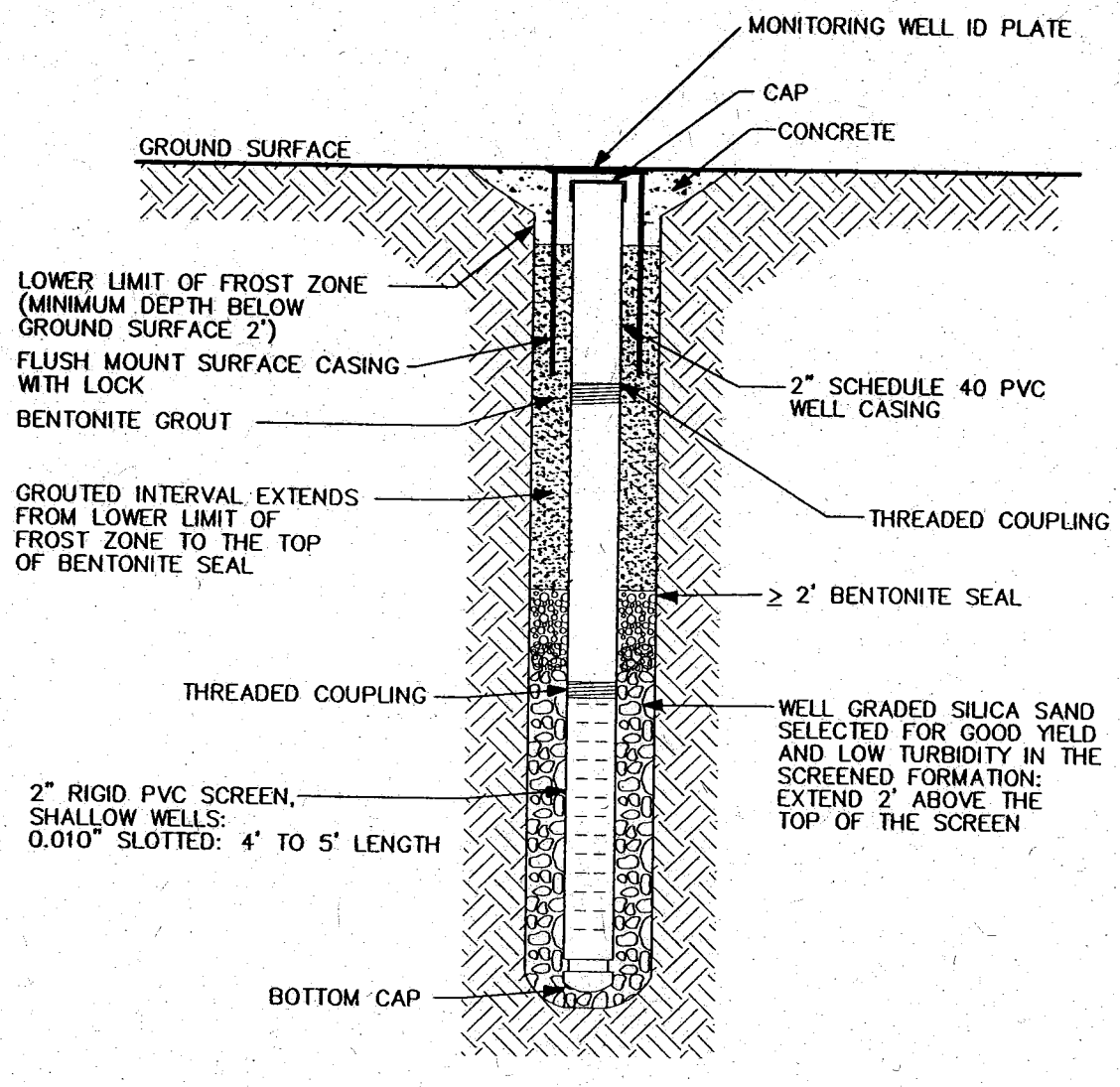
TABLE 4-3

SAMPLE SUMMARY
RI/RFI ADDENDUM WORK PLAN
MCRD PARRIS ISLAND, SOUTH CAROLINA

Notes:
1 – Refer to nomenclature section.
2 - SU and SL in sample numbers are to be replaced by sample depth at time of sampling.
3 - TW number is based on nearest SB. If locations of TWs are changed in the field, sample number must be revised.

V – Volatile organic compounds
S – Semivolatile organic compounds
I – Inorganics
C – Corrosivity
TCLP – TCLPV with analysis for volatile organic compounds toxicity characteristic constituents on leachate.

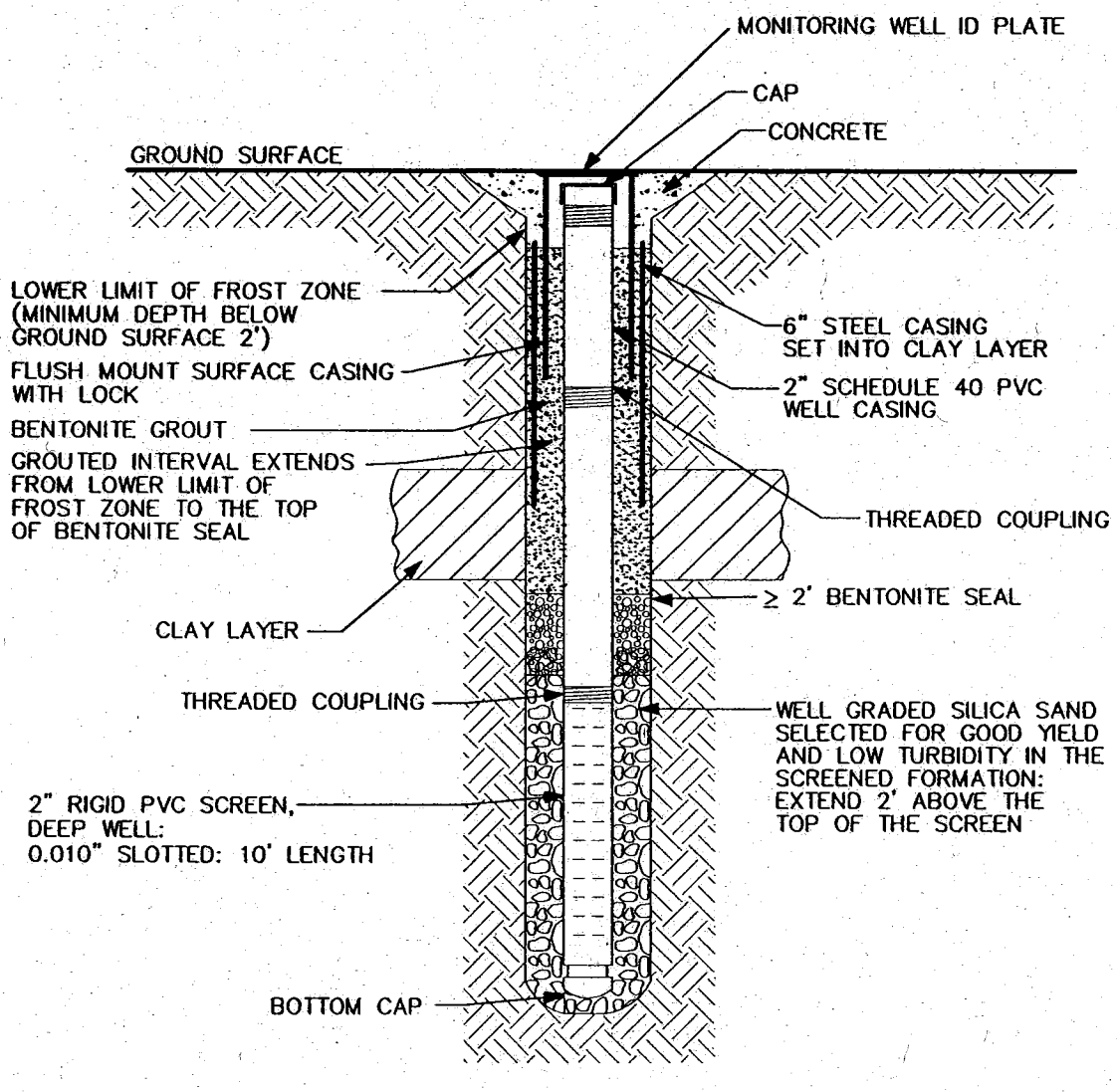
ACAD: 5260D03.dwg 12/08/04 DM PIT



DRAWN BY DM	DATE 12/8/04	TYPICAL AT-GRADE SHALLOW SURFICIAL AQUIFER MONITORING WELL DETAIL MRCD PARRIS ISLAND, SOUTH CAROLINA	CONTRACT NO. 5260
CHECKED BY	DATE		OWNER NO. 0000
REVISED BY	DATE		APPROVED BY / DATE
SCALE AS NOTED	NAVFAC		DRAWING NO. FIGURE 6-1 / REV. 0

FORM CADD NO. SDIV-AV.DWG - REV 1 - 9/10/98

ACAD: 5260CD04.dwg 12/08/04 DM PIT



DRAWN BY DM	DATE 12/8/04	TYPICAL AT-GRADE DEEP SURFICIAL AQUIFER MONITORING WELL DETAIL MRCD PARRIS ISLAND, SOUTH CAROLINA	CONTRACT NO. 5260
CHECKED BY	DATE		OWNER NO. 0000
REVISED BY	DATE		APPROVED BY / DATE
SCALE AS NOTED		NAVFAC	DRAWING NO. FIGURE 6-2 / REV. 0

FORM CADD NO. SDIV-AV.DWG - REV 1 - 9/10/98