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DEPARTMENT OF THE NAVY  
ATLANTIC DIVISION  
NAVAL FACILITIES ENGINEERING COMMAND  
NORFOLK, VIRGINIA 23511

TELEPHONE NO.  
444-9558  
AUTOVON 690-9558  
IN REPLY REFER TO:  
114:WLC

1 2 FEB 1982

From: Commander, Atlantic Division, Naval Facilities Engineering Command  
To: Commanding General, Marine Corps Base, Camp LeJeune

Subj: Data Analysis of MCB CAMP LEJEUNE total Trihalomethane Monitoring Program

Ref: (a) 40 CFR Part 141, Federal Register, Vol. 44 of 29 Nov 1979  
(b) LANTNAVFACENGCOM ltr 114:WLC 6280 of 29 Jul 1980  
(c) LANTNAVFACENGCOM ltr 114:WLC 6280 of 5 Feb 1982  
(d) LANTNAVFACENGCOM ltr 114:WLC 6280 of 26 Aug 1981  
(e) CG MCB CAMP LEJEUNE 092007Z Feb 82

Encl: (1) MCB CAMP LEJEUNE TTHM DATA BASE SUMMARY - Hadnot Point, MCAS  
New River and Rifle Range Potable Water Systems  
(2) Corrective Measures to Prevent/Reduce TTHM Formation

1. As an amendment to the National Primary Drinking Water Standards, reference (a) published final regulations for the control of total Trihalomethanes (TTHM's). The regulations establish a maximum contaminant level (MCL) of 0.10 mg/l for TTHM's, including Chloroform, that are introduced into drinking water by the reaction of naturally occurring substances with the chlorine added in water treatment.

2. Reference (b) initiated the monitoring program at the subject Base for development of a TTHM data base prior to the scheduled compliance date. The two objectives of this monitoring program were to determine the extent of the TTHM problem in the MCB CAMP LEJEUNE potable water systems and to allow time for corrective actions to bring systems into compliance with the regulations.

3. At this time, community water systems under LANTNAVFACENGCOM area of cognizance are not in violation of the TTHM regulations. Public water supplies, serving less than 75,000 people but greater than 10,000, do not have to be in compliance until 29 November 1983. Smaller systems serving fewer than 10,000 people do not have to monitor and comply unless the state requires it. However, recognizing that early identification of program areas is pertinent toward attainment of congressional funding for major expenditure, reference (c) requested guidance regarding compliance policies, program implementation and project initiation from the NAVFACENGCOM.

4. Enclosure (1) which summarizes data collected by this Command during the sampling period, October 1980 through December 1981, is forwarded for your information and use. Studies in general have shown ground water sources to

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be below the MCL, and the running annual average concentrations based on monthly monitoring at the Rifle Range and Hadnot Point potable water systems are well within the establish MCL of 0.10 mg/l for TTHM. However, the MCAS NEW RIVER System concentration of 0.11-0.12 mg/l is marginally above the limit. Accordingly, enclosure (2) provides corrective measures to prevent/reduce TTHM formation through modification within the treatment plant(s) pursuant to references (d) and (e).

5. A list of laboratory services available to perform the TTHM monitoring has also been provided, (enclosure (2)). Given considerations to economics, logistics and future laboratory monitoring and certification requirements, it is recommended that the Base initiate contractual arrangement with one of the North Carolina State certified laboratories.

6. Questions and comments regarding this matter may be addressed to Mr. W. Carter, LANINAVFACENGCOM, Code 114, telephone (804) 444-9558 or AUTOVON 690-9558.

*J. R. Bailey*  
J. R. BAILEY  
By direction

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MCB CAMP LEJEUNE TTHM DATA BASE SUMMARY  
(Potable Water Systems)

Activity/ Location	Number of Sampling Period Submissions	TTHM Range (mg/l)*	Source of Supply	Treatment Facility	Effective Monitoring/ Compliance Date
MCB CAMP LEJEUNE, NC**					
- Rifle Range	(4)***	0.06	Groundwater	WTP	State Discretion
- HADNOT POINT	(9)	0.05-0.07	Groundwater	WTP	29 Nov 82/ 29 Dec 83
- MCAS' NEW RIVER	(9)	0.11-0.12	Groundwater	WTP	29 Nov 82/ 29 Nov 83

\*Figures, represent the running annual average concentration based on monthly monitoring. The high and low ranges take into account erroneous data which could have influence results (i.e., non-designated points of entry, samples not analyzed within 14 days of sampling and lack of information due to septum inversion, spillage, contamination, molecular interference and etc.). Instances where there were no change between the high and low TTHM readings are reflected by one range.

\*\*Monthly sampling frequency with six (6) samples collected per sampling period.

\*\*\*Commence TTHM monitoring program during July 1982, per special request (excluding other parts of Base (less than 10K)). This is still an on-going program.

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CORRECTIVE MEASURES TO PREVENT/REDUCE TTHM's FORMATION

I. Existing Scenario at the MCB CAMP LEJEUNE Water Treatment Plants

A. Current Chlorination Practices

1. Prechlorination - to control algae in the water plant(s)
2. Post Chlorination - to attain adequate disinfection

B. Problems associated with Prechlorination

1. Major cause of high TTHM levels in drinking water supplies
2. Once TTHM's are formed, normal water treatment processes will not remove them.

C. Prechlorination Alternatives

1. Shock dosing with chlorine will often control an algae problem, effectively.
2. Modify the point of prechlorine application within the treatment plant.

D. Conclusion

1. Prevent trihalomethanes formation versus removing them later on in the system.

II. Recommendations

A. Monitoring

1. Continue the previous THM's monitoring program at the Hadnot Point, Rifle Range and MCAS, New River systems from four of the same initial collection points. One sample should be taken at a location within the distribution system reflecting the maximum residence time of the water in the system. The remaining samples are to be taken from central portion of the distribution system.

a. Results in enclosure (1) reveal that the Rifle Range system has had no problem meeting the established MCL for TTHM's nor has Hadnot Point for those samples analyzed within the required 14 days sampling period (indicative of the high and low TTHM ranges representing the running annual average concentration). However, should these systems for some reason are unable to maintain their current low levels of TTHM's, proceed with Section II. A.1.b. (1) below.

b. Typical approaches to evaluate the MCAS, New River community water systems are as follows:

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ENCLOSURE (2)

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(1) Discontinue prechlorination and allow the distribution system to flush for two days to remove any chlorine residual. Collect the first set of samples for analysis. Perform periodic microbiological analysis on the distribution water supply to insure that the potable water standards are being maintained at this time.

(2) Modify the point of prechlorination (i.e., repipe the chlorine lines to prechlorinate prior to filtration).

(3) Monitor and evaluate; if further TTHM's reduction is required, investigate individual raw water sources (i.e., identify the level of TTHM's formation in each step of the water treatment plant and/or if possible, consider closing down wells with high precursors.

Note: Rules governing Public Water Supplies Section .0600 through .2500 of the North Carolina Administrative Code require submission of all reports, plans and specifications to the Sanitary Engineering Section, Division of Health Services at least 30 days prior to any permanent change (e.g., permanent use of repiping for chlorination, installation of aeration or carbon treatment equipment) to the water treatment system(s).

(4) Monitor and evaluate; and if further TTHM's reduction is required, investigate aeration.

(5) Monitor and evaluate; and if further TTHM's reduction is required, investigate carbon treatment water systems:

2. Initiate monitoring programs for TTHM's at the Montford Point, Holcomb Boulevard, Tarawa Terrace, Courthouse Bay and Onslow Beach community water systems:

a. Collect four (4) samples per month taken on the same day from each distribution system, commencing in March 1982 for at least four months.

b. One sample should be taken at a location within the distribution system reflecting the maximum residence time of the water in the system. The remaining samples are to be taken from the central portion of the distribution system.

c. Collect the first set of monthly samples, under normal operating conditions (i.e., including prechlorination, if being provided).

3. Typical approach should any of the above systems exceed 0.10 mg/l for TTHM's during the following months:

a. Discontinue prechlorination and allow the distribution system to flush for two days to remove any chlorine residual. Collect the

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second set of samples for analysis. Perform periodic microbiological on the distribution water supply to insure that the potable water standards are being maintained at this time.

b. Modify the point of prechlorination (i.e., repipe the chlorine lines to prechlorinate prior to filtration for the Tarawa Terrace, Courthouse Bay and Holcomb Boulevard Systems). Since the Montford Point and Onslow Beach systems do not prechlorinate their potable water supplies, recommendations for these systems will be made upon obtainment of monitoring results.

c. Monitor and evaluate; if further TTHM's reduction is required, investigate individual raw water sources (i.e., identify the level of TTHM's formation in each step of the water treatment plant and/or if possible, consider closing down wells with high precursors).

Note: Rules governing Public Water Supplies Section .0600 through .2500 of the North Carolina Administrative Code require submission of all reports, plans and specifications to the Sanitary Engineering Section, Division of Health Services at least 30 days prior to any permanent change (e.g. permanent use of repiping for chlorination, installation of aeration or carbon treatment equipment) to the water treatment system(s).

d. Monitor and evaluate; if further TTHM's reduction is required, investigate aeration.

e. Monitor and evaluate; if further TTHM's reduction are required, investigate carbon treatment.

### III. Laboratory Services

#### A. North Carolina State Certified Labs

1. Grainger Laboratories  
709 West Johnson Street  
Raleigh, NC 27603  
Phone: (919) 828-3360  
Costs: \$35/sample (Note: Approximately 15% discount on 8 or more samples submitted at the same time. Call for proposal/verification on costs)
2. Law & Company  
P. O. Box 629  
Wilmington, NC 28402  
Phone: (919) 762-7082  
Costs: \$35/sample (Note: Approximately 15% discount on 8 or more samples submitted at the same time. Call for proposal/verification on costs).

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B. LANINAVFACENGCOCM Service Contract

1. Jennings Laboratories, Inc.  
1118 Cypress Avenue  
Virginia Beach, VA 23451  
Phone: (804) 425-1498  
Costs: \$60/sample - (No discount; Lab not certified by  
EPA/State for SDWA compliance reporting).

C. Army Laboratory Service

1. Chief, U.S. AEHA (RD-S)  
Attn: Lab Services  
Building 180  
Fort McPherson, GA 30330  
Phone: (AUTOVON 588-3234)  
Costs: Free (Lab is currently gearing down their operation  
on TTHM monitoring. Future monitoring of this type,  
anticipated for Army compliance use, will be performed  
at an AEHA Laboratory in Maryland. Prior to acceptance  
of any additional monitoring responsibility from naval  
activities, an official request by letter must first be  
channeled through the appropriate Navy/Army  
administrative chain of command for consideration).