



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

MCHB-PHC

14 December 2018

MEMORANDUM FOR Directorate of Public Works (DPW), U.S. Army Garrison (USAG) Bavaria-Garmisch Military Community (IMBV-GPW), Unit 24515, APO AE 09053

SUBJECT: Lead and Copper Drinking Water Monitoring, USAG Bavaria-Garmisch, Fiscal Year 2018

1. The following community water systems (CWS) USAG Bavaria-Garmisch required lead and copper drinking water monitoring in fiscal year 2018: Garmisch CWS) and Oberammergau CWS. Both water systems complied with the Environmental Final Governing Standards – Germany for lead and copper drinking water monitoring and continue to qualify for ultimate reduced monitoring to take place every three years.
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 comments, or if this report does not meet your needs or expectations, please contact the undersigned at DSN 314-590-9912 or CIV 06371-9464-9912.

FOR THE COMMANDER:

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PHCE

Public Health Command Europe - CMR 402, APO AE 09180



USAG Garmisch Lead and Copper Drinking Water Monitoring, Fiscal Year 2018

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**Lead and Copper Drinking Water Monitoring
USAG Bavaria-Garmisch
Fiscal Year 2018**

1 Purpose and Background

At the request of Installation Management Command - Europe (IMCOM-E) and in accordance with the Final Governing Standards-Germany (GFGS, DoD 2016), Public Health Command Europe (PHCE) conducts lead and copper monitoring at the scheduled public drinking water system within the USAG Bavaria-Garmisch Military Community.

Contained herein is a summary of findings and corresponding regulatory determinations resulting from the lead and copper drinking water monitoring conducted at the USAG Bavaria-Garmisch Garmisch and Oberammergau community water systems (CWS) in Fiscal Year 2018 (FY18).

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 (DPW) separately from this report.

4 Conclusions and Recommendations

4.1 Compliance Monitoring Status

The USAG Bavaria-Garmisch water systems complied with the GFGS requirements for lead and copper drinking water monitoring. They remain in ultimate reduced monitoring, with the next scheduled monitoring event in FY21

Table C-1, Appendix C, provides a summary of the USAG Bavaria-Garmisch Military Community 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.

4.3 Best Management Practices

To reduce exposure to lead in drinking water, consider the following:

- Advise consumers to flush their water faucets for at least one minute prior to use for consumption.
- Advise consumers to use only cold water for consumption (since lead dissolves more rapidly at higher temperatures).
- Clean the faucet aerator screens regularly (i.e., at least monthly) as sediments that may contain lead can collect on faucet screens.
- Regularly flush the distribution and interior building plumbing system to reduce stagnant water and sediment build-up, with primary focus on dead ends and infrequently used water lines.

5 Point of Contact

Direct questions concerning this report to Mr. Wayne Jousma at DSN: 314-590-9780, commercial: 06371-9464-9780, or e-mail: wayne.r.jousma.civ@mail.mil. Direct requests for additional services to MAJ Gregory L. Schaefer at DSN: 314-590-9838, commercial: 06371-9464-9831, or e-mail: gregory.l.schaefer.mil@mail.mil.

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Appendix A

Procedures and Methods

A-1 Compliance Requirements

The U.S. Environmental Protection Agency (USEPA) and the Environmental 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 three consecutive years may reduce the monitoring for lead and copper from annually to once every three years, during the four 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 duplicate, 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 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) and are provided in Appendix C.

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 renovation, 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 upper 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: DR890 (Conductivity, total dissolved solids (TDS), pH, temperature), Pocket Colorimeter™ (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), PHCE, 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

PHCE, 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
Bldg	Building
CWS	Community Water System
FHA	Family Housing Area
mg/L	Milligram Per Liter
Rm	Room

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Table B-1. Garmisch CWS, Ultimate Reduced Monitoring

WATER SUPPLIER	Gemeindewerke Garmisch-Partenkirchen						ACTION LEVELS (ALs)	
							Lead (Pb)	Copper (Cu)
							0.015	1.3
WATER SYSTEM	Garmisch CWS						mg/L	mg/L
SAMPLE ID	SAMPLE LOCATION				COLLECTION DATE	RESULTS		
	AREA	BLDG	FLOOR	DESCRIPTION				
E18-00657-001	ART-B203-DPW	203	2.00	DPW Bldg, Kitchen/Breakroom	24-Jul-18	0.0017	0.016	
E18-00657-002	ART-B204-Shoppette	204	2.00	Shoppette Breakroom	24-Jul-18	0.0025	0.019	
E18-00657-003	ART-B723-CDC/Teen	723	1.00	CDC Infant Room, Left hand sink	24-Jul-18	0.0086	0.580	
E18-00657-004	SHR-B102-Class	102	1.00	Room 128 Kitchen	24-Jul-18	0.0052	0.035	
E18-00657-005	SHR-B104-Class	104	1.00	Room 120 Kitchen	24-Jul-18	0.0020	0.095	
E18-00657-006	ART-B700-Hous	700	4.00	Apt G Kitchen	24-Jul-18	0.0008	0.041	
E18-00657-007	ART-B702-Hous	702	2.00	Apt C Kitchen	24-Jul-18	0.0010	0.049	
E18-00657-008	ART-B703-HousB	703	1.00	Apt B Kitchen	24-Jul-18	0.0014	0.059	
E18-00657-009	ART-B703-HousD	703	2.00	Apt D Kitchen	24-Jul-18	0.0031	0.022	
E18-00657-010	ART-B704-Hous	704	1.00	Apt A Kitchen ***Only 2hr Settling Time***	24-Jul-18	0.0004	0.019	
E18-00657-011	ART-B706-Hous	706	1.00	Apt B Kitchen	24-Jul-18	0.0011	0.042	
E18-00657-012	ART-B710-Hous	710	1.00	Apt A Kitchen ***No Collection Time noted, assumed 6 hour hold***	24-Jul-18	0.0031	0.11	
E18-00657-013	ART-B711-Hous	711	1.00	Apt B Kitchen	24-Jul-18	0.00049	0.021	
90TH PERCENTILE VALUE						0.0052	0.110	

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Table B-2. Oberammergau CWS, Ultimate Reduced Monitoring

WATER SUPPLIER	City of Oberammergau					ACTION LEVELS (ALs)	
						Lead (Pb)	Copper (Cu)
						0.015	1.3
WATER SYSTEM	Oberammergau CWS					mg/L	mg/L
SAMPLE ID	SAMPLE LOCATION				COLLECTION DATE	RESULTS	
	AREA	BLDG	FLOOR	DESCRIPTION			
E18-00657-014	NATO-B632-Admin	632	1	Admin Bldg Female Restroom	25-Jul-18	0.0031	0.045
E18-00657-015	NATO-B761-Enzian	761	1	Enzian Haus Restroom, Center of Bldg	25-Jul-18	0.0067	0.029
E18-00657-016	NATO-B762-Edel.	762	1	Edelweiss Haus Restroom, Center of Bldg	25-Jul-18	0.0014	0.074
E18-00657-017	NATO-B763-Dining	615	1	Recreation area short order kitchen sink, used as alternative to Bldg 763 due to renovation of bldg 763.	25-Jul-18	0.0014	0.15
E18-00657-018	NATO-B764-Rec	764	1	Kitchen sink.	25-Jul-18	0.0013	0.052
90TH PERCENTILE VALUE						0.0049	0.11

Appendix C

Water System Summary Schedule

Table C-1. USAG Bavaria-Garmisch 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
Garmisch CWS	Gemeindewerke Garmisch-Partenkirchen	Sheridan Kaserne	C2 (FY18)	C3 (FY21)	1,800	501-3,300	10 First-Draw
		Breitenau Family Housing Area, Artillery Kaserne					
Oberammergau CWS	City of Oberammergau	NATO School (6 Buildings under U.S. Control)	C2 (FY18)	C3 (FY21)	400	< 500	5 First-Draw

CWS – CommunityWater 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

ICA ... – Implementing corrective actions due to action level exceedance, Standard Monitoring is required again

*Based on FY18 population data confirmation received from the Directorate of Public Works (DPW)