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NAS CECIL FIELD, FL
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STORM SEWER INVESTIGATION LETTER REPORT FOR OPERABLE UNIT 7 (OU 7) SITE 16 NAS CECIL FIELD FL

12/9/1998

TETRA TECH NUS INC

Submitted
12/9/98
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STORM SEWER INVESTIGATION
LETTER REPORT
OPERABLE UNIT 7, SITE 16
NAVAL AIR STATION CECIL FIELD

INTRODUCTION

This letter report summarized the results of a storm sewer investigation that was conducted at the Naval Air Station (NAS) Cecil Field, Operable Unit 7, Site 16. The inspection was conducted on August 27, 1998 by Tetra Tech NUS, Inc. (TtNUS) personnel. The objective of the storm sewer inspection was to identify and record any groundwater infiltration or anomalies in the storm sewer system within the approximate area of the trichloroethene (TCE) groundwater plume.

A site plan that illustrates the storm sewer system and TCE contaminant plume near Site 16 is provided on Figure 1-1. The storm sewer system was visually inspected from manhole CF-STM2-6 near Building 313 to manhole CF-STM2-3 east of Building 825. All sewer lines inspected were constructed of corrugated metal pipe. The entire investigation was videotaped. A summary of the storm sewer inspection is provided below. For organizational purposes, the summary has been divided into sections corresponding to the order of inspection.

INVESTIGATION SUMMARY

CF-STM2-11 to CF-STM2-3

TtNUS personnel began the inspection at CF-STM2-11 and proceeded east to CF-STM2-3. The diameter of this section of the stormwater culvert is 78 inches. A "soft" area in the bottom of the pipe was discovered approximately 40 feet east of CF-STM2-11. This area consisted of a laceration in the bottom of the pipe that was approximately 1 foot long and 6 inches wide. The pipe was in a degraded condition for approximately 10 feet. A pile of debris consisting of chunks of asphalt and stones was encountered 75 feet east of CF-STM2-11. The debris extended for 2 to 3 feet and completely covered the entire bottom of the pipe. A piece of plywood that measured 2 feet by 3 feet was found 80 feet east of CF-STM2-11. Approximately 100 feet east of CF-STM2-11, the water depth was observed to increase 6 inches. Another laceration in the bottom of the pipe was discovered approximately 120 feet east of CF-STM2-11. This laceration was 1 foot long and extended across the entire pipe bottom. Approximately 15 feet west of CF-STM2-3, the southern side of the pipe was observed to protrude inward toward the north. This indentation was corroded and extended for 5 feet in length. It should be noted that the bottom of CF-

STM2-3 was higher than the pipe invert. This would explain the 6-inch depth increase that caused the ponded water mentioned above.

CF-STM2-11 to CF-STM2-10

Next, the inspection continued at CF-STM2-11 and proceeded west to CF-STM2-10. The diameter of this section of culvert is 78 inches. A 12-foot long piece of lumber was discovered on the bottom of the pipe 15 feet west of CF-STM2-11. Approximately 25 feet west of CF-STM2-11, infiltration was observed on the northern side of the pipe. The water was infiltrating slightly above the existing water line in the culvert. Infiltration was also observed 100 feet west of CF-STM2-11. At this location, water was infiltrating on the southern side of the culvert approximately 1 inch above the existing water line. A pile of debris consisting of gravel and stones was encountered approximately 200 feet west of CF-STM2-11.

CF-STM2-8 to CF-STM2-7 to CF-STM2-6

TtNUS personnel then relocated to CF-STM2-8 to complete the remaining sections of the investigation. The inspection continued at CF-STM2-8 and proceeded north to CF-STM2-7 and CF-STM2-6. The diameter of the culvert from CF-STM2-8 to CF-STM2-6 is 66 inches. Infiltration was encountered 145 feet north of CF-STM2-8. A seam in the culvert appeared to be wet, and water was observed seeping into the pipe. Debris was littered throughout this section. The debris consisted of gravel, chunks of asphalt and stone, partial bricks, and small pieces of wood.

No infiltration was observed from CF-STM2-7 to CF-STM2-6; however, this section was also littered throughout with debris. In contrast, it was noted in the Pilot-Scale Treatability Study Report that a section of pipe approximately three feet in length had been eroded away between CF-STM2-6 and CF-STM2-7. During the previous inspection, groundwater appeared to be infiltrating the storm sewer at this location.

CF-STM2-8 to CF-STM2-9 to CF-STM2-10:

The final run investigated began at CF-STM2-8 and extended to CF-STM2-10. The diameter of the culvert from CF-STM2-8 to CF-STM2-9 is 66 inches, and it increases to a diameter of 78 inches from CF-STM2-9 to CF-STM2-10. A large pile of debris was encountered 5 feet south of CF-STM2-8 and extended for 5 feet toward CF-STM2-9. The debris consisted of gravel, chunks of asphalt and stone, partial bricks, and small pieces of wood. Approximately 30 feet south of CF-STM2-8, infiltration was encountered in the form of a wet seam on both the east and west sides of the culvert. Water was observed to be seeping into the pipe.

The direction of the storm sewer system changed 90 degrees to the east from CF-STM2-9 to CF-STM2-10. Approximately 40 feet east of CF-STM2-9, a hollow section in the pipe was discovered on the northern side of the culvert. Another large pile of debris was encountered 45 feet east of CF-STM2-9. The debris consisted of the same material discussed above and extended for 15 feet. Infiltration was observed approximately 60 feet east of CF-STM2-9. The culvert seam on both the northern and southern sides appeared to have water seeping into the pipe. For the remaining section of pipe (approximately 140 feet) to CF-STM2-10, infiltration was observed at each seam on both the northern and southern sides of the culvert.

CONCLUSIONS AND RECOMMENDATIONS

Following the sewer inspection, groundwater elevations were compared to pipe elevations to confirm that the sewer line was below the water table. Sewer invert elevations range from approximately 60 feet msl at CF-STM2-6, the farthest upstream location, to 57 feet msl at CF-STM2-3, the farthest downstream location. The elevations at the top of the pipe range from approximately 64 to 65 feet (the pipe diameter increases at location CF-CF-STM2-9). The ground surface elevation near Building 313 is approximately 78 feet msl. The depth to the water table in this area has ranged from approximately 6 to 7 feet, depending on the season and the particular monitoring well. Therefore, the water table elevation is approximately 71 to 72 feet msl and is, therefore, located above the top of the sewer pipe.

A review of TCE concentrations from water samples previously collected at various locations in the sewer system was also conducted. With one exception, the concentrations decrease with downstream distance. This indicates that the concentration is being diluted. The TCE concentrations measured upstream of each manhole/catch basin during the latest sampling event (April 1998) are summarized below:

- CF-STM2-7: 180 µg/L
- CF-STM2-8: 140 µg/L
- CF-STM2-9: 130 µg/L
- CF-STM2-10: 54 µg/L
- CF-STM2-11: 68 µg/L
- CF-STM2-3 60 µg/L
- CF-STM2-4: 20 µg/L

CF-STM2-6 to CF-STM2-7

Relining of this section of the storm sewer is recommended. Samples should be collected to evaluate the effectiveness of this action. If the TCE concentration remains above the action level, then relining of additional pipe segments should be considered. This section of the sewer had the highest TCE concentration (180 µg/L); however, infiltration was not observed during the August 1998 inspection. In contrast, it was noted in the Pilot-Scale Treatability Study Report that a pipe section approximately 3 feet long had been eroded away. Historical analytical data were reviewed to determine whether the source of the TCE was upgradient of CF-STM2-6; however, TCE was not detected at CF-STM2-5 or CF-STM2-6 in samples collected in 1994.

CF-STM2-7 to CF-STM2-8

No action is recommended for this section of the sewer. Although one area of infiltration was observed, the location is outside the approximate extent of the TCE groundwater plume. In addition, the TCE concentration was diluted and decreased from 180 µg/L to 140 µg/L.

CF-STM2-8 to CF-STM2-9

No action is recommended for this section of the sewer. Although one area of infiltration was observed, the location is outside the approximate extent of the TCE groundwater plume. In addition, the TCE concentration was diluted and decreased from 140 µg/L to 130 µg/L.

CF-STM2-9 to CF-STM2-10

No action is recommended for this section of the sewer. Although infiltration was observed in much of the sewer, the location is outside the approximate extent of the TCE groundwater plume. In addition, the TCE concentration was diluted and decreased from 130 µg/L to 54 µg/L.

CF-STM2-11 to CF-STM2-10

No action is recommended for this section of the sewer at this time. Two areas of infiltration were observed, and the TCE concentration increased from 54 µg/L to 68 µg/L. Although a portion of this pipe is within the TCE groundwater plume, the increase could also be caused by inflow from the sewer pipe north of CF-STM2-10. No samples have been collected from this pipe to confirm this potential cause of the increase in TCE concentrations.

CF-STM2-11 to CF-STM2-3

No action is recommended for this section of the sewer. Although lacerations and a "soft" area were discovered, infiltration could not be clearly observed because these areas were underwater on the bottom of the pipe. TCE was detected; however, the concentrations decreased from 68 µg/L to 60 µg/L.

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CEF-16-5S
CEF-16-11DD
CEF-16-12I
CEF-16-9D
CEF-16-10S
CEF-16-7S
CEF-16-19S
CEF-16-20D
CF-STM2-5
CF-STM2-6
CF-STM2-7
CF-STM2-8
CF-STM2-9
CF-STM2-10
CEF-16-23D
CEF-16-22I
CEF-16-21S
CEF-16-26DD
CEF-16-25D
CEF-16-24S
CEF-16-30D
CEF-16-29S
CEF-16-31DD
CEF-16-27I
CEF-16-28D
CF-STM 2-11
CF-STM2-3
CEF-16-34DD
CEF-16-33D
CEF-16-32S

815
313
241
825

12"
10"
66"
78"
16"
15"

N

LEGEND

STM 2-7	CATCH BASIN OR MANHOLE
— —	APPROXIMATE EXTENT OF TCE PLUME IN GROUNDWATER
//////	STORM SEWER SUSPECTED TO BE RECEIVING CONTAMINATED GROUNDWATER
———	STORM SEWER INSPECTED
⊕	MONITORING WELL
■	MANHOLE OR CATCH BASIN

NOTE:
PLUME OBTAINED FROM RI (ABB, JULY, 1995)

0 100 200
SCALE IN FEET

DRAWN BY EP	DATE 8/19/98	TCE CONTAMINANT PLUME AND STORM SEWER SYSTEM OU7 SITE 16 NAS CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NO. 7792
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHED–AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 1–1 REV. 0

FORM CADD NO. SDV_BV12.DWG - REV 0 - 1/20/98

EU012