

N61165.AR.004477  
CNC CHARLESTON  
5090.3a

REGULATORY COMMITTEE RESPONSE TO SOUTH CAROLINA DEPARTMENT OF  
HEALTH AND ENVIRONMENTAL CONTROL COMMENTS TO RCRA FACILITY  
INVESTIGATION REPORT ADDENDUM AREA OF CONCERN 701 (AOC 701) ZONE E WITH  
TRANSMITTAL CNC CHARLESTON SC  
2/25/2003  
CH2M HILL

AOC 701 ~~E~~ ZONE E  
RTC RFI Report Addendum (RO)

# CH2MHILL TRANSMITTAL

**To:** Jerry Stamps  
South Carolina Department of Health  
and Environmental Control  
Bureau of Land and Waste  
Management  
2600 Bull Street  
Columbia, SC 29201

**From:** Dean Williamson/CH2M-Jones  
(352) 335-7991

**Date:** February 25, 2003

**Re:** CH2M-Jones' Responses to Comments by SCDHEC regarding the *RFI Report Addendum, AOC 701, Zone E, Revision 0*

Quantity	Description
4	CH2M-Jones' Responses to Comments by SCDHEC regarding the <i>RFI Report Addendum, AOC 701, Zone E, Revision 0</i> – Originally Submitted on October 4, 2002

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

Remarks:

Copy To:

Jo Cherie Overcash/SCDHEC, w/att  
Dann Spariosu/USEPA, w/att  
Rob Harrell/Navy, w/att  
Gary Foster/CH2M-Jones, w/att

### **Hydrogeology Comments Prepared by Jo Cherie Overcash**

The Division of Hydrogeology recommends that a no further action (NFA) decision for groundwater at AOC 701 be granted at this time under the following two conditions:

1. In order to substantiate the NFA decision, the Navy include historical data from downgradient grid well pair EGDEGW029 and EGDEGW029D. According to Figure 2-1 entitled Shallow Groundwater Contour Map, the direction of shallow groundwater flow is southeasterly. Grid well pair EGDEGW029 and EGDEGW029D are approximately fifty feet hydraulically downgradient of the existing monitoring wells at AOC 701.

**CH2M-Jones Response:**

*Please refer to Tables 1 through 5, which list any constituents detected in grid well EGDEGW029 and EGDEGW029D, and are attached to this response to comments. Based on review of the historical detections, all constituents are below their respective chemical of potential concern (COPC) screening criteria.*

2. In order to substantiate the NFA decision, the Navy provide a potentiometric map of deep groundwater based on groundwater elevation data collected at the time of groundwater sampling.

**CH2M-Jones Response:**

*CH2M-Jones has prepared a groundwater contour map of the deep zone, based on the six deep aquifer water level elevation measurements made during the AOC 701 field investigation. This information is provided in Figure 1, which is attached to this response to comments.*



**TABLE 1**  
 Semivolatile Organic Compounds Historically Detected in Shallow Grid Well GDEGW029  
 Responses to Comments, RFI Report Addendum, Revision 0, AOC 701, Zone E, Charleston Naval Complex

Analyte	Sample ID	Station ID	Concentration (µg/L)	Qualifier	Date Collected	MCL/RBC
Benzoic acid	GDEGW02901	EGDEGW029	50	U	11/1/96	15,000 <sup>a</sup>
	GDEGW029A2	EGDEGW029	50	U	3/5/97	
	GDEGW029A3	EGDEGW029	50	U	6/25/97	
	GDEGW02904	EGDEGW029	5	J	10/7/97	

All values are presented in units of micrograms per liter (µg/L).

<sup>a</sup>In the absence of a maximum contaminant level (MCL), the U.S. Environmental Protection Agency (EPA) Region III tap water risk-based concentration (RBC) is used.

- J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.
- U Indicates that the chemical was not detected.

**TABLE 2**  
 Inorganic Constituents Historically Detected in Shallow Grid Well GDEGW029  
 Responses to Comments, RFI Report Addendum, Revision 0, AOC 701, Zone E, Charleston Naval Complex

Analyte	Sample ID	Station ID	Concentration ( $\mu\text{g/L}$ )	Qualifier	Date Collected	Zone E Shallow Groundwater Range of Background Concentrations	MCL/RBC
Aluminum	GDEGW02901	EGDEGW029	7,540	J	11/1/96	19 - 16,000	3,700 <sup>a</sup>
	GDEGW029A2	EGDEGW029	257	=	3/5/97		
	GDEGW029A3	EGDEGW029	529	=	6/25/97		
	GDEGW02904	EGDEGW029	370	=	10/7/97		
Arsenic	GDEGW02901	EGDEGW029	20.5	=	11/1/96	3 - 316	50
	GDEGW029A2	EGDEGW029	6.7	J	3/5/97		
	GDEGW029A3	EGDEGW029	13	=	6/25/97		
	GDEGW02904	EGDEGW029	9.2	J	10/7/97		
Barium	GDEGW02901	EGDEGW029	25.8	J	11/1/96	6 - 398	2,000
	GDEGW029A2	EGDEGW029	9	J	3/5/97		
	GDEGW029A3	EGDEGW029	10.3	J	6/25/97		
	GDEGW02904	EGDEGW029	6.9	J	10/7/97		
Calcium	GDEGW02901	EGDEGW029	36,000	=	11/1/96	1,170 - 260,000	NA
	GDEGW029A2	EGDEGW029	29,600	=	3/5/97		
	GDEGW029A3	EGDEGW029	25,700	=	6/25/97		
	GDEGW02904	EGDEGW029	21,700	=	10/7/97		

**TABLE 2**  
 Inorganic Constituents Historically Detected in Shallow Grid Well GDEGW029  
 Responses to Comments, RFI Report Addendum, Revision 0, AOC 701, Zone E, Charleston Naval Complex

Analyte	Sample ID	Station ID	Concentration ( $\mu\text{g/L}$ )	Qualifier	Date Collected	Zone E Shallow Groundwater	
						Range of Background Concentrations	MCL/RBC
Chromium, Total	GDEGW02901	EGDEGW029	11	J	11/1/96	0.8 - 31	100
	GDEGW029A2	EGDEGW029	5.2	U	3/5/97		
	GDEGW029A3	EGDEGW029	1.7	J	6/25/97		
	GDEGW02904	EGDEGW029	1.4	U	10/7/97		
Cobalt	GDEGW02901	EGDEGW029	1.9	J	11/1/96	0.9 - 44	220 <sup>a</sup>
	GDEGW029A2	EGDEGW029	0.8	U	3/5/97		
	GDEGW029A3	EGDEGW029	1.3	U	6/25/97		
	GDEGW02904	EGDEGW029	0.8	U	10/7/97		
Copper	GDEGW02901	EGDEGW029	1.5	U	11/1/96	0.9 - 8	1,300
	GDEGW029A2	EGDEGW029	2.3	J	3/5/97		
	GDEGW029A3	EGDEGW029	1.4	U	6/25/97		
	GDEGW02904	EGDEGW029	1.4	U	10/7/97		
Iron	GDEGW02901	EGDEGW029	14,100	=	11/1/96	144 - 76,600	1,100 <sup>a</sup>
	GDEGW029A2	EGDEGW029	8,910	=	3/5/97		
	GDEGW029A3	EGDEGW029	10,900	=	6/25/97		
	GDEGW02904	EGDEGW029	7,060	=	10/7/97		

**TABLE 2**  
 Inorganic Constituents Historically Detected in Shallow Grid Well GDEGW029  
 Responses to Comments, RFI Report Addendum, Revision 0, AOC 701, Zone E, Charleston Naval Complex

Analyte	Sample ID	Station ID	Concentration (µg/L)	Qualifier	Date Collected	Zone E Shallow Groundwater Range of Background Concentrations	MCL/RBC
Lead	GDEGW02901	EGDEGW029	5.4	J	11/1/96	2 - 47	15
	GDEGW029A2	EGDEGW029	0.9	U	3/5/97		
	GDEGW029A3	EGDEGW029	0.9	U	6/25/97		
	GDEGW02904	EGDEGW029	0.9	U	10/7/97		
Magnesium	GDEGW02901	EGDEGW029	16,300	=	11/1/96	790 - 1,160,000	NA
	GDEGW029A2	EGDEGW029	15,400	=	3/5/97		
	GDEGW029A3	EGDEGW029	15,200	=	6/25/97		
	GDEGW02904	EGDEGW029	13,400	=	10/7/97		
Manganese	GDEGW02901	EGDEGW029	58.2	J	11/1/96	2 - 2,650	510 <sup>a</sup>
	GDEGW029A2	EGDEGW029	45.2	=	3/5/97		
	GDEGW029A3	EGDEGW029	38	=	6/25/97		
	GDEGW02904	EGDEGW029	30.4	=	10/7/97		
Nickel	GDEGW02901	EGDEGW029	3.7	J	11/1/96	0.9 - 17	73 <sup>a</sup>
	GDEGW029A2	EGDEGW029	2.1	U	3/5/97		
	GDEGW029A3	EGDEGW029	0.7	UJ	6/25/97		
	GDEGW02904	EGDEGW029	0.7	U	10/7/97		

**TABLE 2**  
 Inorganic Constituents Historically Detected in Shallow Grid Well GDEGW029  
 Responses to Comments, RFI Report Addendum, Revision 0, AOC 701, Zone E, Charleston Naval Complex

Analyte	Sample ID	Station ID	Concentration ( $\mu\text{g/L}$ )	Qualifier	Date Collected	Zone E Shallow Groundwater Range of Background Concentrations	MCL/RBC
Potassium	GDEGW02901	EGDEGW029	13,100	=	11/1/96	1,320 - 298,000	NA
	GDEGW029A2	EGDEGW029	10,800	=	3/5/97		
	GDEGW029A3	EGDEGW029	10,600	=	6/25/97		
	GDEGW02904	EGDEGW029	12,300	=	10/7/97		
Sodium	GDEGW02901	EGDEGW029	83,500	=	11/1/96	NA	NA
	GDEGW029A2	EGDEGW029	56,300	=	3/5/97		
	GDEGW029A3	EGDEGW029	38,600	=	6/25/97		
	GDEGW02904	EGDEGW029	47,700	=	10/7/97		
Vanadium	GDEGW02901	EGDEGW029	12.6	J	11/1/96	0.6 - 26	26 <sup>a</sup>
	GDEGW029A2	EGDEGW029	1.1	J	3/5/97		
	GDEGW029A3	EGDEGW029	1.8	J	6/25/97		
	GDEGW02904	EGDEGW029	1.5	U	10/7/97		
Zinc	GDEGW02901	EGDEGW029	20.2	J	11/1/96	5 - 141	1,100 <sup>a</sup>
	GDEGW029A2	EGDEGW029	35.8	U	3/5/97		
	GDEGW029A3	EGDEGW029	6.2	J	6/25/97		
	GDEGW02904	EGDEGW029	5.8	U	10/7/97		

All values are presented in units of micrograms per liter ( $\mu\text{g/L}$ ).

**TABLE 2**  
 Inorganic Constituents Historically Detected in Shallow Grid Well GDEGW029  
 Responses to Comments, RFI Report Addendum, Revision 0, AOC 701, Zone E, Charleston Naval Complex

Analyte	Sample ID	Station ID	Concentration ( $\mu\text{g/L}$ )	Qualifier	Date Collected	Zone E Shallow Groundwater Range of Background Concentrations	MCL/RBC
---------	-----------	------------	--------------------------------------	-----------	-------------------	---	---------

<sup>a</sup>In the absence of a maximum contaminant level (MCL), the U.S. Environmental Protection Agency (EPA) Region III tap water risk-based concentration (RBC) is used.

- = Indicates that the analyte was detected at the concentration shown.
- J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.
- U Indicates that the chemical was not detected.
- UJ Indicates that the chemical was not detected and that the reporting limit is estimated.
- NA Not applicable/not available

**TABLE 3**  
 Volatile Organic Compounds Historically Detected in Deep Grid Well GDEGW029D  
 Responses to Comments, RFI Report Addendum, AOC 701, Zone E, Charleston Naval Complex

Analyte	Sample ID	Station ID	Concentration (µg/L)	Qualifier	Date Collected	MCL/RBC
Carbon Disulfide	GDEGW29D01	EGDEGW29D	1	J	11/1/96	100 <sup>a</sup>
	GDEGW29DA2	EGDEGW29D	5	U	3/5/97	
	GDEGW29DA3	EGDEGW29D	5	U	6/25/97	
	GDEGW29D04	EGDEGW29D	5	U	10/7/97	
Methyl isobutyl ketone (4-Methyl-2-pentanone)	GDEGW29D01	EGDEGW29D	2	J	11/1/96	14 <sup>a</sup>
	GDEGW29DA2	EGDEGW29D	10	U	3/5/97	
	GDEGW29DA3	EGDEGW29D	10	U	6/25/97	
	GDEGW29D04	EGDEGW29D	10	U	10/7/97	

All values are presented in units of micrograms per liter (µg/L).

<sup>a</sup>In the absence of a maximum contaminant level (MCL), the U.S. Environmental Protection Agency (EPA) Region III tap water risk-based concentration (RBC) is used.

- J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.
- U Indicates that the chemical was not detected.

**TABLE 4**  
Semivolatile Organic Compounds Historically Detected in Deep Grid Well GDEGW029D  
*Responses to Comments, RFI Report Addendum, AOC 701, Zone E, Charleston Naval Complex*

Analyte	Sample ID	Station ID	Concentration (µg/L)	Qualifier	Date Collected	MCL/RBC
Benzoic acid	GDEGW29D01	EGDEGW29D	1	J	11/1/96	15,000 <sup>a</sup>
	GDEGW29DA2	EGDEGW29D	50	U	3/5/97	
	GDEGW29DA3	EGDEGW29D	50	U	6/25/97	

All values are presented in units of micrograms per liter (µg/L).

<sup>a</sup>In the absence of a maximum contaminant level (MCL), the U.S. Environmental Protection Agency (EPA) Region III tap water risk-based concentration (RBC) is used.

- J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.
- U Indicates that the chemical was not detected.

**TABLE 5**  
 Inorganic Constituents Historically Detected in Deep Grid Well GDEGW029D  
 Responses to Comments, RFI Report Addendum, AOC 701, Zone E, Charleston Naval Complex

Analyte	Sample ID	Station ID	Concentration (µg/L)	Qualifier	Date Collected	Zone E Deep Groundwater Range of Background Concentrations	MCL/RBC
Arsenic	GDEGW29D01	EGDEGW29D	32	=	11/1/96	3 – 312	50
	GDEGW29DA2	EGDEGW29D	34	=	3/5/97		
	GDEGW29DA3	EGDEGW29D	37	=	6/25/97		
	GDEGW29D04	EGDEGW29D	40	=	10/7/97		
Barium	GDEGW29D01	EGDEGW29D	62.2	J	11/1/96	12 – 322	2,000
	GDEGW29DA2	EGDEGW29D	59.3	J	3/5/97		
	GDEGW29DA3	EGDEGW29D	49.6	J	6/25/97		
	GDEGW29D04	EGDEGW29D	40.7	=	10/7/97		
Calcium	GDEGW29D01	EGDEGW29D	59,100	=	11/1/96	44,400 – 391,000	NA
	GDEGW29DA2	EGDEGW29D	55,400	=	3/5/97		
	GDEGW29DA3	EGDEGW29D	50,200	=	6/25/97		
	GDEGW29D04	EGDEGW29D	46,400	=	10/7/97		
Cobalt	GDEGW29D01	EGDEGW29D	1.4	J	11/1/96	1.1 – 14	220 <sup>a</sup>
	GDEGW29DA2	EGDEGW29D	2.9	J	3/5/97		
	GDEGW29DA3	EGDEGW29D	2.4	U	6/25/97		
	GDEGW29D04	EGDEGW29D	1.5	U	10/7/97		
Copper	GDEGW29D01	EGDEGW29D	1.4	U	11/1/96	0.6 – 6	1,300
	GDEGW29DA2	EGDEGW29D	3.1	J	3/5/97		
	GDEGW29DA3	EGDEGW29D	1.4	U	6/25/97		
	GDEGW29D04	EGDEGW29D	1.4	U	10/7/97		
Iron	GDEGW29D01	EGDEGW29D	12,600	=	11/1/96	19 – 26,000	1,100
	GDEGW29DA2	EGDEGW29D	16,900	=	3/5/97		
	GDEGW29DA3	EGDEGW29D	15,700	=	6/25/97		
	GDEGW29D04	EGDEGW29D	13,500	=	10/7/97		
Magnesium	GDEGW29D01	EGDEGW29D	20,800	=	11/1/96	3,190 – 1,370,000	NA
	GDEGW29DA2	EGDEGW29D	22,900	=	3/5/97		

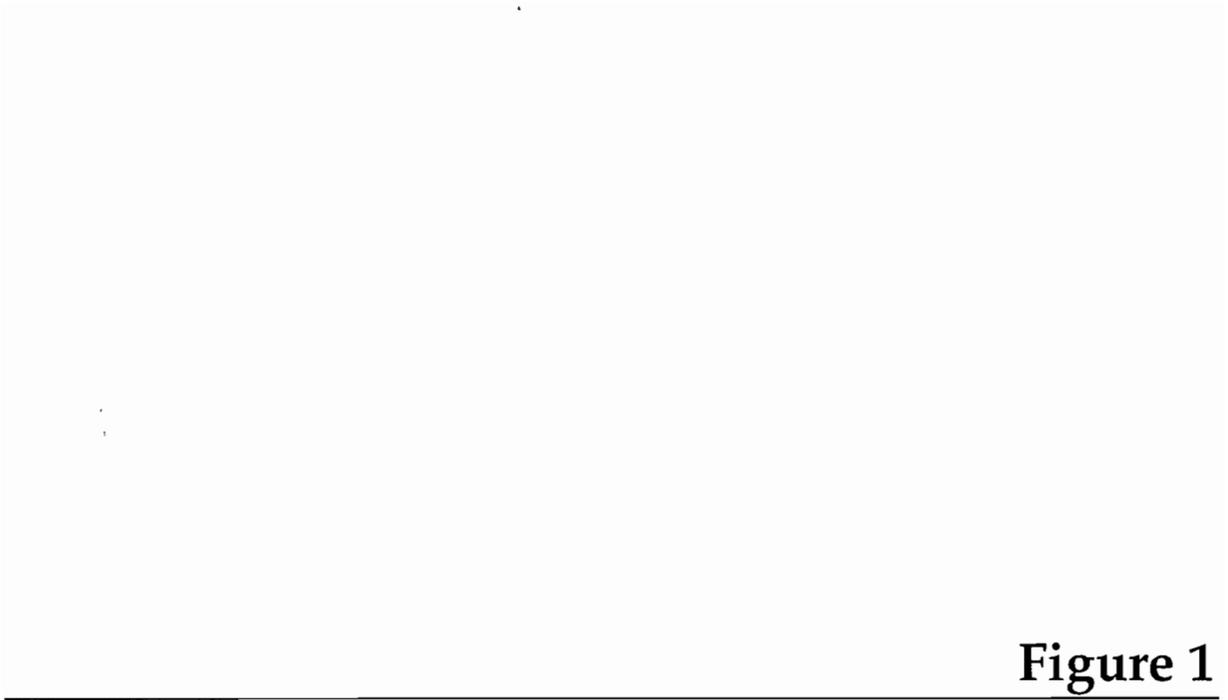
**TABLE 5**  
Inorganic Constituents Historically Detected in Deep Grid Well GDEGW029D  
*Responses to Comments, RFI Report Addendum, AOC 701, Zone E, Charleston Naval Complex*

Analyte	Sample ID	Station ID	Concentration (µg/L)	Qualifier	Date Collected	Zone E Deep Groundwater Rang of Background Concentrations	MCL/RBC
Magnesium	GDEGW29DA3	EGDEGW29D	22,800	=	6/25/97	3,190 – 1,370,000	NA
	GDEGW29D04	EGDEGW29D	20,100	=	10/7/97		
Manganese	GDEGW29D01	EGDEGW29D	331	J	11/1/96	1.3 – 1,660	510 <sup>a</sup>
	GDEGW29DA2	EGDEGW29D	264	=	3/5/97		
	GDEGW29DA3	EGDEGW29D	117	=	6/25/97		
	GDEGW29D04	EGDEGW29D	94.5	=	10/7/97		
Nickel	GDEGW29D01	EGDEGW29D	1.6	J	11/1/96	0.8 – 46	73 <sup>a</sup>
	GDEGW29DA2	EGDEGW29D	2.7	U	3/5/97		
	GDEGW29DA3	EGDEGW29D	1.7	J	6/25/97		
	GDEGW29D04	EGDEGW29D	1.4	U	10/7/97		
Potassium	GDEGW29D01	EGDEGW29D	13,100	=	11/1/96	1,720 – 351,000	NA
	GDEGW29DA2	EGDEGW29D	13,100	=	3/5/97		
	GDEGW29DA3	EGDEGW29D	12,500	=	6/25/97		
	GDEGW29D04	EGDEGW29D	12,200	=	10/7/97		
Sodium	GDEGW29D01	EGDEGW29D	122,000	=	11/1/96	NA	NA
	GDEGW29DA2	EGDEGW29D	930,00	=	3/5/97		
	GDEGW29DA3	EGDEGW29D	577,00	=	6/25/97		
	GDEGW29D04	EGDEGW29D	785,00	=	10/7/97		

All values are presented in units of micrograms per liter (µg/L).

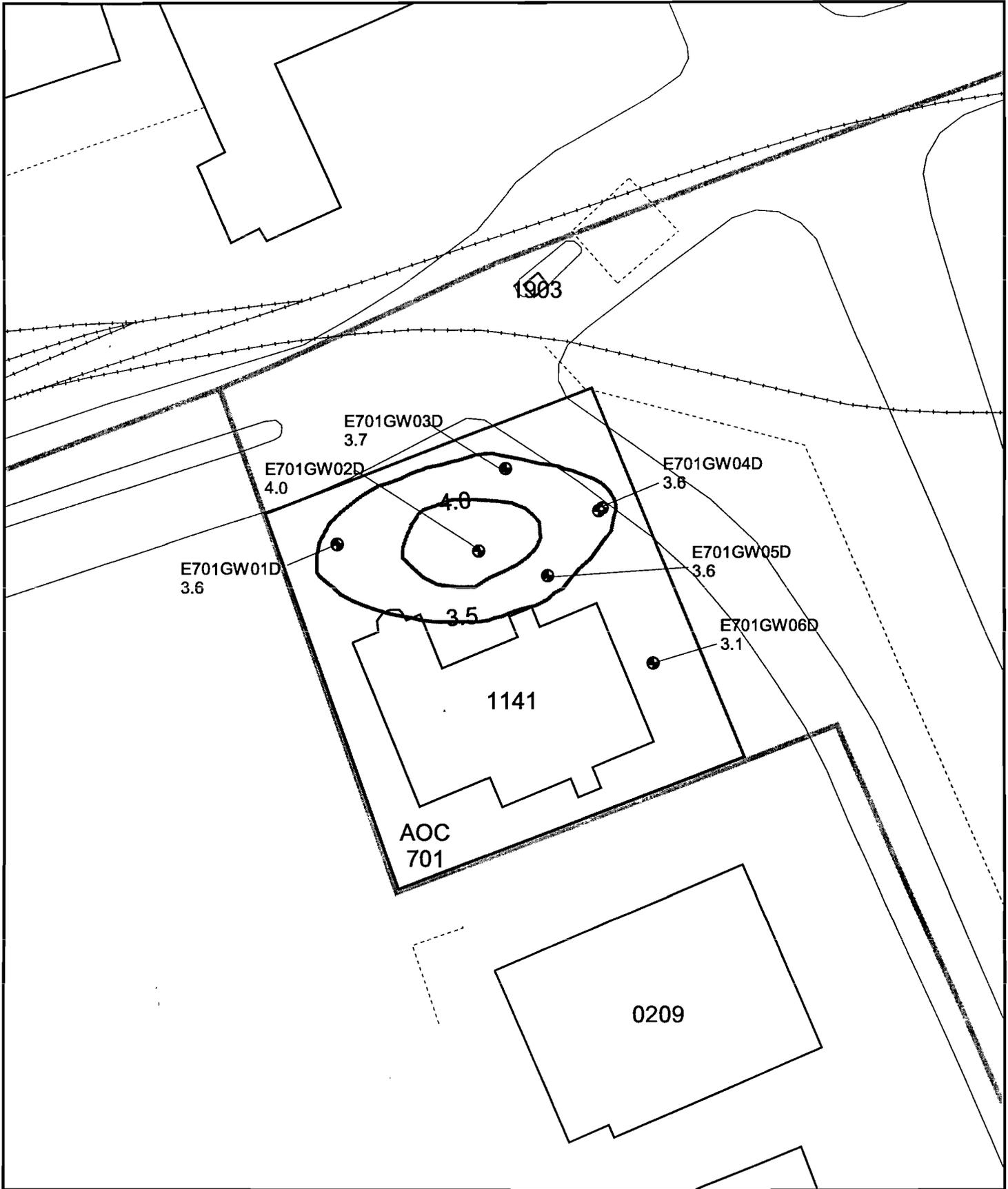
<sup>a</sup>In the absence of a maximum contaminant level (MCL), the U.S. Environmental Protection Agency (EPA) Region III tap water risk-based concentration (RBC) is used.

- = Indicates that the analyte was detected at the concentration shown.
- J Indicates an estimated value. One or more quality control (QC) parameters were outside control limits or the value was detected below the laboratory's quantification limit.
- U Indicates that the chemical was not detected.
- UJ Indicates that the chemical was not detected and that the reporting limit is estimated.
- NA Not applicable/not available

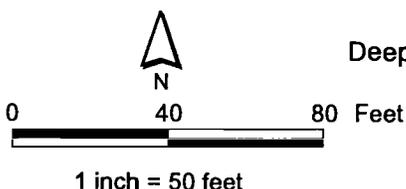


**Figure 1**

---



- Deep Groundwater Elevation (ft above msl)
- AOC 701 Deep Monitoring Well
- Fence
- Railroads
- Roads
- Buildings
- AOC Boundary
- Zone Boundary



**Figure 1**  
 Deep Groundwater Contour Map, Sept. 2002  
 AOC 701  
 Charleston Naval Complex

**CH2MHILL**