

6 FEB 01 "AS OF"

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### CHRONOLOGY OF EVENTS:

- 1972 Holcomb Boulevard Water Treatment Plant and Distribution System become operational. Water to Paradise Point, Berkeley Manor, Watkins Village and Midway Park Family Housing Areas now comes from Holcomb Boulevard System. Prior to 1972 these areas were served by the Hadnot Point System.
- 1977 All eight water supply systems aboard the Base are tested (Courthouse Bay, Rifle Range, Onslow Beach, Hadnot Point, Holcomb Blvd., Tarawa Terrace, Montford Point, and New River) for herbicides and some chlorinated hydrocarbons (not specifically trichloroethylene (TCE) or perchloroethylene (PCE)). The detection limit was established at 1 ppb for the herbicide and chlorinated hydrocarbon analysis. There were no detections of TCE or PCE.
- Apr 79 Study of Tarawa Terrace (TT) and Montford Point Water Treatment Plant recommended demolishing plants due to age, expanding Holcomb Blvd. water treatment plant and running water line to TT and Camp Johnson. Base submits MILCON project to demolish TT and Montford Point water treatment plants.
- 26 Nov 79 Suggested No Adverse Reaction Level (SNARL) published in Federal Register for TCE.
- 29 Nov 79 EPA publishes final regulations for the control of trihalomethanes ("THM") as an amendment to the National Primary Drinking Water Standards. For water treatment systems serving between 10,000 and 75,000 people, mandatory monitoring was required to begin by 29 November 1980 and compliance with the new standard was to be achieved by 29 November 1983.
- 10 Feb 80 SNARL published in Federal Register for PCE.
- 1980-81 Sampling for Trihalomethanes ("THM") done on 21 Oct 80; 18 Dec 80; 29 Jan 81; 26 Feb 81; 9 Mar 81; 14 Apr 81; 11 Jun 81. The samples from 21 Oct 80; 18 Dec 80; 29 Jan 81; 26 Feb 81; 9 Mar 81 reflect chlorinated hydrocarbons in the sampled water, which interfered with THM sampling in Hadnot Point. The samples taken on 14 Apr 81 and 11 Jun 81 do not reflect any further chlorinated hydrocarbon interference.
- Jun 80 In response to the Defense Environmental Quality Program Policy Memorandum (DEQPPM) 80-6, the Department of the Navy developed the Naval Assessment and Control of Institutional Pollutants (NACIP)

Program in January of 1981. The purpose of this program was to identify, investigate, assess, characterize, and clean up or control releases of hazardous substances, and to reduce the risk to human health and the environment from past waste disposal operations and hazardous material spills at Navy/Marine Corps activities.

- 1982-83 MILCON project approved to expand the Holcomb Blvd. water treatment plant and demolish the TT water treatment plant.
- Jan 82 NACIP Initial Assessment Study ("IAS") begins at Camp Lejeune. The intent of this study is to identify areas of environmental concern, including water contamination.
- Feb 82 MCAS New River is marginally above THM limits based on 1980 study. All other systems are within standards.
- Feb 82 Camp Lejeune is notified that the NACIP IAS team will visit Camp Lejeune in March 1982.
- Apr 82 Camp Lejeune samples all eight water systems for THMs. Hadnot Point and MCAS New River were required to be tested, while testing of the other water systems was voluntary. Five samples were taken from the TT system and all tested normal for THMs. Five samples were also taken from the Hadnot Point systems and were all found exceeding the established criteria for trihalomethanes. There was no indication of PCE or TCE contamination in any of the samples.
- 6 May 82 Camp Lejeune is informed that solvents in the water, specifically TCE and PCE, hindered THM analysis in two water treatment systems, Tarawa Terrace and Hadnot Point.
- May 82 Hadnot Point water system samples indicate PCE = 15 parts per billion (ppb) and TCE = 1400 ppb. TT water system samples indicate PCE = 80 ppb. (See Jun '82 comment below.)
- Jun 82 Camp Lejeune is informed that the May '82 samples were unreliable because of poor duplication resulting from faulty sample containers and cap liners.
- 24 Jun 82 THM testing occurred at the TT, Hadnot Point and Holcomb Blvd. water treatment plants.
- 28 Jun 82 Tests reveal that all base systems are in compliance with the 0.10 milligrams per liter limit for THMs.

- 27 Jul 82 Water distribution system in TT was tested. Results showed: Influent (raw water) PCE = 76 ppb and effluent (treated water) PCE = 82 ppb.
- 27 Jul 82 Water distribution system in TT was tested again at Bldg. TT-2453. Results reflected PCE = 104 ppb.
- 27 Jul 82 Hadnot Point distribution system was tested. Influent: PCE = <1 ppb, TCE = 19 ppb. Effluent: PCE = <1 ppb, TCE = 21 ppb. The system was also sampled at Bldg. FC-530: PCE = 100 ppb, TCE = no data (approximated between 19-21 ppb).
- 28 Jul 82 THM sampling was conducted at TT and Hadnot Point. Two extra samples were taken from TT and HP to be tested for TCE, PCE and other solvents.
- Aug 82 Trihalomethane sampling conducted monthly from April through July did not show any THM problems in the Hadnot Point, TT, Montford Point, Holcomb Blvd., Courthouse Bay, or Onslow Beach systems. These systems were reduced to quarterly sampling. The New River and Rifle Range systems continued to be sampled monthly.
- Aug 82 Camp Lejeune officials were not certain whether VOCs were coming from pipes, treatment plants, or from groundwater wells. Additionally, there was concern over the accuracy of the VOC findings. Camp Lejeune remained in contact with the State of North Carolina Water Quality Control regarding the findings of VOCs at Hadnot Point and Tarawa Terrace.
- Sep 82 Trihalomethane samples for July and August indicate compliance with trihalomethane regulations. No indication of VOC interference.
- Sep 82 Contract awarded to replace water laterals in TT.
- Nov 82 Inorganic analysis of water treatment plants indicates none of the maximum contaminant levels were exceeded.
- Dec 82 November trihalomethane sampling of the eight water treatment systems indicated resumption of VOC interferences in the TT and Hadnot Point systems. The levels of PCE and TCE were not indicated in the lab results.
- Jan 83-Jul 84 Base officials determine that they will have the experts from ongoing NACIP Confirmation study investigate the scope and source of VOC contamination.

- Apr 83 IAS for Marine Corps Base, Camp Lejeune is published.
- Sep 83 THM results of quarterly sampling indicated contamination by TCE and PCE in TT and Hadnot Point. The levels of PCE and TCE were not indicated in the lab results.
- Nov 83 Site visit conducted at Camp Lejeune in furtherance of NACIP Confirmation Study.
- Dec 83 Camp Lejeune discontinues THM monitoring for water systems other than Hadnot Point and MCAS New River.
- Jun 84 EPA publishes proposed recommended maximum contaminant levels (RMCL) for TCE and PCE in drinking water and solicits public comment.
- Jul 84 Base wells are sampled for VOCs as part of the NACIP Confirmation Study in areas where chemicals were suspected to have leaked. Samples were analyzed for potential contaminants and verified.
- 30 Nov 84 After NACIP results are received at Camp Lejeune, Hadnot Point water treatment plant well 602 was tested and found to contain: TCE = 1,600 ppb, Trans 1,2-DCE = 630 ppb, Benzene = 121 ppb, and 1,1,2,2-TCA = 24 ppb. Well 602 was shut down on 30 Nov 84.
- 4 Dec 84 Hadnot Point wells 601, 603, 608, 634, and 637 were tested. Results indicate: well 601: TCE = 207 ppb, trans 1,2-DCE = 88 ppb; well 603: TCE = 4.6 ppb; well 608: TCE = 110 ppb, trans 1,2-DCE = 5.4 ppb. Wells 634 and 637 reflected no contamination. The raw and treated water was tested at the water treatment plant. Results indicate the influent had: TCE = 46 ppb, trans 1,2-DCE = 15 ppb, chloroform = 10 ppb, and bromodichloromethane = 6 ppb. The effluent had: TCE = 196 ppb, trans 1,2-DCE = 83 ppb, chloroform = 16 ppb, and bromodichloromethane = 10 ppb. No 1,1,2,2-PCA was detected in either the raw or treated water.
- 6 Dec 84 Hadnot Point wells 601 and 608 were shut down
- 10 Dec 84 Hadnot Point wells 601, 602, 603, 608, 634, and 637 were tested. Results indicated: well 601: PCE = 4.4 ppb, TCE = 230 ppb, trans 1,2-DCE = 99 ppb, methylene chloride = 10 ppb; well 602: TCE = 540 ppb, trans 1,2-DEC = 380 ppb, Benzene = 720 ppb; well 603: TCE = non-detect, methylene chloride = 7 ppb; well 608: TCE = 13 ppb, trans 1,2-DCE = 2.4 ppb, methylene chloride = 14 ppb, and benzene = 4 ppb. Wells 634 and 637 reflected methylene chloride contamination at 130 ppb and 275 ppb,

respectively. The treated water was then tested at the water treatment plant. Results indicated the effluent had: TCE = 2.3 ppb, trans 1,2-DCE = 2.3 ppb, and chloroform = 30 ppb.

13 Dec 84 Hadnot Point well 602 was sampled again. Results exhibited: TCE = 340 ppb, trans 1,2-DCE = 230 ppb, benzene = 230 ppb, and toluene = 12 ppb.

13-19 Dec 84 The raw water at the Hadnot Point plant was tested daily.

14 Dec 84 Hadnot Point wells 634 and 637 were shut down.

Jan 85 Contract awarded to demolish TT water treatment plant and expand the Holcomb Blvd. plant.

Jan 85 Monitoring for VOCs commenced at all Hadnot Point and Tarawa Terrace wells. Decision is made by Camp Lejeune to test all drinking water wells on Base for VOCs.

16 Jan 85 Wells TT-26 and TT-23 were sampled.

27 Jan 85 A generator fuel line at the Holcomb Boulevard water distribution plant leaked fuel into the water system. The system was immediately shut down and flushed out. Emergency back up water was pumped from the Hadnot Point system into the Holcomb Blvd. water distribution system.

31 Jan 85 Tap water samples taken from Berkeley Manor Elementary School (which, because of the fuel leak, was temporarily receiving water from the Hadnot Point Plant) contained TCE at 1,148 ppb and 1,2-DCE at 407 ppb. These findings were consistent with samples taken from the Hadnot Point plant on the same day indicating the contamination originated from the emergency water supplied by the Hadnot Point Plant. Water from the clean Holcomb Blvd. system was restored approximately 5 days later.

4 Feb 85 January samples revealed that Well 651 in Hadnot Point had PCE and TCE contamination: PCE = 400 ppb, TCE = 18,900 ppb, and DCE = 8070 ppb. Well 651 was immediately taken off line. All VOC contaminated wells in the Hadnot Point system are now out of operation. VOC 27, 370 ppb

4 Feb 85 Holcomb Blvd and Hadnot Point plants and water distribution systems are flushed and Holcomb Blvd Water Treatment Plant is put back on line.

5 Feb 85 Tap water in TT is tested again. Results reflect PCE = 215 ppb, TCE = 8.1 ppb, and DCE = 12 ppb.

- Feb 85 Results from Jan 85 sampling of Wells TT-26 and TT-23 were received and indicated: TT-26: PCE = 1,580 ppb, TCE = 57 ppb, DCE = 92 ppb and vinyl chloride = 27 ppb. TT-23: PCE = 132 ppb, DCE = 11 ppb, no TCE or vinyl chloride was detected. 23  
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- 8 Feb 85 TT wells TT-23 (new well) and TT-26 are shut down. All contaminated wells in TT are now offline.
- 12 Feb 85 Finished water from the TT distribution system was tested and determined to contain no VOCs.
- 19 Feb 85 Water from the TT distribution system was tested again and was determined to contain no VOCs. Each of the nine TT wells was also tested. No contaminants were detected in TT-25, TT-30, TT-31, TT-52, TT-53, TT-54, or TT-67. TT-26 showed: PCE = 1580 ppb, TCE = 57 ppb, DCE = 92 ppb, and vinyl chloride = 27 ppb. TT-23 (new well) reflected: PCE = 41 ppb, TCE = non-detect, DCE = 13 ppb, no vinyl chloride was found. 23X  
25✓  
30✓  
31✓  
52✓  
53✓  
67✓  
26X
- 21 Feb 85 State of North Carolina analysis of TT-26 and TT New Well (TT-23) (both of which were offline) indicated: TT-26: PCE = 3.91 ppb, TCE = 55.17 ppb, trans 1,2-DCE = trace. TT-23: PCE = 26.17 ppb, TCE = 53.53 ppb, trans 1,2-DCE = trace. 23  
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- Mar 85 In order to compensate for water shortages caused by well closures in TT, Camp Lejeune prepares to construct an 8" auxiliary water line from the Holcomb Blvd. water treatment plant to TT.
- 11 Mar 85 Camp Lejeune and State of North Carolina conduct split sample of TT finished water after running TT New Well (TT-23) for a 24 hour period. Results indicate PCE = 6.6 ppb (State sample) and 8.9 ppb (Base sample).
- Apr 85 North Carolina Department of Environmental Management begins investigation of ABC Cleaners as a potential source of VOCs in the TT wells.
- 22-29 Apr 85 TT-23 was reopened for three 7 hour cycles to avoid system shutdown. On each occasion, VOC analyses of TT finished water indicated concentrations less than 10 ppb.
- Jun 85 Construction of an emergency auxiliary waterline from Holcomb Blvd. water treatment plant to TT is completed easing the water shortage. Water restrictions in TT are lifted.

- Jul 85 Construction to expand the Holcomb Blvd. water treatment plant from 2 MGD to 5 MGD begins.
- Jul 85 VOC testing conducted at TT and HP Plants; no VOCs detected in treated water.
- Nov 85 Laboratory analyses of TT wells TT-26, TT-23 (New Well), and TT-25, indicated continued contamination in closed wells TT-26 and TT-23. Active well TT-25 exhibited trace amounts of PCE (<1 ppb). No VOCs were detected in the finished water from the TT water treatment plant.
- Mar 87 Construction complete on Holcomb Blvd. water treatment plant expansion. TT water treatment plant and wells are permanently closed. All TT finished water is now provided by Holcomb Blvd water treatment plant.
- May 87 Site Inspection Report completed by the State of North Carolina on ABC One Hour Cleaners. From the study, the State was able to conclude that ABC One Hour Cleaners was the source of PCE contamination to groundwater in TT.
- Jul 87 EPA publishes final rule establishing maximum contaminant levels for TCE, and monitoring requirements for PCE. Monitoring requirements for TCE and PCE become effective on January 1, 1988.