



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
PUBLIC HEALTH COMMAND-EUROPE
CMR 402
APO AE 09180

MCHB-RE-E

12 July 2016

MEMORANDUM FOR Directorate of Public Works (DPW), U.S. Army Garrison (USAG) Bavaria - Hohenfels Military Community (IMEU-HHF-PW), Unit 28216, APO AE 09173

SUBJECT: Lead and Copper Drinking Water Monitoring, USAG Bavaria-Hohenfels, Fiscal Year 2016

1. The Hohenfels Main community water system at USAG Bavaria required lead and copper drinking water monitoring in fiscal year 2016 and complied with regulatory monitoring requirements and should continue ultimate reduced monitoring.
2. A copy of the report is enclosed. We are interested in your comments and suggestions for improving the usefulness of the information and recommendations provided in this report. If you have any comments, or if this report does not meet your needs or expectations, please contact the undersigned at DSN 314-590-9802 or CIV 06371-9464-9802.

FOR THE COMMANDER:

Encl
as

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Public Health Command Europe - CMR 402, APO AE 09180



USAG Bavaria – Hohenfels Lead and Copper Drinking Water Monitoring, Fiscal Year 2016

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**Lead and Copper Drinking Water Monitoring
USAG Bavaria – Hohenfels
Fiscal Year 2016**

1 Purpose and Background

1.1 General

At the request of Installation Management Command – Europe (IMCOM-E) and in accordance with the Final Governing Standards – Germany (GFGS, DoD 2014), Public Health Command – Europe (PHC-Europe) conducts lead and copper monitoring at public drinking water systems serving U.S. Army Garrison (USAG) Bavaria.

Contained herein is a summary of findings and corresponding regulatory determinations resulting from field sampling activities conducted at the Hohenfels Main community water system (CWS) from 21-23 June 2016.

2 Procedures and Methods

Appendix A details compliance requirements, sample procedures, and laboratory analysis and quality control. Lead and copper results were evaluated using the action levels (ALs) in the GFGS. Compliance is based on 90 percent of the samples being at or below the ALs for each system monitored.

3 Significant Findings

No significant findings were identified as part of this monitoring event.

Analytical results of the first-draw samples are in Appendix B. Certificates of Analysis for all locations and analytes monitored were provided in electronic format to the Directorate of Public Works separately from this report.

4 Conclusions and Recommendations

4.1 Compliance Monitoring Status

The Hohenfels Main CWS complied with the GFGS for lead and copper drinking water monitoring during the fiscal year 2016 (FY16) monitoring event and qualifies for continued ultimate reduced monitoring in FY19.

Table C-1, Appendix C, provides a summary of the USAG Bavaria - Hohenfels lead and copper drinking water monitoring compliance schedule.

4.2 Public Education and Notification

Inform the public of this study and its findings, conclusions, and recommendations.

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| Use of trademarked name(s) does not imply endorsement by the U.S. Army but is intended only to assist in the identification of a specific product. |
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5 Point of Contact

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Appendix A

Procedures and Methods

A-1 Compliance Requirements

The U.S. Environmental Protection Agency (USEPA) and the Final Governing Standards-Germany (GFGS) established action levels (ALs) of 0.015 milligrams per liter (mg/L) for lead and 1.3 mg/L for copper in drinking water. Compliance is based on 90 percent of the samples being at or below the ALs.

A-1.1 Determination of the 90th Percentile

The 90th percentile is calculated by ranking the analytical results in ascending order from the sample with the lowest concentration to the sample with the highest concentration. The total number is then multiplied by 0.9 to arrive at the sample that represents the 90th percentile. The concentration of this sample determines compliance with the GFGS ALs for lead and copper.

For water systems that collect five samples per monitoring event, the 90th percentile is computed by taking the average of the highest and the second highest concentration.

A-1.2 Monitoring Frequency

Standard Monitoring. Water systems must conduct *Standard Monitoring* every six months unless they qualify for reduced monitoring.

Annual Reduced Monitoring (Annually). If the system is below the lead and copper ALs for two consecutive six-month monitoring events, monitoring can be reduced to annually. Sampling must be conducted during the four warmest months of the year.

Ultimate Reduced Monitoring (Triennially). Any small or medium-sized system serving less than 50,000 people that meets the lead and copper ALs during 3 consecutive years may reduce the monitoring for lead and copper from annually to once every 3 years, during the 4 warmest months of the year.

A-1.3 Action Level Exceedance

An AL exceedance triggers other requirements. Water systems that are above the ALs established for lead and copper are required to take corrective actions and to educate and protect consumers. Corrective actions include the collection of water quality parameter (WQP) samples in duplicates, source water monitoring, determining corrosion control treatment options, and conducting plumbing modifications, if appropriate.

A-2 Sample Procedures

A-2.1 Sample Number Requirements

The GFGS defines the minimum number of first-draw and WQP samples to be collected based upon the population served per water system and the monitoring status as summarized in Table A-1. The current population of the monitored water systems was obtained from the Directorate of Public Works (DPW).

Table A-1. Population and Sample Number Requirements

| Population Range Served | Number of First Draw Samples | | Number of WQP Samples (in Duplicates) |
|-------------------------|------------------------------|--------------------|---|
| | Standard Monitoring | Reduced Monitoring | Required in Case of Action Level Exceedance |
| ≤100 | 5 | 5 | 1 |
| 101-500 | 10 | 5 | 1 |
| 501-3,300 | 20 | 10 | 2 |
| 3,301-10,000 | 40 | 20 | 3 |
| 10,001-100,000 | 60 | 30 | 10 |

A-2.2 First-Draw Sample Collection

Public Health Command Europe (PHCE) in conjunction with the DPW maintains a target list of representative sites throughout the distribution system in which the plumbing materials used at that site would be commonly found at other sites served by the water system. Critical customers are also considered. Sample locations are selected from the target list for each monitoring event. The target list may change due to building renovations, additions or usage changes.

The USEPA protocol for first-draw samples requires collection from an interior tap from which water is typically drawn for consumption after a minimum six hour period of non-use, not allowing for any flushing or wasting of water. There is no outer limit on stagnation time. The samples are preserved in the laboratory within ten days of sample collection.

A-2.3 Source and Distribution Water Quality Parameter Sample Collection

WQP sample collection is only required if an AL was exceeded. At least one sample must be collected from the point of entry to the distribution system. If more than one sample is required, additional samples are collected within the distribution system.

The sampling protocol for WQPs requires that the water flow moderately for three to five minutes until the temperature stabilizes to purge any stagnant water in the distribution system prior to sample collection. Samples are collected in duplicates and

preserved at the time of collection and kept cool during transport from the collection site to the laboratory.

As part of the WQP monitoring, free chlorine, conductivity, pH, temperature and turbidity are measured on site using the following HACH® meters: HQ40d(Conductivity, total dissolved solids (TDS), pH, temperature), DR890 (free chlorine), and 2100Q Portable Turbidimeter (turbidity). Calibration and operation procedures are performed consistent with the manufacturer's instruction manuals.

A-3 Laboratory Analyses and Quality Control

A-3.1 Sample Analyses

Samples are submitted to Laboratory Sciences (LS), PHC-Europe, for analysis. First-draw samples are analyzed for lead and copper, WQP samples (if applicable) are analyzed for alkalinity, TDS, lead, copper, calcium, magnesium, and total phosphorus.

A-3.2 Laboratory Accreditation/Registration

PHC-Europe, LS, is accredited by the internationally recognized *Deutsches Akkreditierungssystem Prüfwesen GmbH* (DAP) to DIN EN ISO/IEC 17025:2005. Contract laboratories are, at a minimum, accredited to ISO 17025. Analytical methods utilized for each analyte are noted on the laboratory certificates of analysis provided to the DPW. Additional information is available upon request.

Appendix B

Analytical Results

First-Draw Sample – A 1-liter sample of tap water that has been standing in plumbing at least 6 hours and is collected without flushing the tap.

Action level (AL) – The concentration of lead or copper in tap water which determines whether a water system may be required to install corrosion control treatment, collect water quality parameter samples, collect source water samples, replace lead service lines, and/or deliver public education about lead.

Lead AL – 0.015 mg/L

Copper AL – 1.3 mg/L

90th Percentile – The highest concentration of lead or copper in tap water that is exceeded by 10 percent of the sites sampled during a monitoring period. This value is compared to the action levels to determine whether a system is in compliance or if corrective actions are required. The 90th percentile value is rounded to the same number of significant digits as the respective AL, when possible based on laboratory results provided.

The table below contains the following acronyms and identifiers.

| | |
|-------------|---|
| Shaded | Area represents the 90th percentile value |
| BOLD | Value is above the respective AL |
| Apt | Apartment |
| Bldg | Building |
| CWS | Community Water System |
| mg/L | Milligram Per Liter |

USAG Bavaria - Hohenfels Lead and Copper Drinking Water Monitoring, Fiscal Year 2016

Table B-1. USAG Bavaria – Hohenfels Main, Ultimate Reduced Monitoring

| WATER SUPPLIER | U.S. Army-owned Wells No. 1,2,3,7 and 8 | | | | ACTION LEVELS (ALs) | |
|-----------------------|--|------|---------------------------------|-----------------|---------------------|-------------|
| | | | | | Lead (Pb) | Copper (Cu) |
| | | | | | 0.015 | 1.3 |
| WATER SYSTEM | USAG Bavaria (Hohenfels) - Hohenfels Main Community Water System | | | | mg/L | mg/L |
| SAMPLE ID | SAMPLE LOCATION | | | COLLECTION DATE | RESULTS | |
| | AREA | BLDG | DESCRIPTION | | | |
| B3 | Camp Nainhof | 3 | AAFES Food Court, Kitchen Sink | 23-Jun-16 | 0.0064 | 0.520 |
| B8 | Camp Nainhof | 8 | Apt. 20, Kitchen Sink | 22-Jun-16 | 0.0040 | 0.160 |
| B60 | Camp Nainhof | 60 | Apt. C-2, Kitchen Sink | 22-Jun-16 | 0.0037 | 0.100 |
| B63 | Camp Nainhof | 63 | Sunrise Lodge, Kitchen Sink | 22-Jun-16 | 0.0019 | 0.110 |
| B70A | Camp Nainhof | 70A | Apt. 201, Army Lodging | 23-Jun-16 | 0.0040 | 0.092 |
| B74 | Camp Nainhof | 74 | Apt. E-12, Kitchen Sink | 21-Jun-16 | 0.0034 | 0.250 |
| B75 | Camp Nainhof | 75 | Apt. F-7, Bathroom | 22-Jun-16 | 0.0200 | 0.300 |
| B91 | Camp Nainhof | 91 | DPW, Kitchen Sink | 22-Jun-16 | 0.0070 | 0.098 |
| B329 | Camp Poellnricht | 329 | Kantine, Kitchen Sink | 22-Jun-16 | 0.0051 | 0.230 |
| B755 | Camp Linderberg | 755 | Apt. 755A, Kitchen | 22-Jun-16 | 0.0017 | 0.047 |
| B756 | Camp Linderberg | 756 | Apt. 756F, Kitchen | 22-Jun-16 | 0.0031 | 0.088 |
| B757 | Camp Linderberg | 757 | Apt. 757G, Kitchen | 22-Jun-16 | 0.0063 | 0.210 |
| B758 | Camp Linderberg | 758 | Apt. 758F, Kitchen | 22-Jun-16 | 0.0042 | 0.130 |
| B759 | Camp Linderberg | 759 | Apt. 759B, Master Bathroom Sink | 22-Jun-16 | 0.0036 | 0.110 |
| B762 | Camp Linderberg | 762 | Apt. 762B, Kitchen Sink | 22-Jun-16 | 0.0017 | 0.034 |
| B811 | Camp Mehlhaube | 811 | Field Office, Kitchen Sink | 22-Jun-16 | 0.0027 | 0.074 |
| B852 | Camp Unteroedenhart | 852 | Apt. 219B, Bathroom | 22-Jun-16 | 0.0130 | 0.065 |
| B853 | Camp Unteroedenhart | 853 | Apt. 219A, Barracks Shower | 22-Jun-16 | 0.0011 | 0.260 |
| B855 | Camp Unteroedenhart | 855 | Apt. 161A | 21-Jun-16 | 0.0011 | 0.100 |
| B1162 | Camp Albertshof | 1162 | Messhall, Troop Sink | 22-Jun-16 | 0.0097 | 0.056 |
| 90TH PERCENTILE VALUE | | | | | 0.0097 | 0.26 |

USAG Bavaria - Hohenfels Lead and Copper Drinking Water Monitoring, Fiscal Year 2016

Appendix C

Table C-1. USAG Bavaria – Hohenfels Lead and Copper Drinking Water Monitoring Compliance Schedule

| Name | Water Source/Supplier | Area Supplied | Last Monitoring Event | Next Required Monitoring Event | | | |
|---|---|---|---|--------------------------------|---------------------|------------------|------------------|
| | | | | Status/Fiscal Year | Current Population* | Population Range | Required Samples |
| Hohenfels Main CWS | U.S. Army-owned Wells No. 1,2,3,7 and 8 | Camp Albertshof Camp Nainhof Camp Pöellnrich Camp Linderberg Camp Mehlhaube Camp Unteroendenhart Civilians on the Battlefield (COB) | C6 (FY16) | C7 (FY19) | 5,500 | 3,301-10,000 | 20 First-Draw |
| Ammunition Storage Point #2 (ASP #2) NPWS | Laber-Naab Gruppe at Beratzhausen | ASP#2 | The Final Governing Standards do not require lead and copper monitoring | | | | |
| Freihoelser Training Area (FTA) NPWS | Host-Nation: City of Ebermannsdorf | FTA, TAC 20 | | | | | |

CWS – Community Water System

NPWS – Non-Public Water System

A1, A2 – *Standard Monitoring*: first and second six-month monitoring events

B1, B2 – *Annual Reduced Monitoring*: first and second annual reduced monitoring events during the summer months

C1, C2, C3 ... – *Ultimate Reduced Monitoring*: every three years during the summer months

*Based on population data received from the Directorate of Public Works in FY16