

# Sampling for Lead in Drinking Water in Priority Areas

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MARINE CORPS INSTALLATIONS EAST-MARINE CORPS BASE CAMP LEJEUNE



29 October 2014

**BUILDING 780 – BREWSTER TEEN CENTER REPORT**

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## **ACRONYMS AND ABBREVIATIONS**

|                    |                                                                   |
|--------------------|-------------------------------------------------------------------|
| AS                 | Marine Corps Air Station New River                                |
| BP                 | Braising pan                                                      |
| BS                 | Bathroom sink with spigot                                         |
| CB                 | Courthouse Bay                                                    |
| CDC                | Child Development Center                                          |
| CS                 | Classroom sink with spigot                                        |
| EPA                | Environmental Protection Agency                                   |
| HB                 | Outside hose bib                                                  |
| HNO <sub>3</sub>   | Nitric acid                                                       |
| HWD                | Hot water dispenser                                               |
| IM                 | Ice machine                                                       |
| IMW                | Ice machine with water dispenser                                  |
| K                  | Kettle                                                            |
| KS                 | Kitchen sink with spigot                                          |
| MCASNR             | Marine Corps Air Station New River                                |
| MCIEAST-MCB CAMLEJ | Marine Corps Installations East-Marine Corps Base<br>Camp Lejeune |
| ml                 | Milliliter                                                        |
| MP                 | Midway Park                                                       |
| NSF                | National Sanitation Foundation                                    |
| OS                 | Other type of sink                                                |
| PP                 | Paradise Point                                                    |
| ppb                | Parts per billion                                                 |
| RIW                | Refrigerator with ice and water dispensers                        |
| SDWA               | Safe Drinking Water Act                                           |
| SH                 | Sink with spray hose or stand-alone spray hose                    |
| SPHB               | Standpipe with hose bib                                           |
| TT                 | Tarawa Terrace                                                    |
| USEPA              | United States Environmental Protection Agency                     |
| USMC               | United States Marine Corps                                        |
| WC                 | Water cooler drinking fountain                                    |
| WF                 | Water fountain                                                    |

## **1.0 BACKGROUND**

### **1.1 INTRODUCTION AND PURPOSE**

The United States Marine Corps (USMC) is committed to protecting the health of all our service members, retirees, civilian staff, and their families by providing safe drinking water. One way the Marine Corps monitors installation drinking water is by testing it for the presence of lead. The Marine Corps chooses to test for lead in priority areas according to U.S. Environmental Protection Agency (EPA) guidelines even though federal law generally does not require this testing.

The purpose of this Lead in Priority Areas sampling effort is to comply with USMC policy memo dated 24 February 2014. This memo requires Marine Corps installations to test for lead in drinking water from water fountains, faucets, and other outlets used primarily by children, as outlined in the US EPA (USEPA) publication *3Ts for Reducing Lead in Drinking Water in Schools: Revised Technical Guidance, October 2006* and *3Ts for Reducing Lead in Drinking Water from Child Care Facilities: Revised Technical Guidance, December 2005* (from here on referred to as USEPA 3Ts). These “priority areas” are defined as outlets in primary and secondary schools, Child Development Centers (CDCs), School Age Centers, and Youth and Teen Centers.

The EPA recommends a two-step sampling process be utilized for identifying lead contamination. First, initial samples are collected to identify outlets in priority areas that are providing water with elevated lead levels. Follow-up samples are taken from outlets initially identified as potential problem locations. Sample results are then compared to determine the potential sources of lead contamination and to determine appropriate corrective actions. Below is a brief explanation as to why lead is a concern in drinking water, followed by a brief description of sampling methodology used, sampling results, and any corrective actions required.

### **1.2 LEAD AND DRINKING WATER**

Lead is a toxic metal that is harmful to human health and has no known beneficial value to the human body. The human body cannot distinguish between lead and calcium, which is a mineral essential for human health. Lead remains in the bloodstream and body organs like muscle or brain. What is not excreted is absorbed into the bones, where it can collect for a lifetime.

Children absorb lead more easily than do adults. Their nervous systems are still developing and thus are more susceptible to the effects of toxic contaminants. Children, particularly ages 6 and younger, are at a higher risk for lead exposure because they have

frequent hand-to-mouth activity and absorb lead more easily than do adults. Lead is also harmful to the developing fetuses of pregnant women.

Lead is distributed through the environment through both natural and man-made means and can get into drinking water in two ways: by being present in the source water, such as coming from contaminated runoff or water pollution and/or through an interaction between the water and plumbing materials containing lead, such as through corrosion. The second is the focus of this water sampling effort.

Most lead enters drinking water after the water leaves the water treatment plant and comes into contact with plumbing materials containing lead. Interior plumbing, lead solder, leaded brass fittings, and various drinking water outlets that contain lead materials are the primary contributors of lead in drinking water. Corrosion is the physical/chemical interaction that occurs between the water and plumbing. The extent to which corrosion occurs contributes to the amount of lead that can be released into the drinking water. Even though the water delivered to your facility meets all federal and state public health standards for lead, you may end up with too much lead in your drinking water because of the plumbing in your facility.

There are actions that you can take to reduce the amount of lead in your drinking water. Below are examples of best management practices that should be followed to prevent exposure to elevated levels of lead:

- Debris, which absorbs lead, can accumulate in faucet aerators. Aerators should be cleaned on a regular basis.
- Hot water will dissolve lead more quickly than cold water and is likely to contain increased lead levels. Use only cold water for drinking, cooking and making baby formula. If hot water is required, it should be taken from the cold water tap and heated on the stove or in a microwave.
- Flush outlets before use for at least 30 seconds if outlet has not been used for six hours or longer.

## 2.0 METHODOLOGY

### 2.1 PRIORITY AREAS

All priority areas aboard Marine Corps Installations East-Marine Corps Base, Camp Lejeune (MCIEAST-MCB CAMLEJ) and Marine Corps Air Station, New River (MCASNR) had to be identified prior to developing a sampling and analysis plan. These “priority areas” are defined as outlets in primary and secondary schools, CDCs, School Age Centers, and Youth and Teen Centers. Priority areas do not include on-base or off-base residences (e.g., Family Child Care Homes) used for child care purposes, out-patient medical centers, or schools that are not owned or managed by the Department of Defense. Since the June 2013 Navy Medicine Enterprise Nursing Procedures Manual mandates the use of sterile water to reconstitute powdered formula and as recommended by Bureau of Medicine and Surgery, hospital pediatric and maternity wards are not included in the priority area definition. Priority areas aboard MCIEAST-MCB CAMLEJ and MCASNR are shown in Table 2-1.

| Facility Name                       | Facility No. | Facility Type |
|-------------------------------------|--------------|---------------|
| Bitz Intermediate School            | 2028         | School        |
| Brewster CDC                        | 631          | CDC           |
| Brewster Teen Center                | 780          | Youth/Teen    |
| Brewster Middle School              | 883          | School        |
| Heroes Elementary School            | PP201        | School        |
| Heroes Manor I CDC                  | PP100        | CDC           |
| Heroes Manor II CDC                 | PP200        | CDC           |
| Johnson Primary School              | 2027         | School        |
| Lejeune High School                 | 835          | School        |
| *Paradise Point Officer’s Club      | 2615         | Kitchen       |
| Stone Street Pavilion Youth Center  | 842          | Youth/Teen    |
| **Midway Park CDC                   | LCH4007      | CDC           |
| **Midway Park CDC                   | LCH4011      | CDC           |
| Midway Park Community Center        | LCH4014      | Youth/Teen    |
| Tarawa Terrace Youth Pavilion       | TT19         | Youth/Teen    |
| Tarawa Terrace II Elementary School | TT84         | School        |
| Tarawa Terrace I CDC                | TT86         | CDC           |
| Tarawa Terrace II CDC               | TT113        | CDC           |
| Courthouse Bay CDC                  | BB353        | CDC           |
| Air Station Youth/Teen Center       | AS612        | Youth/Teen    |
| Air Station CDC                     | AS1000       | CDC           |
| **Air Station CDC                   | AS207        | CDC           |
| Delalio Elementary School           | TC1500       | School        |

\*The Paradise Point Officer’s Club is not considered a priority area by definition. However, since they cater meals to the CDCs MCIEAST-MCB CAMLEJ included them in this sampling effort.

\*\*Buildings are not currently occupied and were not included in this sampling effort. Sampling will be conducted at these facilities prior to occupancy.

## 2.2 FIELD INVESTIGATION

Contractors for MCIEAST-MCB CAMLEJ conducted site visits of the facilities listed in Table 2-1. During these site visits all interior and exterior water outlets were identified, given a fixture number, and were added to facility floor plans. All outlets were evaluated for likelihood of use by contractor observation as well as interviews with appropriate staff members. Outlets deemed to be used primarily by children for consumption were included in this sampling effort. Outlets not identified as primarily used by children for consumption, such as janitorial mop sinks and dish washing sinks in kitchens, were excluded from this effort.

## 2.3 SAMPLE COLLECTION

All drinking water samples were collected in accordance with the USEPA 3Ts guidance. Samples were collected in 250 milliliter (ml) plastic sample bottles which contained nitric acid (HNO<sub>3</sub>) preservative. Sample bottles were provided by Element One, a privately held independent laboratory contracted for analysis.

Samples were collected after the water had been idle in the pipes and plumbing fixtures for at least 8 hours but not more than 18 hours. Since school and childcare facilities are not typically open overnight, allowing the water to remain idle for 8-18 hours showed lead levels that were typical with normal water use patterns at these facilities.

All collected samples were assigned a unique sample identification number to ensure that each sample could be tracked back to one particular outlet. Table 2-3 provides a more detailed look at the sample identification method.

| Table 2-3. Sample Identification   |                                     |                                                    |
|------------------------------------|-------------------------------------|----------------------------------------------------|
| Sample ID No.                      | Identifier Description              | Example                                            |
| <u>AS</u> -612-201H-KS-2-01/22/14  | Specific Base Location              | MCASNR                                             |
| AS- <u>612</u> -201H-KS-2-01/22/14 | Building Number or Abbreviated Name | Building 612                                       |
| AS-612- <u>201H</u> -KS-2-01/22/14 | Room Number                         | Hallway outside Room 201                           |
| AS-612-201H- <u>KS</u> -2-01/22/14 | Water Outlet Type                   | Kitchen Sink                                       |
| AS-612-201H-KS- <u>2</u> -01/22/14 | Sample Number                       | Represents number of fixtures of that type in room |
| AS-612-201H-KS-2- <u>01/22/14</u>  | Date                                | Date that sample was collected                     |

### 3.0 RESULTS AND CORRECTIVE ACTIONS

#### 3.1 WATER TESTING RESULTS

Samples were collected from the Brewster Teen Center on 11 October 2014. Table 3-1 shows the initial sampling results received on 28 October 2014.

USEPA 3Ts guidance recommends that action be taken for samples that exceed 20 parts per billion (ppb).

| Table 3-1. Brewster Teen Center, Bldg. 780 - Initial Sampling Results |                          |                            |                          |
|-----------------------------------------------------------------------|--------------------------|----------------------------|--------------------------|
| Sample ID No.                                                         | Lead Concentration (ppb) | Sample ID No.              | Lead Concentration (ppb) |
| PP-780-FOYER-WC-1-10/11/14                                            | < 3                      | PP-780-PRET-CS-2-10/11/14  | < 3                      |
| PP-780-FOYER-WC-2-10/11/14                                            | < 3                      | PP-780-TOD1-CS-1-10/11/14  | < 3                      |
| PP-780-KIT-IM-1-10/11/14                                              | < 3                      | PP-780-PRES2-CS-1-10/11/14 | < 3                      |
| PP-780-KIT-KS-1-10/11/14                                              | < 3                      | PP-780-TOD2-CS-1-10/11/14  | < 3                      |
| PP-780-KIT-KS-2-10/11/14                                              | < 3                      | PP-780-TOD2-CS-2-10/11/14  | < 3                      |
| PP-780-KIT-KS-3-10/11/14                                              | 4                        | PP-780-RECN-BS-1-10/11/14  | < 3                      |
| PP-780-INFANT-CS-1-10/11/14                                           | 4                        | PP-780-RECN-BS-2-10/11/14  | < 3                      |
| PP-780-PRET-CS-1-10/11/14                                             | < 3                      |                            |                          |

As shown in Table 3-1, 100% of all samples taken contained a lead concentration of 20 ppb or less.

#### 3.2 CORRECTIVE ACTIONS

As outlined in the USEPA 3Ts guidance, only samples that exceed the 20 ppb threshold require any corrective action. At the Brewster Teen Center there were no samples that exceeded the EPA limit. In accordance with MCIEAST-MCB CAMLEJ's Sampling Plan for Baseline Sampling and Testing for Lead in Drinking Water in Priority Areas, any outlet that exceeds 20 ppb is immediately removed from service by notifying facility staff, securing the outlet, posting a sign directing that the outlet not be used, and closing the supply valve at the specific outlet. After the outlet has been secured follow-up sampling procedures can begin to determine the source of the lead contamination. No additional samples were necessary at the Brewster Teen Center.

#### **4.0 NEXT STEPS**

MCIEAST-MCB CAMLEJ will continue to monitor for lead in drinking water in priority areas. In accordance with USMC policy memo dated 24 February 2014, sampling efforts will be conducted when any new priority area facilities are constructed. Outlets will also be sampled at existing priority area facilities when water treatment processes are added or modified in any way that has the potential to increase lead concentrations in drinking water. However, after January 2014, if the contractor of newly-constructed facilities can adequately demonstrate that all materials used in plumbing conform to section 1417 of the Safe Drinking Water Act (SDWA), which requires less than 0.25% lead, then the requirement to test new construction is waived.

Installations are also required to re-test priority areas every five years from the established baseline, or more frequently if required by regulatory agencies.