

Final Technical Memorandum

# Summary of Well Abandonment and Repair Activities

St. Juliens Creek Annex  
Chesapeake Virginia



Prepared for

**Department of the Navy**  
**Naval Facilities Engineering Command**  
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Prepared by

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## Summary of Well Abandonment and Repair Activities at St. Juliens Creek Annex, Chesapeake, Virginia

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This technical memorandum summarizes well abandonment and repair activities conducted at Sites 2 and 21 at St. Juliens Creek Annex (SJCA) from November 17 through 19, 2009 (Figure 1). Deep groundwater monitoring wells SJS02-MW10D and SJS21-MW01D at Sites 2 and 21, respectively (Figure 2), were abandoned based on the decision to do so by the SJCA Partnering Team during the November 2008 partnering meeting. Shallow groundwater monitoring well SJS02-MW12S at Site 2 was repaired based on the observation during Quarterly Installation Restoration site inspections that the well was not locking properly. The well abandonment and repair was conducted by Parratt-Wolff under the oversight of a CH2M HILL geologist. Field notes are provided as an attachment.

### Monitoring Well Abandonment

Monitoring well abandonment was conducted based on the procedures developed in the Technical Memorandum Work Plan (CH2M HILL, 2009).

### Monitoring Well SJS02-MW10D Abandonment

The abandonment of deep monitoring well SJS02-MW10D was initiated on November 17, 2009. The total depth of SJS02MW10D was measured to be approximately 69 feet below ground surface (bgs), consistent with the well construction record (68 feet bgs), prior to abandonment. The concrete pad around the stick-up protective casing was then broken with a jack hammer and removed. Bollards were pulled from the ground, and the stick-up protective casing and polyvinyl chloride (PVC) well riser were saw-cut off approximately 1.5 feet bgs. All debris from well abandonment was placed in the Parratt-Wolff vehicle for offsite disposal at a Subtitle D landfill. A tremmie pipe was then lowered to the bottom of the well, and a bentonite slurry of 1 to 2 pounds bentonite per gallon water was mixed and pumped in the well via the tremmie pipe until the bentonite slurry mixture came out the top of the well casing. The tremmie pipe remained submerged in the bentonite slurry mixture during the entire filling process. Following filling, the tremmie pipe was removed, the slurry was topped off, the well was capped, and the ground surface was restored to match the surrounding conditions. Two days later, on November 19, 2009, the area around the abandoned well was excavated to reveal the well casing, and the bentonite slurry was measured to have subsided approximately 3.5 feet below the top of casing. The slurry in the well was topped off with bentonite chips and recapped. The surrounding area was restored with topsoil and compacted to grade.

### **Monitoring Well SJS21-MW01D Abandonment**

The abandonment of deep monitoring well SJS21-MW01D was initiated on November 17, 2009. The total depth of SJS21MW01D was measured to be approximately 44 feet bgs, which was consistent with the well construction record (43 feet bgs), prior to abandonment. A jack hammer was used to break up the concrete around the flush mount steel vault and both the concrete and steel vault were removed. The PVC casing was broken off at approximately 1 foot bgs. All well abandonment debris was placed in the Parratt Wolff vehicle for disposal at a subtitle D landfill. A tremmie pipe was then lowered to the bottom of the well, and a bentonite slurry of 1 to 2 pounds bentonite per gallon water was mixed and pumped in the well via the tremmie pipe until the slurry came out the top of the well casing. The tremmie pipe remained submerged in the bentonite slurry mixture during the entire filling process. Following filling, the tremmie pipe was removed and the slurry was topped off. The slurry was topped off a second time before leaving the site, and the well was capped and covered temporarily with sand bags and barricaded. Two days later, on November 19, 2009, the abandoned well was uncovered and uncapped, and the bentonite slurry was measured to have subsided approximately 2 feet below the top of casing. The slurry in the well was topped off with bentonite chips and recapped. The hole left by the removal of the vault was then backfilled with filter pack sand to about an inch below the bottom of the adjacent asphalt surface. The hole was then patched with cold patch asphalt in two thin lifts, with each lift being individually compacted.

### **Monitoring Well Repair**

On November 17, 2009, the flush mount lid on SJS02-MW12S was removed, and sand, silt and clay was removed from the vault box to an inch or so below the top of the PVC well riser. The o-ring that seals the vault lid was removed and cleaned. The groove and lip that the o-ring seats in were also cleaned with a brush and water. The underside of the vault cover was brushed off where the gasket seats and the threads in the bolt holes in the vault rim were cleaned. The gasket was re-inserted in the gasket groove, the lid was replaced, and new bolts were used to tighten down the lid. The lid appeared to seal tightly, so no further repairs were deemed necessary at the time.

### **Reference**

CH2M HILL. 2009. *Final Technical Memorandum Work Plan for Monitoring Well Abandonment, St. Juliens Creek Annex, Chesapeake, Virginia*. October.

## Figures

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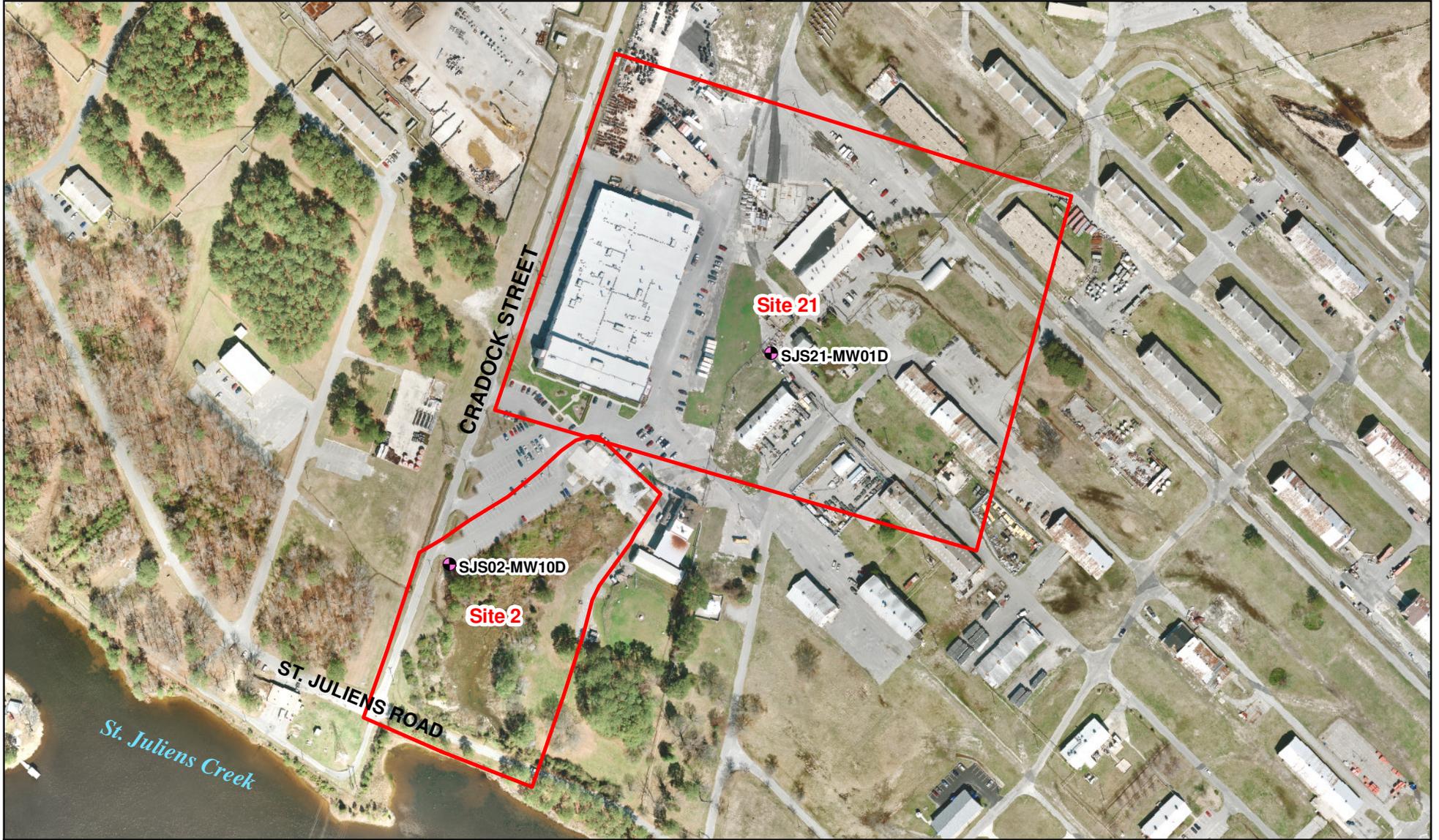


**Legend**

-  St. Juliens Creek Annex
-  Site Boundaries



Figure 1  
Site Locations  
St. Juliens Creek Annex  
Chesapeake, Virginia



- Legend**
-  Site Boundaries
  -  Deep Monitoring Well

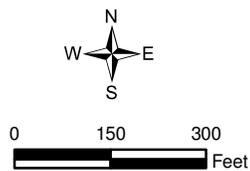


Figure 2  
Monitoring Well Locations  
St. Juliens Creek Annex  
Chesapeake, Virginia

**Attachment**

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Location St Julians Creek Area Date 11/17/09

Project / Client \_\_\_\_\_

Tuesday, Cool, P-Cloudy

Personnel: CHUM Hill Stephen Beard SSC,  
Parrott Woff Kevin White, driver, Malcom  
Bishop helper

0640 NNSY Hall office

0835 Finish getting Drill crew passes,  
did HHS paperwork, signed + reviewed  
HASP + AHAS

0912 On St. J's, Calibrate PID

0 = 0.3ppm 100ppm 150btylene = 109ppm  
SJS21 MW01D TD Well 44' bys0920 Noted water and air coming  
up between 8" casing and 2" casing  
while pumping bentonite slurry.Drillers pump is not pumping well, can  
only mix bentonite to about 1-2 lbs  
bentonite per gallon H<sub>2</sub>O.

1008 Finished pumping bentonite.

1037 Mobilized to SJS02 MW10D TD=  
65.5 ft Setting up to Jackhammer.  
Casing Jackhammered out at 1102  
and cut off below grade ~ 1.5' bys

1103 Mixing bentonite graft.

1208 Finished running bentonite

Location \_\_\_\_\_

Date 11/17/09

Project / Client \_\_\_\_\_

Slurry

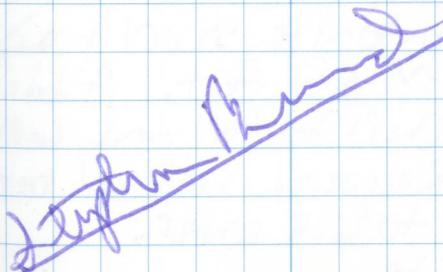
1228 Finished pulling collars,  
put 1 bag bentonite chips at  
surface because needed to fill  
extra volume, backfilled w/  
chips then topsoil.

1229 Left for site 21

1232 Back at SJS21-MW01D  
slurry about 1 to 1.5' down,  
topped off. Drillers will leave  
2 bags cold patch asphalt, 1 bag  
sand, 1 bag bentonite chips.

1253 Left site

1330 home

1430 Discussion w/ PM about  
abandonment.

Location St. Julians Creek Annex Date 11/19/09

Project / Client \_\_\_\_\_

Thursday Warm, P-Cloudy  
 Personnel: Stephen Brand, CHAM Hill  
 1030 leave for St. J's  
 1106 at St. J's Creek Annex.  
 SJS21-MW10D topped off w/ 2.5 feet  
 chip bentonite, Replaced J Plug w/  
 slip cap and covered abandoned  
 well w/ sand (Filter pack sand  
 left by drillers).

Installed 1-inch layer of Cold  
 Patch asphalt and compacted w/  
 4X4. Added second layer 1-inch  
 cold patch asphalt + compacted w/  
 4X4.

1217 Finished patch and left  
 for southern well

1244 SJS02 MW10D Excavated to  
 well, bentonite slurry had dropped  
 or settled ~ 3.5 feet. Added  
 bentonite chips to top and capped w/  
 J-Plug. Recovered well w/ bentonite  
 chips and tologic cover.

1247 left site

1324 office

1420 Sent in SWD for St. J's Creek Annex. <sup>10</sup>

Location \_\_\_\_\_ Date \_\_\_\_\_

Project / Client \_\_\_\_\_

