DEPARTMENT OF THE ARMY
CAMP STANLEY STORAGE ACTIVITY, MCAAP
25800 RALPH FAIR ROAD, BOERNE, TX 78015-4800

December 8, 2015

U-017-16

Via US Mail

SUBJECT: Notification of Plugging and Abandonment of Inactive Wells CS-9 (TCEQ ID G0150117B) and CS-11 (TCEQ ID G0150117D) at Camp Stanley Storage Activity - Public Water System ID No 0150117; RN 100662840
Bexar County, Texas

Public Water Supply Division
Texas Commission on Environmental Quality
Water Supply Division, Building F, 3rd Floor
MC -159
P.O. Box 13087
Austin, Texas 78711-3087

Dear Madam/Sir,

Camp Stanley Storage Activity (CSSA), located in Boerne, TX, is a federal facility operated by the United States Army. This Technical Memorandum summarizes and documents well plugging efforts for two inactive public water supply (PWS) wells located at CSSA. These wells were deactivated from service due to water quality issues, and are no longer needed for PWS production.

PROJECT BACKGROUND AND OBJECTVES

CS-9 and CS-11 are located on the west margin of CSSA in the vicinity of the water storage reservoir (see **Figure 1**). The wells are cased, open borehole wells that produce groundwater from the Middle Trinity aquifer. While their installation dates are not definitive, they date back to circa 1918 according to historical water supply reports. In conjunction with other camp wells, CS-11 and CS-9 served the CSSA PWS system until 1999 and 2006, respectively.

In the 1990s, CS-11 developed a bacteriological contamination issue. Several attempts to disinfect and re-develop the well were made over that decade, but no solution resulted in permanent remedial effectiveness. In June 1999, well CS-11 was permanently suspended from service. The pumping equipment was removed, and the distribution segment to the disinfection plant (Entry Point 002) was capped and abandoned in place.

In May 2006, a well rehabilitation project was undertaken at well CS-9 to remove the original steel casing that was 21 feet in length, and replace it with new steel casing to a depth of 180 feet below grade. The project also attempted to deepen the well; however, legacy pumping equipment (column pipe) was encountered at a depth of 553 feet. The relict piping could not be retrieved, so it was encapsulated in neat Portland cement.

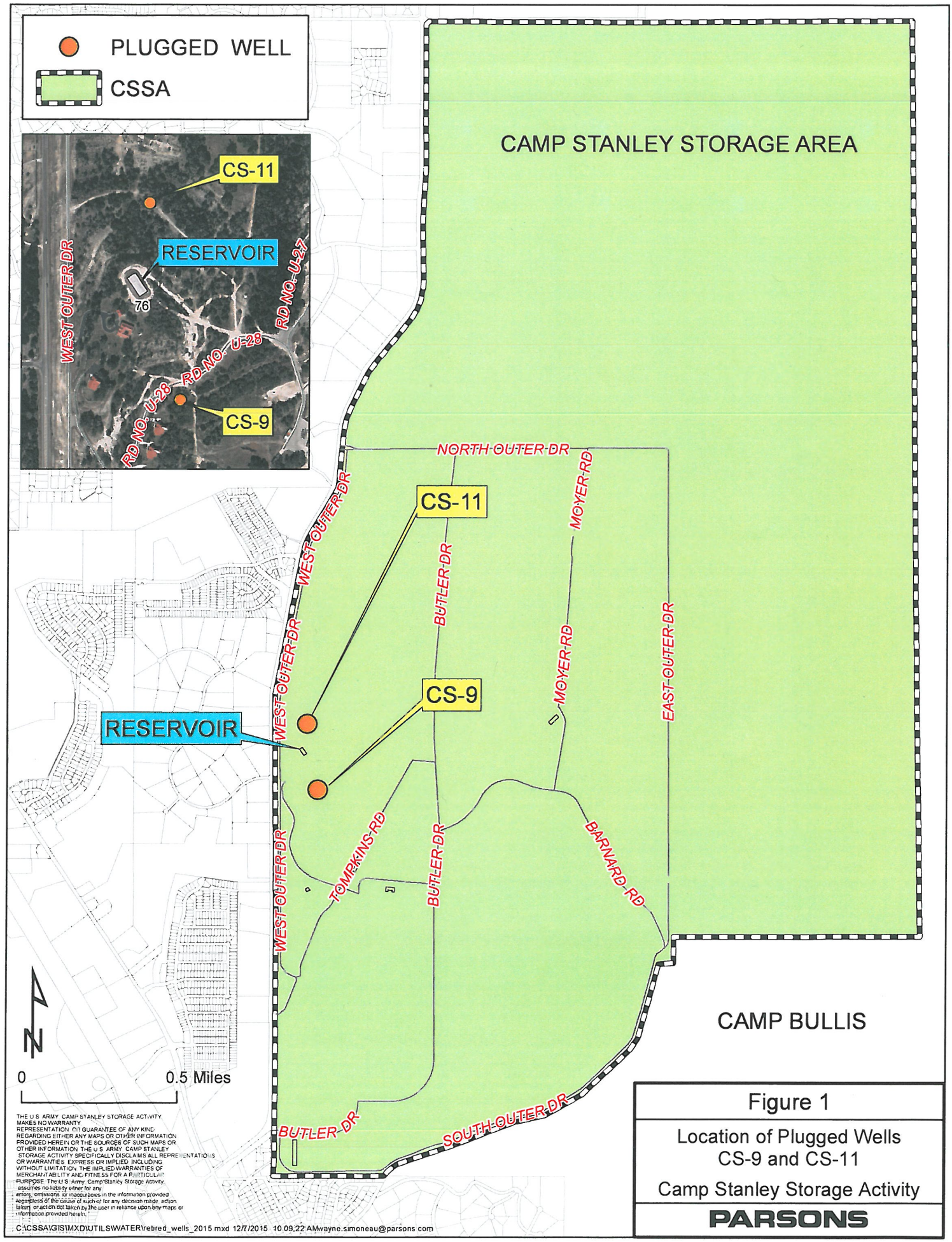

Figure 1

Location of Plugged Wells CS-9 and CS-11

Camp Stanley Storage Activity

PARSONS

The well was disinfected and re-developed following the rehabilitation activities. However, since that time, CS-9 showed elevated levels of lead above the action level of 0.015 milligrams per liter (mg/L) and mercury above the Maximum Contaminant Level (MCL) of 0.002 mg/L. Several attempts to re-develop the well were undertaken, but the metals concentrations could not be permanently abated. The use of CS-9 as a PWS supply well was suspended in 2006, and the well was officially inactivated from the PWS system in 2008.

In 2015, the U.S. Government obtained the funding to permanently abandon the wells.

TECHNICAL APPROACH

The plugging and abandoning of CSSA wells CS-9 and CS-11 followed all applicable state regulations as provided in the Texas Administrative Code (TAC) standards for the capping and plugging of wells (TAC §76.104). In accordance with the regulation, the pumping and wellhead equipment was removed, and the entire well was pressure filled via a tremie pipe with cement from bottom up to the land surface. In addition, the CS-9 and CS-11 distribution segments to the disinfection plant (Entry Point 002) were capped and abandoned in place.

By reviewing the well construction, the amount of Portland cement needed to plug both wells was estimated. Past cementing experience at CSSA groundwater wells had demonstrated that 50 percent losses of grout to the formation in the un-cased zones are likely, and were taken into consideration in the planning of the activity.

Estimated Portland Cement Plugging Volumes

	CS-9				CS-11			
Well Construction Details	**Length** *(feet)*	**Borehole Volume** *(feet^3)*	**Presumed 50% Loss to Formation** *(feet^3)*	**Estimated Plugging Volume** *(feet^3)*	**Length** *(feet)*	**Borehole Volume** *(feet^3)*	**Presumed 50% Loss to Formation** *(feet^3)*	**Estimated Plugging Volume** *(feet^3)*
8" Diameter Cased Borehole					378	132		**132**
10" Diameter Cased Borehole	176	96		**96**				
13.75" Diameter Open Borehole	372	384	192	**575**	177	183	91	**274**
Total:	**548**	**480**	**192**	**671**	**555**	**314**	**91**	**406**

WELL PLUGGING FIELD NARRATIVE

The well plugging activities were performed by a licensed well service contractor (Geoprojects International, Inc. [GPI]) as a subcontractor for Parsons. The well abandonment activities took place between August 28 and September 9, 2015.

The work began with the removal of all production equipment; including pump, column pipe, gauging tubes, conduit, wiring, and motor control panel from CS-9. Then a tremie pipe was installed at each location to the bottom of the well. As a subcontractor to GPI, Grey Rock Pressure Pumping, LLC mobilized a pumping truck, batch truck, and water truck to the site, and mixed and continuously pressure-cemented the estimated volumes of neat Portland cement as shown in the above table. The density of the mixed cement was measured as 13.7 pounds per gallon. The tremie pipe was slowly extracted as cement was pumped into the borehole, while keeping the pipe discharge below the cement interface. As expected, there was an appreciable amount of loss of cement to the bedrock formation in the uncased portions of the borehole. Ultimately, 422 sacks (~696 cubic feet) of Portland cement were emplaced in CS-9, which was 45 percent more than the calculated total borehole volume. Likewise, 232 sacks (~383 cubic feet) were emplaced into CS-11, which is 22 percent more than the calculated borehole volume. The grout loss in CS-11 was lower because it had 202 feet more surface casing than CS-9. Photographic documentation of the plugging activities is provided in **Attachment 1**. The State of Texas Well Plugging Reports are included as **Attachment 2**.

At each well, the casing stick-up was cut flush with the ground surface and a concrete surface plug with survey marker was added to denote the location of where the well was installed. All pumping equipment, pipe, wire, conduit, panels, and refuse were managed at an approved disposal or recycling facility. Well plugging reports were then submitted to the Texas Commission on Environmental Quality (TCEQ). After the distribution lines were capped and abandoned in place, the metering pit at CS-11 was filled to grade with clean, imported fill. The well abandonment activities concluded on September 9, 2015.

SUMMARY

Wells CS-9 (TCEQ ID G0150117B) and CS-11 (TCEQ ID G0150117D) have been abandoned in accordance with the regulations of the State of Texas, and no longer serve the CSSA PWS system. We ask that TCEQ update their records and the Texas Drinking Water Watch system with this newest information. Please be advised that Entry Point 002 is still active for well CS-10 (TCEQ ID G0150117C). If you have any questions concerning this letter or the abandonment activities, please contact me at (210) 295-7067.

Sincerely,

Felicia Kraintz
Environmental Program Manager

Enclosures

cc: Mr. Greg Lyssy, EPA Region 6
Ms. Amanda Pirani, TCEQ Central Office
Mr. Jorge Salazar, TCEQ Region 13
Ms. Julie Burdey, Parsons

ATTACHMENT 1

Photographic Documentation

Removing wellhead plumbing and distribution connection at CS-9

Removing pumping equipment from CS-9

Mixing cement for emplacement within CS-9

Pumping cement via tremie pipe into CS-9

Mixing cement at CS-11

Pumping cement via tremie pipe at CS-11

ATTACHMENT 2

State of Texas Plugging Reports
CS-9 & CS-11

STATE OF TEXAS PLUGGING REPORT for Tracking #152128

Owner:	**Camp Stanley Storage Activity**	Owner Well #:	**CS-9**
Address:	**28500 Ralph Fair Road Boerne, TX 78015**	Grid #:	**68-20-4**
Well Location:	**28500 Ralph Fair Road Boerne, TX 78015**	Latitude:	**29° 41' 19" N**
		Longitude:	**098° 36' 09" W**
Well County:	**Bexar**	Elevation:	**No Data**

Well Type: **Public Supply**

Drilling Information

Company: **No Data** Date Drilled: **No Data**

Driller: **No Data** License Number: **Unknown**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**13.75**	**0**	**372**
	12.25	**372**	**548**

Plugging Information

Date Plugged: **9/9/2015** Plugger: **Geoprojects**

Plug Method: **Tremmie pipe cement from bottom to top**

Casing Left in Well:

Dia (in.)	*Top (ft.)*	*Bottom (ft.)*
10	**0**	**176**

Plug(s) Placed in Well:

Top (ft.)	*Bottom (ft.)*	*Description (number of sacks & material)*
0	**548**	**Cement 422 Bags/Sacks**

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **Geoprojects International, Inc**
8834 Circle Drive
Austin, TX 78736

Driller Name: **Lee F. Gebbert** License Number: **2525**

Comments: **No Data**

STATE OF TEXAS PLUGGING REPORT for Tracking #152130

Owner:	**Camp Stanley Storage Acivity**	Owner Well #:	**CS-11**
Address:	**25800 Ralph Fair Road Boerne, TX 78015**	Grid #:	**68-20-4**
Well Location:	**25800 Ralph Fair Road Boerne, TX 78015**	Latitude:	**29° 41' 19" N**
		Longitude:	**098° 36' 09" W**
Well County:	**Bexar**	Elevation:	**No Data**

Well Type: **Public Supply**

Drilling Information

Company:	**No Data**	Date Drilled:	**No Data**
Driller:	**No Data**	License Number:	**Unknown**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**13.75**	**0**	**555**

Plugging Information

Date Plugged: **9/9/2015** Plugger: **Geoprojects**

Plug Method: **Tremmie pipe cement from bottom to top**

Casing Left in Well:

Dia (in.)	*Top (ft.)*	*Bottom (ft.)*
10	**0**	**378**

Plug(s) Placed in Well:

Top (ft.)	*Bottom (ft.)*	*Description (number of sacks & material)*
0	**555**	**Cement 232 Bags/Sacks**

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **Geoprojects International, Inc**

8834 Circle Drive
Austin, TX 78736

Driller Name: **Lee F. Gebbert** License Number: **2525**

Comments: **No Data**