



GUAM ENVIRONMENTAL PROTECTION AGENCY

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Lt. Col. Todd Inouye
Base Civil Engineer
Building 18001 Arc Light Blvd
Andersen Air Force Base
Yigo, GU 96929

DATE: JANUARY 03, 2018 ~~19~~ *2019*

NAME: Denmark Musngi
SIGN: *[Signature]*
DATE: 2 Jan 2019
TIME: 4:22 PM

Subject: Andersen Air Force Base Water System PWS ID. No. GU0000009
Chlorination of 0.5MG Water Reservoir at Northwest Field Water System
NOV#2019-001

Hafa Adai Lt. Col. Inouye,

I. BACKGROUND

The Andersen Air Force Base Water System has a permit to operate the Northwest Field Water System to supply domestic drinking water and fire suppression demand to Northwest Field facility. The System is an extension of the USAF water system, drawing water from USAF production wells AF-5 and AF-6, with a transmission, distribution, storage tank, and chlorination system. Guam EPA approved onsite generated liquid chlorine (MIOX system) for chlorinating the water system to conform to the Guam Safe Drinking Water Act.

On December 28, 2018, Mr. Angel Marquez and Ms. Juliana Mendoza of the Guam EPA Safe Drinking Water Program conducted a routine Sanitary Survey for compliance with the Agency's mandates under the Total Coliform and Ground Water Rules. During the survey, Guam EPA staff inspected the disinfection system located at the 0.5 Million Gallon Water Storage Tank at the Northwest Field service area. The approved disinfection method "onsite generated" known as MIOX went out of service at some time after the last sanitary survey, according to the operator, Mr. Zachary dela Cruz, Operator 36 CE/WFMS, but he was unable to specify exactly when this happened.

During the inspection, Mr. Angel Marquez and Ms. Juliana Mendoza of the Guam EPA Safe Drinking Water Program observed that a different form of disinfection had been installed utilizing a commercial pool sanitizer with the label "Pool Time Chlorination Tabs (3-in-1 Formula)", which according to the packaging contains Trichloro-S-Triazinetrione, CAS No. 87-90-1 (99% weight) and boric acid CAS No. 10043-35-3 (0.5-1%). According to Mr. dela Cruz and supported by the observations of the Guam EPA inspectors, this product was being used to disinfect the water supply at

TODU Y NILALA Y TANO MAN UNO - ALL LIVING THINGS OF THE EARTH ARE ONE.

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the water storage tanks. Mr. dela Cruz was not sure how long the US Air Force Water system has been using this chemical to treat water in the tank.

All Public Water Supply Systems (PWSS) are required to obtain a permit from Guam EPA prior to any changes in the water system pursuant to the Guam Primary Drinking Water Regulations, 22 GAR §6141.5(c). The operators of AAFB water system introduced a new treatment process (trichlor) in lieu of the approved system (MIOX) without first obtaining approval from Guam EPA.

Trichloro-S-Triazinetrione is also known as trichloroisocyanuric acid or trichlor for short. It is used as an ingredient in some products that are certified for use for drinking water treatment but the product "Pool Time Chlorination Tabs (3-in-1 Formula)" is an EPA registered pesticide sold for use as a sanitizer for pools and spas. Guam EPA does not allow the use of this sanitizer product for the disinfection of potable water, piping or storage tanks, even during the super chlorination prior to occupancy of the piping system and appurtenances.

When trichlor is dissolved in water, one of its dissociation products, cyanuric acid, is known to interfere with standard methods used to measure free chlorine residual, and as a result, actual chlorine residual is usually lower than indicated in operator's reports. The U.S. Environmental Protection Agency (USEPA) formally recognized this issue in an April 18, 2018, memorandum, which is attached for information and use in assessing the effects of the use of this product provided to the quality of water provided to users of the AAFB system.

Boric acid is used as an ingredient in many cleaning and personal hygiene products such as detergents, deodorants, and shampoos. It is also used as an insecticide in the control of cockroaches and termites. Its purpose as an active ingredient of the product "Pool Time Chlorination Tabs (3-in-1 Formula)" is not immediately clear to Guam EPA, however we are not aware of any approved use of boric acid as a drinking water treatment chemical, at any concentration or percent formulation.

II. VIOLATION

The Guam Safe Drinking Water Act prohibits *"Failure by a supplier of water to comply with regulations promulgated pursuant to §53105."* 10 GCA §53113(b).

The operators of AAFB water system introduced a new treatment process in lieu of the approved system (MIOX) without first obtaining approval from Guam EPA in violation of 22 GAR §6141.5(c).

III. COMPLIANCE ORDER

Andersen Air Force Base Water System is hereby ordered to:

- Cease and desist using "Pool Time Chlorination Tabs (3-in-1 Formula)" to treat

water at the 0.5 MG water storage tank located at Northwest field, Dededo, Guam.

- Apply to Guam EPA for a permit to utilize any disinfection system other than the original approved system. The application must include all relevant information identifying equipment and chemicals to be used for water treatment. All chemicals and equipment used must be approved for use in drinking water systems. The application must also include standard operating procedures (SOPs) detailing operation and maintenance of the proposed system.
- Discharge all water currently contained in the water storage tank and associated distribution piping, and flush and sanitize the tank and distribution system in order to remove any residue within 10 days of service of this notice.
- Conduct water testing for microbiological contamination upon completion of the preceding item and provide Guam EPA the laboratory results as soon as possible.
- Provide Guam EPA with a written report within 30 days of receipt of this NOV detailing the duration of the usage of Pool Time Chlorination Tabs (3-in-1 Formula (i.e., when it was first used and when its usage was stopped, and the total time that elapsed during that period) and an assessment of the impacts of this usage, to include but not be limited to: an assessment of probable average, minimum, and maximum chlorine residual concentrations during this time period, computed on the basis of the attached USEPA memo and associated online calculator; and a computation of the average and maximum concentrations of boric acid delivered to users of the AAFB system during this time.
- Issue a precautionary public notice as soon as possible to all users of water supplied by the USAF water system, utilizing the attached template. Any proposed modification of the language included in the attached template must be approved by Guam EPA.

IV. ADMINISTRATIVE PENALTY ORDER

Guam EPA hereby imposes an administrative penalty in the amount of One Thousand Seven Hundred (\$1,700.00) for each day of violation, pursuant to 10 GCA §53114(a).

V. NOTICE OF RIGHT TO APPEAL

You may file within ten days of the date of your receipt of this Notice of Violation/Order of Compliance, a Notice of Intent to Appeal also known as a Notice of Defense with the Guam EPA's Board of Directors, setting forth in such Notice of Intent to Appeal/Notice of Defense, a verified petition outlining the legal and factual bases for such an appeal. A copy of the Notice of Intent to Appeal/Notice of Defense is attached for your convenience.

Unless a written request for a hearing signed by or on behalf of the person, agency or business entity named above in this Notice of Violation/Order of

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Compliance is hand delivered or mailed to Guam EPA within ten days after the Notice of Violation/Order of Compliance was personally served on you or mailed to you, Guam EPA may proceed upon the Notice of Violation/Order of Compliance without a hearing. A request for hearing may be made by delivering the enclosed form entitled "Notice of Intent to Appeal also known as a Notice of Defense", or by delivering a notice of defense as provided in 5 GCA §9205, to the following address:

Guam Environmental Protection Agency Board of Directors
c/o Administrator Guam Environmental Protection Agency
Building 17-3304 Mariner Avenue
Tiyán Barrigada, Guam 96913

If you file a Notice of Intent to Appeal/Notice of Defense, the Guam EPA's Board of Directors shall hold a public hearing, at which time you may appear and present evidence in person or through counsel in support of this petition.

Failure to file a Notice of Intent to Appeal and Verified Petition within the period specified above will constitute a waiver of your right to a hearing. If you waive your rights to a hearing the Notice of Violation and Order of Compliance will become final, and Guam EPA may proceed upon the Order without a hearing and without further notice to you.

Should you have questions please contact Guam EPA Chief Engineer CDR Brian Bearden, P.E., BCEE at 300-4779 or Julie Mendoza SDWP staff 300- 9026.

Sincerely,


WALTER S. LEON GUERRERO
Administrator

enclosures: Notice of Defense
Public Notification Template
Public Notification Certification
USEPA Dichlor/Trichlor Memo Dated April 18, 2018

cc: USEPA Region 9
Attorney General Office
Guam EPA Pesticides Program



GUAM ENVIRONMENTAL PROTECTION AGENCY

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GOVERNOR OF GUAM

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ERIC M. PALACIOS
ADMINISTRATOR

YVETTE CRUZ
DEPUTY ADMINISTRATOR

P.O. BOX 22439 BARRIGADA, GU 96921

EPA.GUAM.GOV

Guam EPA Case# _____

NOTICE OF DEFENSE

I, _____, have received your Notice of Violations and/or Order of Compliance, dated _____, charging me for violations, and I wish to:

(Please check appropriate sections)

A. Request for a hearing and

1. Object to the accusation on the ground that it does not state acts or omissions upon which the Agency can proceed.

2. Object to the form of accusation on the ground that it is so indefinite or ambiguous that I cannot identify the infraction or prepare my defense.

3. Wish to prepare new matter in my defense.

4. Admit to the accusation in part.

B. Admit the accusation in whole.

My mailing address is:

Signature:

Date:

DRINKING WATER WARNING

On [give date], we received notice that the water disinfection chemical in use by our water system is not approved by the Guam Environmental Protection Agency, for reason that the product, "Pool Time Chlorination Tabs (3-in-1 Formula)" is not certified or approved for use in potable water systems.

What should I do? What does this mean?

- **YOU DO NOT NEED TO TAKE ANY ACTION. THIS IS AN ADVISORY NOTICE ONLY.** The AAFB water system has removed all water treated with the subject disinfection product, and the water delivered to all system users is now considered safe. AAFB is working with Guam EPA to determine the exact exposure to this product that may have occurred.

"Pool Time Chlorination Tabs (3-in-1 Formula)" is composed of the following active ingredients: trichloro-s-triazinetriene, CAS No. 87-90-1 (99% weight) and boric acid CAS No. 10043-35-3 (0.5-1%).

Trichloro-s-triazinetriene is also known as trichloroisocyanuric acid or trichlor for short. It is used as an ingredient in some products that are approved and certified for use for drinking water treatment. It is very unlikely that use of this chemical resulted in any adverse health effects.

Boric acid is used as an ingredient in many cleaning and personal hygiene products such as detergents, deodorants, and shampoos. It is also used as an insecticide in the control of cockroaches and termites. Boron is also considered a possible trace mineral nutrient for humans, with an average daily dietary intake of about 1.5 mg for male adults. While exposure to large concentrations of boron can result in a number of severe health effects, it is very unlikely that any users of the AAFB water system were exposed to concentrations of boron large enough to produce any adverse health effects.

What is being done?

The AAFB water system has already removed all water treated with the unapproved disinfection product, and the water delivered to all water system users is considered safe. AAFB water system is working with Guam EPA to determine the exact exposure(s) to this product that may have occurred.

For more information, please contact [name of contact] at [phone number] or [mailing address].

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by the Andersen Air Force Base Water System PWS ID No. GU0000009. Date distributed: _____.

Public Notice Certification

I _____ certify that the public notice(s) that I am submitting here before you have been posted , hand delivered, mailed, published in the newspaper, or submitted to the media (T.V. / Radio station). I also acknowledge that anybody who knowingly and willfully makes false statement, presentation, or certification in any application, records, report plan or other documentation filed or required to be maintained under the Guam Safe Drinking Water Regulations, or by any certification, or order issued under the Guam Safe Drinking Water Regulations, or who falsifies, tampers with or knowingly renders inaccurate information shall be subject to the penalties.

Notice distributed by _____ on _____.
(Method of Notification) (Date of Notification)

Public Notice Locations: _____.

Public Notice has required Elements;

- A description of the violation (MCL or FTM, etc.!).
- When the violation or situation occurred (MCL or FTM, etc...)
- Potential adverse health effects, using the standard mandatory language(MCL)
- Population at risk (MCL)
- Whether alternative water supply is needed (MCL or FTM, etc...)
- Actions consumers should take to reduce their exposure to the contaminant (MCL)
- What are you doing to correct the violation or situation (MCL or FTM, etc...)
- When you expect to return to compliance (MCL or FTM, etc...)
- Name, business address, and phone number for additional information, and (MCL or FTM, etc...)
- Standard language encouraging distribution to all persons served. (Where applicable)

(Signature of PWS contact)

(PWS contact title)

(PWS Name)

(PWS I.D. Number)




UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 18 2018

OFFICE OF WATER

MEMORANDUM

Subject: Compliance Determination for Inactivation Requirements of the National Primary Drinking Water Regulations when a Public Water Systems Uses Dichlor and Trichlor for Primary Disinfection

From: Anita M. Thompkins, Director
Drinking Water Protection Division 

To: Regional Water Division Directors
Regions I-X

This memorandum is being issued to assist the Safe Drinking Water Act (SDWA) primacy agencies in the implementation of the microbial inactivation/disinfection requirements of the National Primary Drinking Water Regulations (NPDWRs) and the use of Dichlor (Dichloroisocyanuric acid) or Trichlor (Trichloroisocyanuric acid) for primary disinfection to meet those requirements.

It should be noted that under the SDWA, EPA's Office of Ground Water and Drinking Water does not approve disinfectants for disinfection of drinking water. These uses are approved through the Office of Pesticide Programs under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).¹ However, the NPDWRs establish requirements for inactivation/disinfection that public water systems must meet. EPA researchers have identified concerns regarding the measurement of free chlorine residual, measured in finished drinking water, using the NPDWRs-approved DPD² and indophenol methods in the presence of the cyanuric acid found in Dichlor and Trichlor. Free chlorine residual measurement is necessary to apply the inactivation contact time tables found in the NPDWRs to determine the inactivation achieved in the treatment process for compliance with inactivation/disinfection requirements.

Based on the available literature, Dichlor and Trichlor, when dissolved in water, rapidly hydrolyze to release chlorine-containing species, where only a portion is free chlorine (i.e., hypochlorous acid and hypochlorite ion). The actual free chlorine percentage depends on several factors, including pH, temperature, chemical dosage and source (i.e., Dichlor or Trichlor), and the water's chlorine demand. The NPDWRs-approved DPD and indophenol methods cannot measure free chlorine residual in the presence of cyanuric acid when Dichlor or Trichlor are

¹ For more information on the intersect between SDWA and FIFRA, see <https://www.epa.gov/pesticide-registration/guidance-disinfectant-products-intended-treat-drinking-water>.

² DPD stands for N,N-diethyl-p-phenylene diamine. The method is generally referred to as DPD.

being used for primary disinfection. This has raised concerns that the inactivation determined based on chlorine residual measurements using the approved DPD and indophenol methods, in the presence of the cyanuric acid in Dichlor and Trichlor, may not be sufficient to meet inactivation requirements for the Surface Water Treatment Rules (SWTRs) or, if applicable, the Ground Water Rule (GWR) since free chlorine is not being measured.

The EPA has developed a web-based calculator to determine free chlorine residual in the presence of Dichlor and Trichlor at 25°C. That calculator is available at: <https://usepaord.shinyapps.io/cyanuric/>. EPA researchers intend to develop an enhanced web-based calculator that would determine free chlorine residual in the presence of Dichlor or Trichlor at a range of temperatures. Upon publication of the updated web-based calculator, EPA will conduct a webinar to train the states and public water systems on how to utilize the tool.

In the interim, the EPA recommends that primacy agencies review information from public water systems that have installed (or are considering installing) primary disinfection using Dichlor or Trichlor. Primacy agencies can conduct the review through their existing Public Water System Supervision Program oversight activities programs (e.g., sanitary surveys, plan review and treatment change approval process, required SWTR/GWR monitoring). The review should focus on SWTR and, if applicable, GWR inactivation requirements and should include:

- Determining the primary disinfectant(s) being used by the public water system,
- Identifying the location(s) for measurement of disinfectant residual(s) used in the calculation of inactivation achieved,
- Calculating inactivation routinely achieved compared to inactivation required, and;
- Requesting information about the analytical method being used for disinfection residual measurement.

This review will allow the primacy agency and the public water system to work together to identify and address vulnerabilities that might potentially compromise the public water system's ability to meet disinfection requirements. EPA will continue to work closely with the water sector community to identify new information regarding the use of Dichlor/Trichlor as a primary disinfectant and with primacy agencies reviewing public water systems' disinfection practices.

Should you have any questions or concerns regarding this memorandum, please contact me or Cathy Davis of the Protection Branch at Davis.CatherineM@epa.gov.

cc: Regional Drinking Water Program Managers
Regional Drinking Water Enforcement Program Managers
Alan Roherson, Association of State Drinking Water Administrators
Anita Pease, Acting Director, Antimicrobials Division, Office of Pesticide Programs, EPA