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Julian -

Enclosed is a summary of the potable water test results for total dissolved solids (TDS), sodium, and iron. Starred items on the list are those exceeding recommended limits. All other parameters were found to be within both primary (enforceable) and secondary (recommended) standards of the Safe Drinking Water Act.

As discussed, the standards for total dissolved solids and iron were set for aesthetic rather than health reasons, and so the excessive levels of these constituents should be cause for concern only if a deterioration in the color, or taste of the water is noticed. This will be explored further in the forthcoming Environmental Engineering Survey. The proposed limit on sodium, however, is based on health considerations for some segments of the population. I am also enclosing the proposed rules for sodium in drinking water as published in the Federal Register. You might want to read through this as an indication of what you can expect in the future. Although it is not necessary to take any action right now, the Medical Department on base should be advised of the new proposed regulations and of the high sodium content of the water. Please let me know if they have any recommendations or are going to take any action.

A copy of the test results in full will be enclosed in the Environmental Engineering Survey report. When the Quality Control Laboratory at Camp Lejeune completes the last remaining test for nitrate, they have also been requested to send you a copy of the complete test results.

In summary, the water is legally in compliance with State and Federal standards. Your main concern right now should be in any recommendations the Medical Department may have on the high sodium levels. Give me a call if you have any questions.

Doreen Cantor

Doreen Cantor
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DISTRIBUTION SYSTEM	CONTAMINANT	CONCENTRATION (PPM)	RECOMMENDED LIMIT
Hadnot Point	Total Dissolved Solids (TDS)	224.0	500
	Sodium	20.4*	20 (proposed)
	Iron	0.07	0.3
Terawa Terrace	TDS	134.0	
	Sodium	7.2	
	Iron	0.18	
Courthouse Bay	TDS	160.0	
	Sodium	50.4*	
	Iron	0.02	
Holcomb Boulevard	TDS	260.0	
	Sodium	11.4	
	Iron	0.02	
Montford Point	TDS	344.2	
	Sodium	82.5*	
	Iron	1.35*	
Onslow Beach	TDS	284.0	
	Sodium	43.2*	
	Iron	0.41*	
Rifle Range	TDS	424.0	
	Sodium	77.5*	
	Iron	0.02	
MCAS	TDS	624.0*	
	Sodium	142.5*	
	Iron	0.04	

standards, a system exceeds the standard if the individual or "single samples" taken in any month exceed the maximum levels established in 40 CFR § 141.14(a)(2), (3); § 141.14(b) (1)(ii), (iii); and § 141.14(b)(2)(ii)(iii). It is emphasized that these provisions are not a substitute for proper sampling and analytical procedures including verification but merely provide latitude to the States to deal with small systems in the infrequent event of an improperly conducted sampling or test. It is not the intent of this amendment to allow public water supplies to reject samples known to be properly collected and analyzed.

Investigations into the nature of the problem should be made and corrective measures should be taken, especially in repetitive cases where the amendment is exercised more than once annually.

Comments are solicited on the merits of this modification of the regulations and on the adequacy of the safeguards as well as alternative suggestions for dealing with the problem of possible spurious samples leading to unnecessary public notification. This amendment is being made as an interim proposal while EPA is preparing comprehensive revisions of the microbiological standards for the Revised National Primary Drinking Water Regulations.

The amendment also provides that periods shall be used instead of semi-colons after after 40 CFR § 141.14(a)(1); § 141.14(b)(1)(i); and § 141.14(b)(2)(i) to make it clear that the microbiological limitations are composed of two separate maximum contaminant levels—the "monthly average" standard and the "single sample" standard.

In addition, Section 141.21(a) is being clarified to the effect that suppliers of water for community water systems and non-community water systems may engage the services of approved laboratories to monitor and analyze for coliform bacteria for the purpose of determining compliance with Section 141.14. Contrary to EPA's intent, the existing language in Section 141.21(a) has been interpreted by some to mean that the suppliers of water shall themselves monitor and analyze for coliform bacteria and could not use other private and State laboratories for this purpose. That interpretation was inconsistent with Section 141.28 which requires all analyses except turbidity and free chlorine residual to be performed in a laboratory approved by the State.

Sample Storage Time

Questions have arisen with respect to the preservation and storage of drinking water samples for microbiological analysis. The EPA believes that the samples should be analyzed as soon as possible following collection and certainly within 30 hours of collection. The 14th edition of *Standard Methods for Examination of Water and Wastewater* recommends that samples be processed within one hour of collection. If transit time extends beyond 6 hours, the sample should be refrigerated and consideration given to analysis by a local laboratory facility. *Standard Methods for Examination of Water and Wastewater* further recommends that since drinking water samples often have to be transported by mail, the total elapsed time between collection and analysis should not exceed 30 hours. Under extraordinary circumstances a 48 hour transit time will be permitted, but State programs should be developed to keep transit time to a minimum. Samples awaiting analysis after 48 hours should be rejected. Coliform bacteria, if present, ordinarily exist under starving conditions in high quality drinking water. Death rates of these organisms are greatly influenced by the lack of an organic nutrient source. Coliforms will also irreversibly attach to glass surfaces and thus be effectively lost to both the MF and MPN counting procedures since the organisms cannot easily be removed from the walls of the sample container. In addition, it is emphasized that long holding times can lead to excessive bacterial growth in the sample and essentially mask the true count of coliforms which could lead to erroneous conclusions. Finally, exceedingly long periods of time between collection and analysis of the water samples (transit time) may allow contamination to go unnoticed.

Additional studies on the preservation of drinking water samples for coliform determination and the time intervals between sampling and analysis are underway and should provide additional information within the next few months.

Alternative Analytical Methods

The National Interim Primary Drinking Water Regulations specify, in most cases, a single analytical procedure for determining the concentration of each contaminant. However, Section 141.27 states that alternative analytical techniques may be used with the written permission of the State, and with the concurrence of the Administrator of the U.S. Environmental Protection Agency. Proposals for an alternate method for nationwide use are initially evaluated by the EPA's Environmental Monitoring Support Laboratory (EMSL) with final review by the EPA's Office of Drinking Water. In order for an alternative method to be approved it must be deemed substantially equivalent to the prescribed test with precision and accuracy. In addition, the use of an alternate analytical method for determination of compliance with any maximum contaminant level (MCL) does not change the frequency of monitoring required.

A number of alternative analytical techniques have been approved by EPA at the request of some of the States. These techniques have been determined to be equivalent methods and are now acceptable for determining compliance with the NIPDWR. In addition to the alternative analytical methods now approved, several references ASTM methods, essentially identical to the originally specified procedures, have been added for the convenience of analysts. This proposed amendment incorporates approved analytical techniques and ASTM methods into the NIPDWR.

It should be noted that flameless atomic absorption, graphite furnace technique, requested by several States as an alternative method to conventional atomic absorption analysis, will soon be published in a revision of the 1974 EPA Methods Manual. In the meantime, the procedure "Methods for Metals in Drinking Water" (Interim Procedure) is available from the Director of the Environmental Monitoring and Support Laboratory, EPA, 26 West St. Clair Street, Cincinnati, Ohio 45268.

Monitoring for Sodium in Drinking Water

This proposed amendment requires (1) monitoring of sodium levels in drinking water by community water supply systems at least annually for surface water systems and at least every three years for systems using groundwater sources. In addition, (2) suppliers must report the levels to EPA within ten days of receipt of the results and (3) suppliers must notify the public.

The sodium ion is an ubiuitous constituent of natural waters. It is derived geologically from the leaching of surface and underground deposits of salts such as sodium chloride, from the decomposition of sodium aluminum silicates and similar minerals and from the intrusion of sea water into fresh aquifiers. Salt spray from the sea is often the largest contributor of sodium ions within 50–100 miles of the seacoast. Some soils exhibit the property of ion exchange in which calcium ions in the water are replaced by sodium ions during normal leaching.

Human activities also contribute sodium ions to natural waters. The sodium chloride used as a deicing agent on roads enters water supplies in runoff from both roads and storage depots. Municipal use of water typically results in the addition of 20–50 mg/liter of sodium ion, primarily from urine and washing products. Procedures for water treatment often produce a finished water with geater sodium-ion concentration than the raw water from which it was derived. Sources of sodium ion in the treatment of water include sodium hypochlorite, sodium hydroxide, sodium carbonate and sodium silicate. Ion exchange softening, including home water softeners, may also significantly increase the sodium ion concentration in finished drinking water.

Information available at this time indicates that sodium concentrations can be extremely variable, both in surface and ground waters, depending on local circumstances. As a general rule, deep wells, unaffected by surface phenomena, tend to have relatively stable sodium concentrations. Other ground waters are affected by rainfall, and particularly in northern areas, by the use of sodium salts in de-icing of highways. Surface waters tend to show seasonal variations, and of course are affected by run-off, spills, and droughts.

Evidence indicates that excessive sodium intake contributes to an age related increase in blood pressure that culminates in hypertension in genetically susceptible people. Furthermore, in a recent study, high school students living in a community distributing drinking water having sodium concentration levels of 100 mg/1 had higher blood pressure levels than those residing in a community distributing water having a low sodium concentration level of 8 mg/1.

The NAS has estimated that about 15 to 20% of the population are at the risk of developing hypertension. Also a small segment of the U.S. population is on severely restricted diets which require a total sodium intake or less than 500 mg/day. These persons need water containing less than 20 mg/liter sodium ion. The EPA recommends that 20 mg/1 be a goal for public water systems.

A larger portion of the population, about 3%, is on sodium-restricted diets calling for sodium intake of less than 2,000 mg/day. Sodium intake from food is generally by far the major source of sodium intake. However, in many instances, where high sodium concentration levels in the drinking water occur, the contribution of sodium by water may constitute a significant fraction of the total sodium intake. Therefore, knowledge of the sodium ion content of the water supply and maintenance of it at the lowest practicable concentration is critical in arranging diets for persons who require a low sodium diet.

The current National Interim Primary Drinking Water Regulations (40 *FR* 59566) do not contain a MCL for sodium and monitoring is not required for this substance. EPA recommended in the NIPDWR and the proposed Secondary Drinking Water regulations (42 *FR* 17143) that States voluntarily monitor for sodium so that the public and physicians may be informed of the sodium content of available drinking water and so that they may take appropriate action when certain levels are exceeded. In addition, the National Academy of Sciences included sodium in its study of the health effects of inorganic chemicals and recommended that sodium concentration in water should be maintained at the minimum possible, and that provisions should be made for notifying persons on low sodium diets.

The sodium content of public water supplies should be known and this information should be disseminated so that persons who must restrict their sodium intake will be able to make appropriate adjustments to their diets.

Sodium was one of the issues of a petition for review of the NIPDWR. It was argued that monitoring for sodium should be mandatory rather than voluntary. The Court indicated that the study carried out by NAS may aid EPA in re-evaluating its approach to sodium. In the meantime, the 1977 Amendments to Sections 1414(c) and 1445(a) of the Safe Drinking Water Act have clarified EPA's authority to require monitoring, reporting and public notification of levels of any contaminant for which a MCL has not been established.

This proposed amendment establishes special monitoring, reporting and public notification requirements for sodium, and otherwise unregulated contaminant, as now authorized by the SDWA. Although it appears in 40 CFR Part 141, it has not, strikctly speaking, a NIPDWR. Therefore, it has been included in Subpart E of Part 141 which was established when EPA promulgated special monitoring requirements for organic chemicals in drinking water in 1975 (40 *FR* 59588, December 24, 1975). States will not be required to adopt these special requirements for sodium as a condition for maintaining or obtaining primary enforcement responsibility under Section 1413 of the SDWA. These requirements will be enforceable by EPA under the separate enforcement authorities provided under Sections 1414(c) and 1415 of the SDWA. Nevertheless, States are strongly urged to adopt these requirements as State drinking water regulations to minimize the federal enforcement role in primacy States. For this reason, it is proposed that these requirements would be effective 18 months following promulgation to afford States ample time to adopt these requirements. Comment is solicited as to whether these requirements should be made effective sooner.

The purpose of a sodium monitoring program is the assurance that affected persons are informed, in order to make any necessary adjustments in water usage. Suppliers of the water will be required to report to EPA the results of such sodium monitoring within 10 days follwing receipt of the reults. Results should be reported to the State instead, where the State has adopted these regulations. In addition, the supplier will be required to notify consumers and physicians of the sodium content of the water by either inclusion of a notice in the water bills of the system, or by any other regular mailing or by any other effective means within three months. The supplier of water will also be require to notify the State and appropirate local public health officials (local health department and physicians), of the sodium levels by written notice within three months. However, where the State has adopted this regulation and provides the notice to the local public health officials, the supplier may be relieved of this particular notice requirement. A copy of each notice sent in compliance with these requirements must be sent to EPA within 10 days of its issuance.

Comments are solicited regarding the merits of the proposed notification procedures. In those States that adopt these sodium monitoring, reporting and public notification requirements, it may not be necessary for suppliers of water to notify EPA at all, the States may wish to assume responsibility for notifying appropriate local health officials themselves. Another possible option is to limit public notification of the sodium levels in drinking water to physicians, without direct consumer notification. However, incorporation of such information in regularly issued water bills may be the most economical and efficient means for notification. Some water systems already routinely include water quality information with water bills, and other systems have found occasion to include such notice in bills under existing regulations.

It is proposed that monitoring and reporting of sodium concentration levels be performed at least annually in all community water systems utilizing surface water sources and at least every three years for community water systems utilizing only ground water sources beginning 18 months following promulgation. However, States and EPA may establish more frequent monitoring and reporting requirements in instances where it is suspected that significant fluctuation of seasonal variation in sodium concentration levels in the water supply occurs.

Analysis of sodium can be performed rapidly by the flame photometric method (*Standard Methods*, 14th ed., pg. 250) or by Atomic Absorption (*Methods for Chemical Analysis of Water and Waste*, pg. 147). It is estimated that a single sodium analysis performed by these methods will cost about $5, and a laboratory performing multiple sodium analyses can achieve considerable economy reducing the cost per sample to $2 or less.

At these rates, the total national cost to meet the monitoring requirements for sodium would range between $100,000 and $250,000 for the 60,000 community water supply systems involved. On the basis of these cost estimates, the additional annual monitoring cost increase per capita is expected to range from $0.08 to $0.20 for systems serving 25 people to less than $0.01 for systems serving more than 500 people. It should be noted that some States already either require or recommend monitoring for sodium, and some have established limits for sodium in drinking water; thus water suppliers who already monitor for sodium will not be impacted by this proposed regulation.

Comments are solicited regading the merits of the proposed notification procedures. The incorporation of information on the sodium content of water in regular bills might often be the most economical and efficient means for notification. Some water systems already routinely include water quality information with water bills, and other systems have found occasion to include notices of one sort or another in such bills as required by existing regulations. Comment is solicited on this option, as well as on the merits of more direct notification procedures in regard to sodium concentrations.

In addition, EPA is studying the feasibility of establishing Maximum Contaminant Levels (MCLs) for sodium in the Revised Primary Drinking Water Regulations. Comments are solicited on factors for determining the appropriate MCL, monitoring frequencies, and treatment technologies for sodium.

Fluoride

For more than 30 years, the controlled fluoridation of municipal water supplies has benefited the dental health of the nation. President Carter has expressed his personal endorsement of fluoridation as a safe, effective public health measure, and has promised the support of his Administration in speeding the time when "all Americans will share in the benefits that modern medicine has made possible." The Surgeon General and the U.S. Public Health Service strongly endorse the fluoridation of community water supplies at recommended concentrations, and stress that making fluoridated drinking water available to its residents is the single most important step a community can take to improve dental health. The EPA also endorses and encourages the practice of controlled fluoridation of community water supplies at recommended concentrations.

In light of this policy, a recent report by the General Accounting Office (GAO) noted that there has been some confusion as to the significance of the listing of a MCL for fluoride. For clarification and at the suggestion of the GAO, the EPA is proposing to amend Section 141.11 to include a statement which explains that fluoride at optimal levels can have beneficial effects in reducing the occurrence of tooth decay. By setting the MCL, the Agency did not want to give the impression that fluoride should be considered as a detrimental contaminant at concentration levels in drinking water below the MCL. While optimal levels of fluoride have beneficial effects, the MCL was established to protect against high concentrations of fluoride which can cause tooth damage (moderate to severe dental fluorosis). Thus, the establishment of a MCL and an acknowledgment of the benefits of fluoride in drinking water at optimum levels is not a contradiction. Other substances for which MCLs have been established may also have beneficial effects at levels below the MCL.

Compliance Monitoring and Record Maintenance

The purpose of this amendment is to clarify that monitoring samples that are taken by the State may be used to determine compliance with the NIPDWR. The present regulations state that compliance with any maximum contaminant level (MCL) is to be determined pursuant to the applicable monitoring and analysis requirements set forth in Subpart C of the NIPDWR. However, the monitoring and analysis requirements are directly applicable to the suppliers of water, and it is unclear as to whether the results of such compliance sampling performed by the supplier were meant to be the only samples that could be used to determine compliance with the regulations.

The language of this amendment will clarify that the State in a primacy State or the EPA in a non-primacy State under Subpart C of the NIPDWR has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by their sanctioned representatives and agencies.

In addition, a statement is being proposed to be included in the NIPDWR which would clarify that the water supplier would submit upon request to the State any records required to be maintained by the NIPDWR.

Corrosion Control

Section 141.30 is being added to require community water systems, as designated by the State, to carry out a corrosion control program which would initially identify the presence and source of corrosion products and follow with implementation of corrosion control measures. It is expected that States would designate only those systems that have problems with corrosive waters, and the amendment requires designation and initiation of the corrosion control program within 18 months of promulgation.

The corrosivity of drinking water is a parameter which has significant health and economic aspecs as well at aesthetic significance. The products of corrosion involving the aesthetic factor are dealt with in the National Secondary Drinking Water Regulations. Corrosivity is addressed in the primary regulations on the basis of health effects associated with the presence of such contaminants as metals and organic compounds being products of corrosion in the distribution system.

The question of the contribution of waterborne contaminants as opposed to air, food and dust sources on the total body burden, is being carefully examined. It is clear, however, in many circumstances, elevated lead levels, as well as elevated levels of cadmium, copper, zinc, asbestos and organic compounds in drinking water are caused by leaching from distribution systems as the result of the corrosive action of water.

Water supply systems distributing soft, aggressive waters are the most vulnerable to contamination by