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MCRD PARRIS ISLAND
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LETTER REGARDING U S NAVY REQUEST FOR WELL PERMIT FOR REMEDIAL
INVESTIGATION WORK PLAN ADDENDUM FOR SITE 27 EQUIPMENT PARADE DECK
WITH ATTACHMENTS MCRD PARRIS ISLAND SC
7/21/2008
TETRA TECH NUS



TETRA TECH

PITT-07-8-032

July 21, 2008

Project Number 112G00455

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

ATTN: Sommer Barker

Reference: CLEAN Contact No. N62467-04-D-0055
Contract Task Order No. 0039

Subject: Well Permit Request for RI Work Plan Addendum
Site 27 (Equipment Parade Deck)
Marine Corps Recruit Depot (MCRD) Parris Island, South Carolina

Dear Ms. Barker:

On the behalf of the Navy and MCRD, Tetra Tech NUS, Inc. is submitting this request for well permit at Site 27 (Equipment Parade Deck). Approvals should be coordinated directly with Tim Harrington of MCRD Parris Island. The specific field work tasks are described in the RI Work Plan Addendum (TtNUS, July 2008). The workplan was updated based on SCDHEC and EPA comments to a prior draft. Field work is scheduled to begin on Monday, August 4 with permanent well installation and sampling. The attached table 3-1 and Figure 2-2 provide details from the workplan.

New permanent monitoring wells (identified on the figure with yellow highlights, and identified on Table 3-1 will be drilled by hollow-stem auger. New shallow monitoring wells will be screened across the water table, which is expected to include the 8- to 12-foot bgs interval. Screen lengths and/or depth intervals may be field adjusted to ensure the screened intervals straddle the water table. The intermediate monitoring wells will be screened immediately above the clay unit previously encountered at approximately 24-25 feet bgs. The top of the clay unit will be determined by visually describing changes in lithology observed in split-spoon samples collected during drilling operations. Once the clay unit is encountered, a few continuous split-spoon samples will be taken to confirm the thickness of the clay unit. 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.

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.

Tetra Tech NUS, Inc.

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TETRA TECH

Ms. Sommer Barker
Department of Health & Environmental
Control (DHEC)/BLWM
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Wells will be installed as stick-ups or flush-mounts. Stick-up construction will be used except where traffic could be impeded. 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 Level A or Level B certified driller(s) will drill and install 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.

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: Charles Cook, NAVFAC (1 letter)
Heber Pittman, MCRD Parris Island (1 letter)
Meredith Amick, SCDHEC (1 letter)
Charlie Warino, TtNUS (1 letter)
D. Humbert (cover letter only)
M. Perry/File 0455, CTO 0039

TABLE 3-1

PROPOSED SAMPLING - SITE 27 REMEDIAL INVESTIGATION WORK PLAN ADDENDUM
MCRD PARRIS ISLAND
PARRIS ISLAND, SOUTH CAROLINA
PAGE 1 OF 3

LOCATIONS TO BE SAMPLED	DEPTHS TO BE SAMPLED	RATIONALE
GROUNDWATER		
PAI-27-MW-6 PI055MW07I PI055MW08D	shallow intermediate deep	Confirm high concentrations of pesticides. These three wells are located in a cluster near the Fiber Optic Vault where groundwater contamination was first noted. The highest pesticide concentrations were detected in a sample collected from PAI-27-MW-6. The next highest pesticide concentrations were detected in the sample from PI055MW07I. Samples from the intermediate and deep wells at this location will help to define the vertical extent of contamination. In addition, high concentrations of chlorobenzene were detected in groundwater samples collected from abandoned wells (PAI-55-FDP20, PAI-27-TW-25I, and PAI-55-FDP12) located in this area.
PI055MW11 PI055MW12I PI055MW13D	shallow intermediate deep	Confirm elevated concentrations of pesticides. These three wells are located in a cluster about 100 feet northeast of the Fiber Optic Vault. Elevated concentrations of pesticides (d-BHC at 47 µg/L) were detected in PI055MW11. In addition, elevated concentrations of chlorobenzene were detected in PI055MW12I, PAI-27-TW-26S (abandoned), and PAI-55-FDP04 (abandoned) in this area. Samples from the intermediate and deep wells at this location will help to define the vertical extent of contamination.
PI027MW19	shallow	Confirm elevated concentrations of pesticides (a-BHC at 46 µg/L) and chlorobenzene (479 µg/L). In addition, this well is located near a cluster of three abandoned wells (PAI-27-TW-30S, PAI-27-TW-31I, and PAI-27-TW-45D) that also had elevated detections of pesticides and chlorobenzene.
PI055MW17 PI055MW18I	shallow intermediate	These wells are close to where PAI-27-TW-28S and PAI-27-TW-29I were located. Elevated concentration of d-BHC (32 µg/L) was detected in PAI-27-TW-28S. These wells had low concentrations of VOCs and could also be used to define the horizontal and vertical extent of the VOC contamination.
PAI-27-MW-14 PAI-27-MW-15I	shallow intermediate	A somewhat elevated concentration of d-BHC (6.1 µg/L) was detected in PAI-27-MW14 and an elevated concentration of chlorobenzene (690 µg/L) was detected in PAI-27-MW-15I. Samples would be used to define the horizontal and vertical extent of groundwater contamination. These wells are also within 30 feet of abandoned well PAI-55-FDP05 (2,830 µg/L of chlorobenzene).
PAI-27-MW-16	shallow	Low concentrations of pesticides (d-BHC - 1.2 µg/L) were detected in PAI-27-MW16. Sample would be used to define the horizontal and vertical extent of groundwater contamination.
PI055MW01 PAI-27-MW-2I	shallow intermediate	A somewhat elevated concentration of d-BHC (2.3 µg/L) was detected in PI055MW01 and low concentrations of VOCs were detected in these wells. The samples would be used to define the extent of contamination.
PI027MW21	shallow	A somewhat elevated concentration of a-BHC (2.9 µg/L) was detected in PI027MW21 and low concentrations of VOCs were detected in this well. The sample would be used to define the horizontal and vertical extent of contamination.

TABLE 3-1

PROPOSED SAMPLING - SITE 27 REMEDIAL INVESTIGATION WORK PLAN ADDENDUM
MCRD PARRIS ISLAND
PARRIS ISLAND, SOUTH CAROLINA
PAGE 2 OF 3

LOCATIONS TO BE SAMPLED	DEPTHS TO BE SAMPLED	RATIONALE
GROUNDWATER		
PAI-27-MW-9 PAI-27-MW48I	shallow intermediate (new)	Pesticides and VOCs were not detected in PAI-27-MW-9. This well would be sampled to confirm the nature and extent of contamination. The new intermediate well would be sampled to confirm the vertical extent of contamination upgradient of the wells with the highest concentrations.
PAI-27-MW-4 PAI-27-MW-5I	shallow intermediate	Low concentrations of VOCs and no pesticides were detected in these wells. These wells are located near PAI-55-FDP14 (960 µg/L - chlorobenzene) and can be used to confirm the horizontal and vertical extent of contamination.
PI055MW10 PI027MW20	shallow shallow	Low concentrations of VOCs and pesticides were detected in these wells. The samples would be used to confirm the horizontal and vertical extent of contamination.
PAI-27MW49S PAI-27MW50I	shallow (new) intermediate (new)	This well would replace PAI-55-FDP07 (chlorobenzene - 590 ug/L). In addition to confirming presence of VOCs, the samples could also be used to define the horizontal and vertical extent of pesticide contamination (no wells in this area sampled for pesticides).
PAI-27MW51S PAI-27MW52I	shallow (new) intermediate (new)	These are new wells that will be used to define the vertical and horizontal extent of contamination upgradient of the wells with the highest concentrations.
PAI-27MW53S PAI-27MW54I	shallow (new) intermediate (new)	These are new wells that will be used to define the horizontal and vertical extent of contamination south west of the wells with the highest concentrations.
PAI-27MW55S PAI-27MW56I	shallow (new) intermediate (new)	These are new wells that will be used to define the horizontal and vertical extent of contamination west of the contaminated area.
PAI-27MW57S	shallow (new)	This well will be used to define the horizontal and vertical extent of contamination north of the contaminated area.
PAI-27MW58S PAI-27MW59I	shallow (new) intermediate (new)	These are new wells that will be used to define the horizontal and vertical extent of contamination north of the contaminated area.
PAI-27MW60I	intermediate (new)	This well will be used to define the horizontal and vertical extent of contamination north of the contaminated area.
PAI-27MW61I	intermediate (new)	This well will be used to define the horizontal and vertical extent of contamination north of the contaminated area.
PAI-27MW62S	shallow (new)	This well will be used to confirm concentrations downgradient of PI027MW21.
PAI-27MW63S	shallow (new)	This well will be used to confirm concentrations in the vicinity of PAI-27-TW-39S (downgradient of PAI-27-MW16).
PAI-27MW64S	shallow (new)	This well will be used to determine the upgradient extent of VOC contamination (downgradient of Building 405).

TABLE 3-1

**PROPOSED SAMPLING - SITE 27 REMEDIAL INVESTIGATION WORK PLAN ADDENDUM
MCRD PARRIS ISLAND
PARRIS ISLAND, SOUTH CAROLINA
PAGE 3 OF 3**

LOCATIONS TO BE SAMPLED	DEPTHS TO BE SAMPLED	RATIONALE
SOIL		
PAI-27-SB014 through PAI-27-SB019 (6 locations)		One surface and one subsurface sample at each location. Six borings will be advanced around well cluster PAI-27-MW-6, PI055MW07I, and PI055MW08D to determine if soil in this area is contaminated with pesticides (potential source area).
PAI-27-SB020 through PAI-27-SB025 (6 locations)		One surface and one subsurface sample at each location. Six borings would be advanced around well cluster PI055MW11, PI055MW12I, and PI055MW13D to determine if soil in this area is contaminated with VOC (potential source area).
PAI-27-SB026		One surface and one subsurface sample at this location to determine is soil contamination exists near PAI-55-FDP05.
PAI-27-SB027		One surface and one subsurface sample at this location to determine is soil contamination exists near PAI-55-FDP02.
PAI-27-SB028		One surface and one subsurface sample at this location to determine is soil contamination exists near PAI-55-FDP22.
PAI-27-SB029		One surface and one subsurface sample at this location to determine is soil contamination exists near PAI027MW19.

Objectives of proposed groundwater sampling:

1. Confirm detections of high concentrations of pesticides and VOCs (chlorobenzene) in groundwater
2. Establish a better understanding of nature and extent of pesticide and VOC (chlorobenzene) contamination in groundwater

Objectives of proposed soil sampling:

1. Collect soil samples in areas of highest groundwater concentrations to determine if source of groundwater contamination is present in the soil
2. Collect soil samples downgradient of the potential source areas to confirm that soil in the area is not contaminated with pesticides/VOCs.

Notes:

1. Groundwater samples will be analyzed for VOCs, pesticides, TDS, TOC, and total alkalinity. Field parameters include DO, temperature, salinity, specific conductance, turbidity, pH, and ORP.
2. Soil samples will be analyzed for VOCs, pesticides, TOC, and pH.
3. Subsurface soil sample at each location will be collected from the depth interval that exhibits the most likelihood of contamination (visual observations, PID readings, etc.).



PAI-27-TW-26S	
4,4'-DDD	5.5 [H]
4,4'-DDT	2.7 [H]
BETA-BHC	2.7 [H]
DELTA-BHC	27 [H]

PAI-27-TW-27I	
4,4'-DDD	0.43 [H]
4,4'-DDT	0.28 [H]
BETA-BHC	0.096 [H]
DELTA-BHC	0.6 [H]

PAI-27-MW-15I	
DELTA-BHC	0.72 [H]

PAI-27-MW-14	
4,4'-DDD	2.7 [H]
4,4'-DDT	0.91 [H]
ALPHA-BHC	0.74 [H]
BETA-BHC	1.4 [H]
DELTA-BHC	6.1 [H]
GAMMA-BHC (LINDANE)	0.32 [H]

PAI-27-TW-39S	
ND	
PAI-27-TW-40I	
4,4'-DDD	0.55 J [H]
4,4'-DDT	0.25 J [H]
ALPHA-BHC	0.085 J [H]
DELTA-BHC	0.11 J [H]
GAMMA-BHC (LINDANE)	0.086 J [H]

PAI-27-TW-32I	
ALPHA-BHC	0.064 J [H]
DELTA-BHC	0.11 [H]

PAI-27-TW-42I	
ND	
PAI-27-TW-41S	
ALPHA-BHC	4.9 [H]
DELTA-BHC	4.5 [H]
GAMMA-BHC (LINDANE)	4.2 [H]

PAI-27-MW-16	
ALPHA-BHC	0.52 [H]
BETA-BHC	0.23 [H]
DELTA-BHC	1.2 [H]
GAMMA-BHC (LINDANE)	0.19 [H]

PAI-27-TW-30S	
ALPHA-BHC	46 [H]
BETA-BHC	8.6 [H]
DELTA-BHC	88 [H]
GAMMA-BHC (LINDANE)	19 [H]
PAI-27-TW-45D	
ND	

PI055MW13D	
4,4'-DDD	0.064 J
4,4'-DDT	0.08 J
ALPHA-BHC	0.023 J [H]
BETA-BHC	0.042 J [H]
DELTA-BHC	0.14 [H]
GAMMA-BHC (LINDANE)	0.019 J

PI027MW21	
4,4'-DDT	0.21 J [H]
ALPHA-BHC	2.9 [H]
DELTA-BHC	0.43 [H]

PI055MW11	
4,4'-DDT	3.3 J [H]
ALPHA-BHC	2.9 J [H]
BETA-BHC	16 J [H]
DELTA-BHC	47 J [H]
PI055MW12I	
ND	

PI027MW19	
ALPHA-BHC	46 J [H]
BETA-BHC	4.1 J [H]
DELTA-BHC	41 J [H]
GAMMA-BHC (LINDANE)	27 J [H]

PAI-27-TW-31I	
ALPHA-BHC	0.6 J [H]
BETA-BHC	0.075 [H]
DELTA-BHC	0.88 [H]
GAMMA-BHC (LINDANE)	0.11 [H]

PAI-27-TW-35S	
ND	

PI027MW20	
4,4'-DDD	0.039 J
4,4'-DDE	0.024 J
4,4'-DDT	0.058 J
ALPHA-BHC	0.25 [H]

PAI-27-TW-36I	
ND	

PAI-27-TW-38I	
ND	
PAI-27-TW-37S	
HEPTACHLOR EPOXIDE	0.35 J [H]

PAI-27-TW-43S	
ALPHA-BHC	11 [H]
BETA-BHC	0.81 [H]
DELTA-BHC	11 [H]
GAMMA-BHC (LINDANE)	2.4 [H]
PAI-27-TW-44I	
ALPHA-BHC	0.24 [H]
DELTA-BHC	0.26 [H]
GAMMA-BHC (LINDANE)	0.11 [H]

PAI-27-TW-33S	
ND	
PAI-27-TW-34I	
ND	

PAI-27-MW-4	
4,4'-DDD	0.95 [H]
BETA-BHC	0.07 [H]
DELTA-BHC	0.31 [H]

PAI-27-TW-28S	
ALPHA-BHC	17 [H]
BETA-BHC	3 [H]
DELTA-BHC	32 [H]
GAMMA-BHC (LINDANE)	21 [H]
PAI-27-TW-29I	
ALPHA-BHC	0.33 [H]
BETA-BHC	0.06 [H]
DELTA-BHC	0.43 [H]
GAMMA-BHC (LINDANE)	0.12 [H]

PAI-27-MW-6	
4,4'-DDD	3400 [H]
4,4'-DDT	1600 [H]
ALPHA-BHC	470 [H]
BETA-BHC	130 [H]
DELTA-BHC	700 [H]
GAMMA-BHC (LINDANE)	540 [H]

PI055MW18I	
4,4'-DDT	0.058 J
ALPHA-BHC	0.094 J [H]
DELTA-BHC	0.039 J [H]

PAI-27-TW-24S	
4,4'-DDD	0.052 J
ALPHA-BHC	0.064 [H]
BETA-BHC	0.37 [H]
DELTA-BHC	0.69 [H]
PAI-27-TW-24S (DUP)	
4,4'-DDD	0.052 J
ALPHA-BHC	0.076 [H]
BETA-BHC	0.41 [H]
DELTA-BHC	0.76 [H]

PI055MW10	
4,4'-DDD	0.017 J
4,4'-DDT	0.059 J
ALPHA-BHC	0.26 [H]
BETA-BHC	0.019 J
DELTA-BHC	0.25 [H]

PAI-27-MW-2I	
4,4'-DDD	0.062 J
PI055MW01	
4,4'-DDD	0.074 J
4,4'-DDT	0.22 J [H]
ALPHA-BHC	0.33 [H]
BETA-BHC	1.2 [H]
DELTA-BHC	2.3 J [H]

PI055MW07I	
4,4'-DDD	7.1 [H]
4,4'-DDT	0.82 [H]
ALPHA-BHC	1 [H]
BETA-BHC	0.23 J [H]
DELTA-BHC	2.5 [H]
GAMMA-BHC (LINDANE)	0.13 J [H]

PI055MW17	
4,4'-DDT	0.053 J
ALPHA-BHC	0.27 J [H]
BETA-BHC	0.043 J [H]
DELTA-BHC	0.41 J [H]
GAMMA-BHC (LINDANE)	0.21 J [H]

PAI-27-TW-46S	
4,4'-DDD	5.3 J [H]
4,4'-DDT	3.9 J [H]
BETA-BHC	7.8 [H]
DELTA-BHC	51 [H]
PAI-27-TW-47I	
4,4'-DDD	0.34 [H]
4,4'-DDT	0.4 [H]
ALPHA-BHC	0.065 [H]
BETA-BHC	0.15 [H]
DELTA-BHC	0.53 [H]

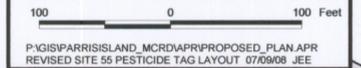
PAI-27-TW-25I	
4,4'-DDD	1.2 [H]
4,4'-DDT	2.8 [H]
ALPHA-BHC	4.7 [H]
BETA-BHC	1.6 [H]
DELTA-BHC	13 [H]
GAMMA-BHC (LINDANE)	2.2 [H]

PAI-27-TW-22S	
ALPHA-BHC	0.088 [H]
BETA-BHC	0.37 J [H]
DELTA-BHC	0.39 J [H]
GAMMA-BHC (LINDANE)	0.051 J
PAI-27-TW-23I	
4,4'-DDD	0.06 J
ALPHA-BHC	0.042 J [H]
BETA-BHC	0.15 J [H]
DELTA-BHC	0.16 J [H]

PI055MW08D	
4,4'-DDD	1.6 [H]
4,4'-DDT	0.58 [H]
ALPHA-BHC	3.1 [H]
BETA-BHC	0.55 [H]
DELTA-BHC	3.2 [H]
GAMMA-BHC (LINDANE)	0.44 [H]

LEGEND

- Groundwater Sample Location
- Existing Monitoring Well Location
- Proposed Monitoring Well Location
- H Reported Concentration Exceeds The Region 9 Tap Water PRG
- ug/L Micrograms per Liter
- Pesticide Concentration > 1 ug/L
- Pesticide Concentration > 10 ug/L
- Pesticide Concentration > 50 ug/L
- Tree Line
- Aerial Pipe
- Sidewalk
- Road
- Building
- Water
- Site Boundary



DRAWN BY	DATE
S. STROZ	03/05/08
CHECKED BY	DATE
G. ZIMMERMAN	07/09/08
REVISED BY	DATE
J. ENGLISH	07/09/08
SCALE	AS NOTED

PROPOSED SAMPLE LOCATIONS AND PESTICIDE CONCENTRATIONS (ug/L) IN GROUNDWATER
SITES 27/55
MCRD PARRIS ISLAND
PARRIS ISLAND, SOUTH CAROLINA

CONTRACT NO.	0455
OWNER NO.	
APPROVED BY	DATE
DRAWING NO.	REV.
FIGURE 2-2	0