

N61165.AR.004456
CNC CHARLESTON
5090.3a

U S NAVY RESPONSE TO SOUTH CAROLINA DEPARTMENT OF HEALTH AND
ENVIRONMENTAL CONTROL COMMENTS TO RCRA FACILITY INVESTIGATION REPORT
ADDENDUM SOLID WASTE MANAGEMENT UNIT 163 (SWMU 163) ZONE K WITH
TRANSMITTAL CNC CHARLESTON SC
9/30/2004
CH2M HILL

SWMU 163 Zone K
RTC RFI Report Addendum (RΦ)

CH2MHILL TRANSMITTAL

To: David Scaturo
South Carolina Department of Health
and Environmental Control
Bureau of Land and Waste
Management
8901 Farrow Road
Columbia, SC 29203

From: Dean Williamson/CH2M-Jones

Date: September 30, 2004

Re: CH2M-Jones' Responses to Comments by SCDHEC regarding the *RFI Report Addendum II, SWMU 163, Zone K, Revision 0*, originally submitted on June 17, 2004

We Are Sending You:

X	Attached	Under separate cover via	
	Shop Drawings	Documents	Tracings
	Prints	Specifications	Catalogs
	Copy of letter	Other:	

Quantity	Description
2	CH2M-Jones' Responses to Comments by SCDHEC regarding the <i>RFI Report Addendum II, SWMU 163, Zone K, Revision 0</i> , originally submitted on June 17, 2004

If material received is not as listed, please notify us at once.

Copy To:

Dann Spariosu/USEPA, w/att
Rob Harrell/Navy, w/att
Gary Foster/CH2M-Jones, w/att

This document presents CH2M-Jones' responses to specific comments made by the South Carolina Department of Health and Environmental Control (SCDHEC) based on its review of the RCRA Facility Investigation (RFI) Report Addendum II for SWMU 163, Zone K, Revision 0 (CH2M-Jones, June 2004).

Comments Prepared by Jerry Stamps (July 27, 2004)

1. Section 3.1.1.2

The Department understands that a UCL₉₅ for BEQ contamination was calculated during the SWMU 163 RFI Report Addendum, Revision I. This exposure point concentration was calculated to be 329 ppb, which exceeds the Zone K surface soil reference concentration of 86 ppb. The Navy must recalculate the exposure point concentration with the newly available data. Should the resulting concentration exceed the BEQ reference concentration, the Navy must present the risk associated with exposure to this contamination.

CH2M-Jones Response:

The Navy has recalculated the BEQ exposure point concentration using historical RFI data and recent data collected during the RFI Addendum activities. A total of 28 samples with 13 detects were included for the UCL₉₅ calculation. The recalculated BEQ exposure point concentration (EPC) is 300 µg/kg, which is lower than the previously estimated EPC value (see Attachment 1). This value is higher than the background BEQ value of 86 µg/kg as calculated in the Technical Memorandum Preliminary Results for Additional Background PAH Sampling from CNC Main Base Railroad Lines and Annex (Zone K), dated May 3, 2001. The majority of the BEQ value can be attributed to non-detects that were calculated at half the reporting limit (RL) value for non-detected concentrations.

The potential risk from exposure to site BEQs was estimated using the Preliminary Risk Evaluation (PRE) approach. Table 1 presents the potential risks to human receptors from the BEQs at SWMU 163. The risks were below 1 in 1 million to an onsite worker and were slightly above the 1 in 1 million level for a resident. However, these calculated concentrations are well within the EPA's acceptable risk range of 1 to 100 million.

TABLE 1
Potential Cancer Risks to Industrial and Residential Receptors from BEQs

	EPC (mg/kg)	RBC (mg/kg)		Risk	
		Residential	Industrial	Residential Risk	Industrial Risk
BEQ	0.3	0.087	0.78	3.4E-06	3.8E-07

2. Section 3.1.1.4, Line 24

This section must be revised to clarify that VOCs are initially screened against an SSL with a DAF of 1 rather than 10.

CH2M-Jones Response:

The Navy agrees with SCDHEC and will revise the RFI Report Addendum II to state that detected VOC concentrations were screened against an SSL with a DAF of 1.

3. Section 4.1

The Technical Memorandum entitled *Results from Additional Background Sampling of the CNC Railroad Lines and Naval Annex (Zone K)* indicates that BEQs are calculated using half of the reporting limit (RL) for non-detects as opposed to the MDL as stated in this section. Furthermore, if the MDL is truly 300 ppb, one would expect estimated detections of 49, 51, and 76 ppb of Benzo(a)Pyrene in surface soil to be non-detect rather than estimated quantities. This is true for the remainder of the PAHs as well. Consequently, the Navy must clarify if the 300 ppb is a RL or MDL. In the future, the Navy must make every effort to use RLs and/or MDLs that are consistent with those used in deriving the reference concentration.

CH2M-Jones Response:

The Navy did use half of the RL for non-detects in calculating the BEQ concentrations. In Section 4.1, the acronym MDL was inadvertently referenced in lieu of RL. The text will be revised to state that BEQs were calculated using half the RL for non-detects.

Comments Prepared by Don C. Hargrove (July 16, 2004)

1. Well Construction Diagrams:

- a) Type/slot size of screen: The term "dia." is inaccurate, and should be removed.

CH2M-Jones Response:

The Navy agrees with SCDHEC and has revised the well construction diagrams by deleting the "dia." text. The revised well construction diagrams for monitoring wells K166GW42D and K166GW43D are attached to these responses to comments (see Attachment 2).

- b) The use of bentonite pellets is preferred over the specified bentonite chips. The chips do not hydrate as quickly or completely as the pellets. Regardless of the type of bentonite used in the future, the hydration time for the bentonite should be specified in order to show adequate hydration of the seal prior to grout emplacement.

CH2M-Jones Response:

The Navy used 3/8-inch diameter bentonite pellets to seal each well (K166GW42D and K166GW43D). This reference is identified in Footnote 7 in the attached well construction diagrams (see Attachment 2).

- c) The water table should be presented graphically on these diagrams.

CH2M-Jones Response:

The Navy agrees with SCDHEC and has added the groundwater elevation in Footnote 10 to the attached well construction diagrams (see Attachment 2).

- d) R.71-71.H.1.f(5) specifies the inclusion of the Driller's or Geologist's log as part of the reporting requirements. These logs are not included in this document. If they have already been submitted under a separate cover, please reference that submittal in this document. If they have not been submitted yet, they should be included with the construction diagrams.

CH2M-Jones Response:

The Navy agrees with SCDHEC and has attached the well development and purging data for monitoring wells K166GW42D and K166GW43D (see Attachment 3).

2. The Navy should be made aware that when the analytical data for groundwater samples from these wells is present, they must also submit the post-construction development logs, as well as the pre-sampling logs. These logs are required to show that: a) the wells were constructed properly, and b) that the groundwater samples taken are truly representative of the aquifer in question.

CH2M-Jones Response:

The Navy agrees with SCDHEC and will make every effort to submit the requested information in a timely manner for each well installed at the Charleston Naval Complex.

3. It is expected that the chlorinated solvent groundwater contamination documented as migrating off-base to the south will be aggressively investigated. The Navy should currently be in the process of gaining access to this area, in order to install and sample monitoring wells to define the horizontal and vertical extent of contamination.

CH2M-Jones Response:

Navy agrees with SCDHEC. In the fall of 2003, the southwest portion of the Naval Annex was investigated as part of the RFI activities associated with SWMU 166. The BCT has previously agreed that once the SWMU 163 RFI is completed, all subsequent remediation activities associated with the dissolved chlorinated solvent plume at the Naval Annex would be completed as part of the SWMU 166 corrective measures study and corrective measures implementation process.

In October 2003, two groundwater monitoring wells were installed in the southwest corner of the Naval Annex to evaluate potential offsite migration. These two monitoring wells, identified as KGDKGW03D and KGDKGW04D, were sampled on November 18, 2003, for 1,1-dichloroethene, tetrachloroethene (PCE) and its reductive dechlorination byproducts trichloroethene (TCE), cis- and trans-1,2-dichloroethene, and vinyl chloride. TCE was detected at concentrations of 3.8J and 14.6 µg/L in samples collected from KGDKGW03D and KGDKGW04D, respectively. The detected concentration associated with KGDKGW04D exceeds its maximum contaminant level (MCL) of 5 µg/L. The locations of these wells with the detected TCE concentrations are presented on revised Figure 4-3, which presents TCE in the deeper zone of the aquifer. Cis-1,2-dichloroethene was also detected in the sample collected from KGDKGW04D at a concentration of 0.72J µg/L. Revised Figure 4-3 and Table 2, which summarizes the November 2003 sampling results, are attached with these responses to comments (Attachment 4). Attachment 4 also contains the well development and purging data for monitoring wells KGDKGW03D and KGDKGW04D.

The well construction diagrams and well development and purging data for monitoring wells KGDKGW03D and KGDKGW04D are included as Attachment 5. Bentonite chips were used as the seal in the construction of these deep wells, since hydrated chips require additional time to seal the annulus compared to pellets. This extra time allows the chips to travel vertically to the desired sand interval.

Even though TCE was detected above its MCL near the Annex boundary, the Navy does not believe additional investigation activities are its responsibility. The Navy and CH2M-Jones believe that the data produced by its RFIs at Zone K and by the Air Force for the area of concern (AOC) S investigation at the Charleston Air Force Base indicate that the contamination is from a source north of the Annex on the Charleston Air Force Base. Accordingly, the Navy and CH2M-Jones believe that any additional investigation activities to characterize the extent of contamination in the area of the southwest Annex boundary will not be the Navy's responsibility.

Attachment 1

BEQ UCL₉₅ Calculation

BEQ UCL₉₅ Calculation

Site: SWMU 163
Media: Surface Soil
Units: ug/kg
Chemical: BEQs
CASRN:

STATISTICS

N	28
Detects	13
FOD	46%
Mean of Detect	343.2
Min of Detect	233.7
Max of Detect	473.10
Best Estimate of Mean (arithmetic)	300.1
Best Estimate of Mean (geometric)	263.7
Nondetects at 1/2 DL	YES

95% UPPER CONFIDENCE LIMITS FOR MEAN

UCL95 Normal	301.2
<i>t</i> -statistic	1.70
UCL95 Lognormal	300.8
<i>H</i> -statistic	1.76
UCL95 Nonparametric	219.5
UCL95 Bootstrap	300.11

95% UPPER TOLERANCE INTERVAL

UTL95 Normal	419.42
<i>coverage</i>	95%
UTL95 Lognormal	425.26
<i>coverage</i>	95%
UTL95 Nonparametric	473.10
<i>coverage</i>	97%

DISTRIBUTION TESTING

Population is best described as:	NONPARAMETRIC
W_{normal}	0.781
W_{log}	0.814
$W_{\alpha = 0.05}$	0.924

Notes:

1. If population does not fit normal or lognormal distribution, check Q-Q plots and W-test values. The population may be close enough to one of those distributions to subjectively select a normal or lognormal distribution.
2. For site data, if the selected UCL95 exceeds the Max Detect, the Max Detect should be chosen as the EPC.
3. Lognormal UCL or UTL values calculated for less than 30 samples may be widely inflated.
4. If there is >90% nondetection, it is generally impossible to calculate a UTL or UCL with any level of confidence.

Attachment 2

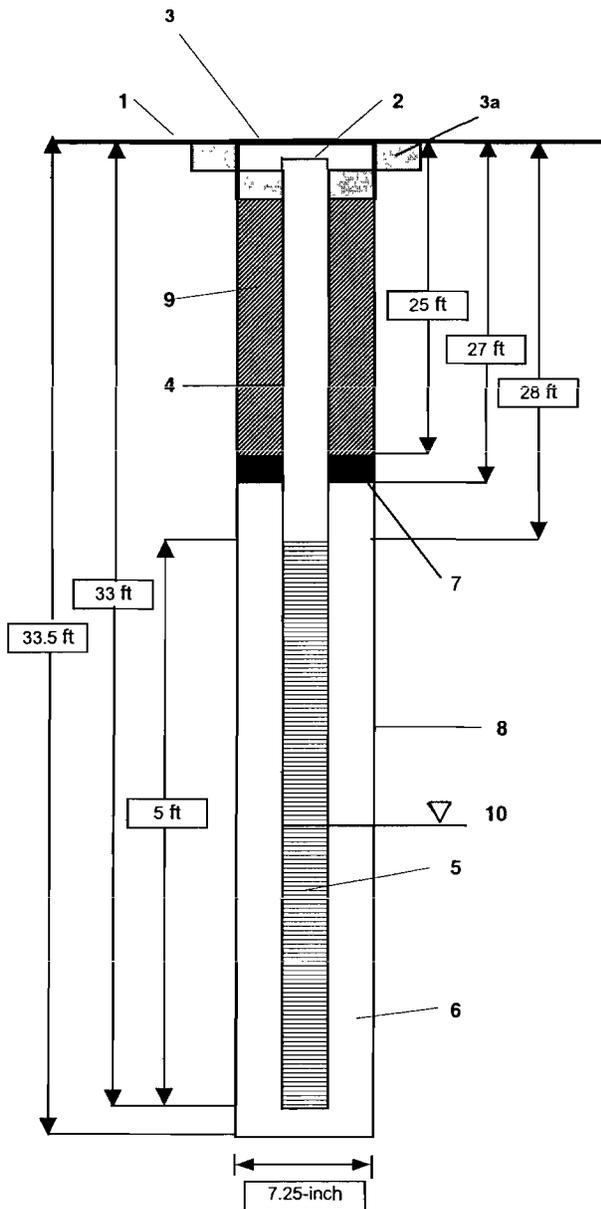
Monitoring Well Construction Diagrams K166GW42D and K166GW43D



PROJECT NUMBER 158814.ZK.EX.07	WELL NUMBER 166GW042D	SHEET 1 OF 1
-----------------------------------	--------------------------	--------------

WELL COMPLETION DIAGRAM

PROJECT : SWMU 166, Zone K, Charleston Naval Complex	LOCATION : Charleston, South Carolina
DRILLING CONTRACTOR : Prosonic Corporation License # 1435	NORTHING: 388154.7
DRILLING METHOD AND EQUIPMENT USED : Hollow stem augers (7 1/4-inch outside diameter)	EASTING: 2300362.2
WATER LEVELS : 31.60	START : 5/14/2002 END: 5/14/2002 LOGGER : David Beverly



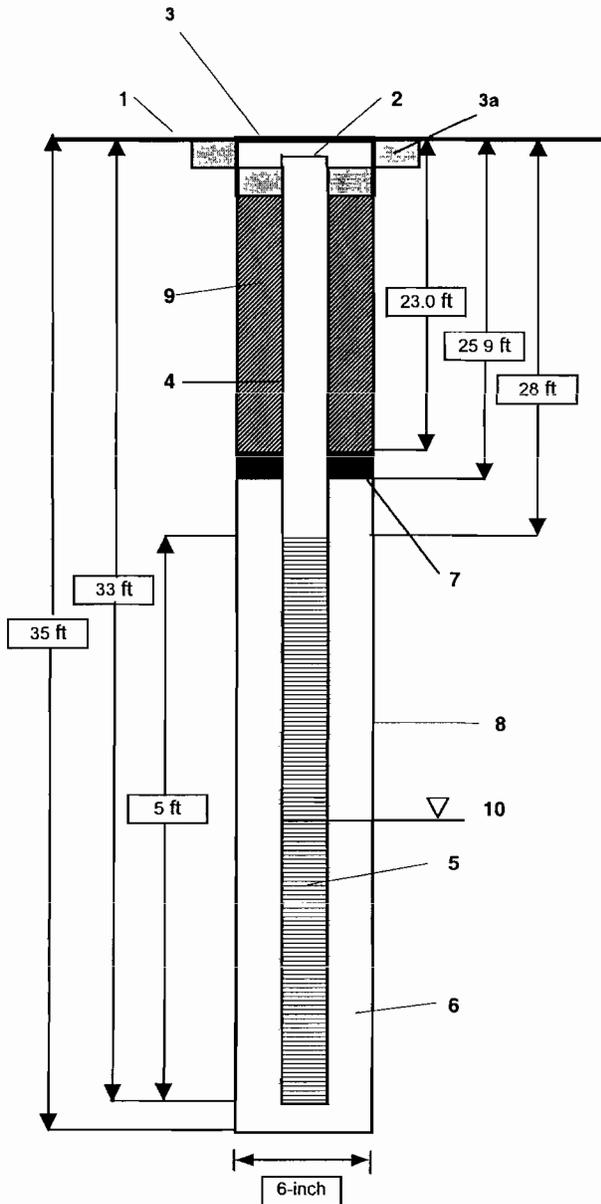
1- Ground elevation at well	41.2
2- Top of casing elevation	40.83
3- Protective cover type	8-inch diameter flush mount manhole vault
a) concrete pad dimensions	2 ft x 2 ft x 6-inches deep
4- Dia./type of well casing	2-inch inside diameter schedule 40 PVC
5- Type/slot size of screen	0.010-inch machine slotted PVC
6- Type filter pack	20/40 Sieve Size Silica Sand
7- Type of seal	3/8-inch bentonite pellets
8- Borehole diameter	7.25-inch
9- Grout	Bentonite grout
10- Groundwater Elevation	31.6

Note: Diagram not to scale.



PROJECT NUMBER 158814.ZK.EX.07	WELL NUMBER 166GW043D	SHEET 1 OF 1
WELL COMPLETION DIAGRAM		

PROJECT : SWMU 166, Zone K, Charleston Naval Complex	LOCATION : Charleston, South Carolina
DRILLING CONTRACTOR : Prosonic Corporation License # 1435	NORTHING: 388111.3
DRILLING METHOD AND EQUIPMENT USED : Rotosonic (standard 4- and 6-inch casings)	EASTING: 2300361.5
WATER LEVELS : 33.20	START : 5/14/2002 END: 5/14/2002 LOGGER : David Beverly



1- Ground elevation at well	41.4
2- Top of casing elevation	41.12
3- Protective cover type	8-inch diameter flush mount manhole vault
a) concrete pad dimensions	2 ft x 2 ft x 6-inches deep
4- Dia./type of well casing	2-inch inside diameter schedule 40 PVC
5- Type/slot size of screen	0.010-inch machine slotted PVC
6- Type filter pack	20/40 Sieve Size Silica Sand
7- Type of seal	3/8-inch bentonite pellets
8- Borehole diameter	6-inch
9- Grout	Bentonite grout
10- Groundwater Elevation	33.2

Note: Diagram not to scale.

Attachment 3

**Well Development and Purging Data
Monitoring Wells K166GW42D and K166GW43D**

Development Water Quality Parameters

166GW42D

Date/Time	Vol	pH	Cond.	Turb.	Temp
5-21-02 / 1354	*	6.39	0.175	15	22.5
5-21-02 / 1358	*	6.42	0.174	11	22.4
5-21-02 / 1402	*	6.42	0.175	9	22.6

* 40 gallons purged prior to taking water quality readings due to high turbidity.

166GW43D

Date/Time	Vol	pH	Cond.	Turb.	Temp
5-21-02 / 1548	*	6.01	0.174	15	22.4
5-21-02 / 1553	*	6.08	0.173	11	22.4
5-21-02 / 1559	*	6.1	0.172	8	22.4

* 36 gallons purged prior to taking water quality readings due to high turbidity.

Purge Water Quality Parameters

166GW42D

Date/Time	Vol	pH	Cond.	Turb.	DO	Temp	ORP
5-22-02 / 0835	1	6.14	0.24	0	2.71	21.8	-70
5-22-02 / 0911	2	6.45	0.22	0	3	21.9	-80
5-22-02 / 0930	3	6.61	0.22	0	3.1	21.6	-90

166GW43D

Date/Time	Vol	pH	Cond.	Turb.	DO	Temp	ORP
5-22-02 / 0855	1	7.08	0.2	5.6	0.6	22.8	-84
5-22-02 / 0856	2	6.79	0.2	0	0.2	22.6	-62
5-22-02 / 0857	3	6.98	0.19	0	0.11	22.6	-71

Attachment 4

**Revised Figure 4-3 TCE in Deep Groundwater
Table 2 Analytes Detected in Background Wells KGDKGW03D and KGDKGW04D
Well Development and Purging Data
Monitoring Wells KGDKGW03D and KGDKGW04D**

TABLE 2

Analytes Detected in Background Wells KGDKGW03D and KGDKGW04D
RFI Report Addendum, SWMU 166, Zone K, Charleston Naval Complex

Analyte	Sample Location	Date Collected	Result	Qualifier	Units
1,1-Dichloroethene	KGDKGW03D	11/18/2003	5.00000	U	ug/L
	KGDKGW04D	11/18/2003	5.00000	U	ug/L
cis-1,2-Dichloroethylene	KGDKGW03D	11/18/2003	5.00000	U	ug/L
	KGDKGW04D	11/18/2003	0.72000	J	ug/L
trans-1,2-Dichloroethene	KGDKGW03D	11/18/2003	5.00000	U	ug/L
	KGDKGW04D	11/18/2003	5.00000	U	ug/L
1,2-Dichloroethene (total)	KGDKGW03D	11/18/2003	5.00000	U	ug/L
	KGDKGW04D	11/18/2003	0.72000	J	ug/L
Tetrachloroethylene (PCE)	KGDKGW03D	11/18/2003	5.00000	U	ug/L
	KGDKGW04D	11/18/2003	5.00000	U	ug/L
Trichloroethylene (TCE)	KGDKGW03D	11/18/2003	3.80000	J	ug/L
	KGDKGW04D	11/18/2003	14.60000	=	ug/L
Vinyl chloride	KGDKGW03D	11/18/2003	10.00000	U	ug/L
	KGDKGW04D	11/18/2003	10.00000	U	ug/L

Development Water Quality Parameters

KGDKGW04D

Dat /Time	Vol	pH	Cond.	Turb.	Temp
10-7-03 / 1428	*	7.79	0.218	25	21.5
10-7-03 / 1430	*	6.76	0.217	10	21.4
10-7-03 / 1432	*	6.76	0.221	5	21.4

* 30 gallons purged prior to taking water quality readings due to high turbidity.

KGDKGW03D

Date/Time	Vol	pH	Cond.	Turb.	Temp
10-7-03 / 1327	*	6.77	0.302	21	21.4
10-7-03 / 1329	*	6.74	0.292	10	21.3
10-7-03 / 1332	*	6.71	0.286	3	21.3

* 33 gallons purged prior to taking water quality readings due to high turbidity.

Purge Water Quality Parameters

KGDKGW04D

Date/Time	Vol	pH	Cond.	Turb.	DO	Temp	ORP
11-18-03 / 1015	Initial	6.26	0.15	0.4	2.2	22	-131
11-18-03 / 1045	1	6.67	0.122	0	0.3	21.6	-171
11-18-03 / 1115	2	6.64	0.117	0	0.3	21.5	-163
11-18-03 / 1145	3	6.65	0.122	0	0.3	21.5	-161

KGDKGW03D

Date/Time	Vol	pH	Cond.	Turb.	DO	Temp	ORP
11-18-03 / 1028	Initial	5.88	0.247	7.4	1.49	22.34	-33
11-18-03 / 1049	1	6.47	0.236	0	0.08	21.63	-142
11-18-03 / 1112	2	6.6	0.24	0	0.03	21.92	-151
11-18-03 / 1132	3	6.68	0.251	0	0.02	21.88	-158

Attachment 5

Monitoring Well Construction Diagrams KGDKGW03D and KGDKGW04D

