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CORRECTIVE ACTION REPORT FOR BUILDING 640 AND SITE 4 ZONE H CNC  
CHARLESTON SC  
10/01/2006  
CH2M HILL

**Corrective Action Report  
Building 640 and Site 4, Zone H  
Charleston Naval Complex  
North Charleston, South Carolina  
SCDHEC Site ID No. 00955**

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**Water Monitoring, Assessment &  
Protection Division**

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**Charleston Naval Complex**  
**North Charleston, South Carolina**

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## **1.0 Introduction**

### **1.1 Charleston Naval Complex Background**

In 1993, Naval Base (NAVBASE) Charleston was added to the list of bases scheduled for closure as part of the Defense Base Realignment and Closure Act, which regulates closure and transition of property to the community. The Charleston Naval Complex (CNC) was formed as a result of the dis-establishment of the Charleston Naval Shipyard and NAVBASE on April 1, 1996. Corrective Action (CA) activities for Site 4, Building 640, Zone H are being conducted in accordance with the Underground Storage Tank (UST) Program of the South Carolina Department of Health and Environmental Control (SCDHEC).

### **1.2 General Site Description and Remedial**

The CNC is located in the City of North Charleston, on the east and west bank of the Cooper River in Charleston County and Berkley County, South Carolina as shown in **Figure 1**. This installation consists of two major areas: an undeveloped dredge materials area on the east bank of the Cooper River on Daniel Island in Berkley County, and a developed area on the west bank of the Cooper River. The developed portion of the base is on the peninsula bounded on the west by the Ashley River and on the east by the Cooper River. This site is located within the developed portion of the base.

Building 640 was the former Chief Petty Officer Club and Mess. Two petroleum systems, UST 640B and AST 640, were used to supply heating oil to the building. UST 640B was a 3,000 gallon steel tank reportedly installed in 1963. The tank was located approximately 10 feet north of the northwestern corner of Building 640. AST 640 was a 1,000-gallon steel tank reportedly installed more than 25 years ago to replace UST 640B. The tank was located approximately 15 feet west of the northwestern corner of Building 640. Tank locations are shown in **Figure 2**. SCDHEC has designated Building 640, Site 4 with identification number 00955.

In January and February 1997, SPORTENVDETHASN excavated and removed tanks AST 640 and UST 640B. An Assessment Report for Building 640 was completed by SPORTENVDETHASN following tank removal activities. During tank closure activities,

Polynuclear aromatic hydrocarbons (PAHs) were identified in soil samples, no groundwater was encountered in any excavations, and mild petroleum odors were observed during excavation activities.

From December 1998 through March 1999, Tetra Tech, NUS (TTNUS) completed a Rapid Assessment (RA) for Sites 4. In SCDHEC's response letter to the RA, dated September 27, 1999, the department recommended a corrective action plan be developed in order to define and remediate the hydrocarbon contamination. CH2M-Jones prepared a Corrective Action Plan (CAP), dated December 2000, which was approved by SCDHEC on January 2, 2001. The plan proposed the installation of passive-floating intake skimmers to recover product from site monitoring wells followed by semi-annual groundwater monitoring.

CH2M-Jones initiated free product recovery on January 17, 2001. Bailers were used to recover the free product in-lieu of passive floating intake skimmers. Product recovery was completed on July 9, 2001. Approximately one-half gallon of oily-water was recovered using bailers.

Between August 2, 2001, and July 31, 2002, CH2M-Jones submitted four quarterly monitoring reports all of which indicated that hydrocarbon contamination remained below RBSLs in all wells. On May 21, 2002, a No Further Action (NFA) was requested by CH2M-Jones. In a SCDHEC response letter dated, June 14, 2002, the department requested the installation of two additional wells in the vicinity of CNC04-M01 to verify that all free product had been remediated. The monitoring wells were installed on July 2, 2002, as proposed by SCDHEC. Monitoring wells U04GW001 (Alias: CNC04-M01, H640G04W1), U04GW012, and U04GW013 were sampled on July 2 and 3, 2002. On July 31, 2002, CH2M-Jones submitted a monitoring report in which a NFA was requested. On August 19, 2002, SCDHEC accepted the NFA request, closing out the site.

During well abandonment activities performed on September 12, 2002, free product was detected within monitoring wells U04GW001 and CNC04-MW12. As a result, the wells were not abandoned. The remaining wells onsite were abandoned in accordance with South Carolina Well Standards and Regulations R. 61-71.

Free product recovery activities were initiated within monitoring wells UO4GW001 and CNC04-MW12 using oil-only absorbent socks that have been replaced on a routine bases.

CH2M-Jones removed the oil-only absorbent socks from each well on April 5, 2006. The wells were allowed to recharge and subsequently measured for free product thickness on June 14, 2006. No measurable free product was detected within monitoring well CNC04MW12, but the well did present a strong odor. Monitoring well CNC04GW01 displayed beads of free product along with a strong odor. To date, the condition of each well remains unchanged. As a result, the wells were not sampled during the scheduled October 5, 2006 sampling event.

## **2.0 Conclusions and Recommendations**

The on-going exchange of oil-only absorbent socks in the affected monitoring wells continues to reduce the volume of free product at the site, and CH2M-Jones recommends that free product recovery activities continue. Once the free product has been abated, groundwater samples may be collected to determine if dissolved-phase hydrocarbons are present within the existing wells.

# Tables

**Table 1  
Free Product Measurement and Collection Quantities**

Well No.	Date	DTP	DTW	FP Column (ft)	Comments
CNC04M01	1/17/2001	6.46	not obtained	not obtained	.01 gallons bailed
	2/15/2001	6.33	6.42	0.09	.01 gallons bailed
	3/5/2001	not obtained	not obtained	not obtained	.01 gallons bailed
	3/26/2001	5.84	5.84	0.0	.01 gallons bailed
	4/30/2001	6.65	6.70	0.05	.01 gallons bailed
	7/9/2001	not obtained	not obtained	n/m	.01 gallons bailed
	7/10/2001	6.34	6.35	0.01	No product removed
	5/1/2003	5.10	5.17	0.07	Installed absorbent sock
	5/15/2003	not obtained	not obtained	not obtained	Replace absorbent sock
	10/3/2003	no product present	5.49	0.0	Replace absorbent sock
	12/12/2003	no product present	5.51	0.0	Replace absorbent sock
	1/12/2004	no product present	6.22	0.0	Replace absorbent sock
	2/12/2004	no product present	5.31	0.0	Sock 1/2 full
	5/28/2004	no product present	5.71	0.0	Replace absorbent sock
	7/14/2004	no product present	3.88	0.0	Sock 1/4 full
	8/20/2004	4.59	4.61	0.02	Replace absorbent sock
	10/25/2004	no product present	5.84	0.0	Replace absorbent sock
	2/7/2005	no product present	5.04	0.00	Replace absorbent sock
	5/4/2005	sheen	5.25	0.0	Replace absorbent sock
	6/10/2005	4.8	4.8	0.0	Replace absorbent sock
	7/1/2005	3.8	3.8	0.0	Remove absorbent sock
	8/4/2005	sheen	4.55	0.0	Installed absorbent sock
	9/30/2005	4.15	4.15	0.0	Replace absorbent sock
	10/21/2005	beads	4.01	0.0	Sock 1/2 full
	12/23/2005				Remove absorbent sock
	12/27/2005	sheen	4.7	0.0	sheen / odor
	2/17/2006	beads	4.39	0.0	Replace absorbent sock
	4/5/2006	beads	5.06	0.0	Sock 1/8 full / remove sock
	6/14/2006	beads	5.26	0.0	beads of free product
	7/17/2006	beads	5.41	0.0	beads of free product
	9/7/2006	beads	5.15	0.0	beads of free product
10/5/2006	beads	5.18	0.0	beads of free product	
CNC04M12	5/1/2003	5.55	5.55	0.0	Installed absorbent sock
	5/15/2003	not obtained	not obtained	not obtained	Replace absorbent sock
	10/3/2003	no product present	5.87	0.0	Replace absorbent sock
	12/12/2003	no product present	5.97	0.0	Replace absorbent sock
	1/12/2004	no product present	6.65	0.0	Replace absorbent sock
	2/12/2004	no product present	5.79	0.0	Sock 1/3 full
	5/28/2004	no product present	6.10	0.0	Sock 1/3 full
	7/14/2004	no product present	4.20	0.0	Replace absorbent sock
	8/20/2004	Beads of FP Present	5.3	0.0	Replace absorbent sock
	10/25/2004	no product present	5.87	0.0	Replace absorbent sock
	2/7/2005	no product present	5.45	0.0	Replace absorbent sock
	5/4/2005	sheen	6.25	0.0	Replace absorbent sock
	6/10/2005	5.65	5.65	0.0	Replace absorbent sock
	7/1/2005	4.15	4.15	0.0	Remove absorbent sock
	8/4/2005	sheen	5.73	0.0	Installed absorbent sock
	9/30/2005	5.55	5.55	0.0	Replace absorbent sock
	10/21/2005	beads	5.25	0.0	Sock 1/2 full
12/23/2005				Remove absorbent sock	
12/27/2005	5.10	5.11	0.01	beads of free product	

Table 1 cont.

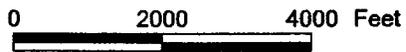
Free Product Measurement and Collection Quantities

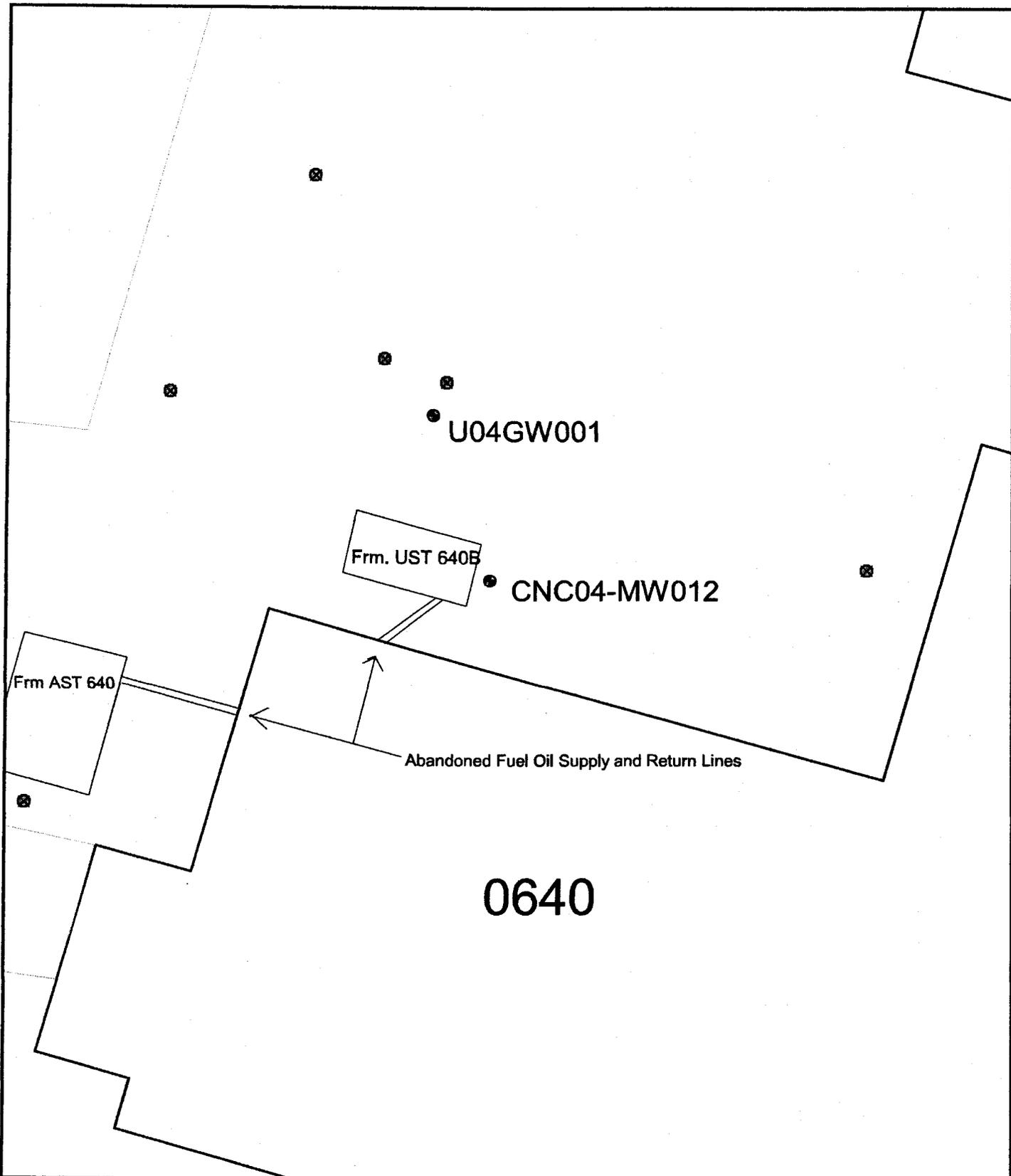
Well No.	Date	DTP	DTW	FP Column (ft)	Comments
CNC04M12	2/17/2006	4.98	4.98	0	Installed absorbent sock
	4/5/2006	sheen	5.55	0	Remove absorbent sock
	6/14/2006	sheen	5.7	0	sheen
	7/17/2006	sheen	5.86	0	sheen
	9/7/2006	sheen	5.41	0	sheen
	10/5/2006	sheen	5.45	0	sheen

## Figures

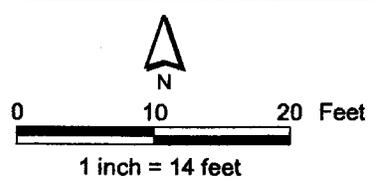


Building 640, Site 4

<ul style="list-style-type: none"> <li> Fence</li> <li> Roads - Lines</li> <li> Pavement</li> <li> Buildings</li> </ul>	 <p>N</p>  <p>0      2000      4000 Feet</p> <p>1 inch = 14 feet</p>	<p>Location Map          Building 640, site 4, ZONE H          Charleston National Complex</p>
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-  Abandoned
-  Active
-  Fence
-  Roads - Lines
-  Pavement
-  Buildings



**Figure 2**  
 Site Map  
 Building 640, site 4, ZONE H  
 Charleston Naval Complex