# JUNEAU FLUORIDE STUDY COMMISSION

## REPORT TO ASSEMBLY
OF THE
CITY AND BOROUGH OF JUNEAU

### JULY 11, 2006

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SUMMARY OF RECOMMENDATIONS

The Juneau Fluoride Commission is divided in its recommendations. After extensive study and constructive dialogue among Commission members, we are submitting three position papers to the Mayor and Assembly. Three members recommend continuing municipal water fluoridation in the range of 0.7 to 0.9 mg/L, believing that such fluoridation is safe and effective in helping to prevent dental caries. Two members oppose continued fluoridation, contending that fluoridation is potentially harmful and that its effectiveness against dental caries is doubtful. The final member believes that the available evidence slightly supports the argument that fluoridation is safe and effective, but that the studies to date do not adequately address the effects of fluoridation in the volumes used by municipalities. As a result, the level of uncertainty is too high to support a recommendation for continued fluoridation.

THE COMMISSION’S MEMBERSHIP AND CHARGE

The CBJ Fluoride Study Commission was created by motion of the Assembly and appointed by Mayor Bruce Botelho. The Commission members are:


Jamie Bursell, B.S. in Psychology, University of Idaho. Human Anatomy and Physiology instructor for medical school and undergraduate students, certified Clinical Exercise Specialist, certified Personal Trainer.

Deborah Erickson. B.S. in Earth Science, Pacific Lutheran University. Deputy Director, Alaska Division of Public Health. 20 years experience in community health planning and policy development.

Ronald Hansen. Professional Engineer, B.C.E., M.S. (Civil Engineering), M.P.A.

Dr. Emily Kane. B.A., Harvard University. Masters and Doctorate degrees from Bastyr University, Seattle, WA. Family doctor practicing naturopathic medicine in Juneau since 1994.
Dr. Eric Paulsen. Oral and Maxillo Facial Surgeon.

Ethel Lund was appointed to the Commission but resigned for personal reasons. A replacement member was not appointed.

The Commission was asked:

1. To research and evaluate the scientific literature regarding the use of fluoride in municipal drinking water.

2. To research and evaluate the process used by other municipalities in making decisions regarding fluoridation of municipal drinking water.

3. To perform a cost/benefit analysis and risk analysis regarding the use of fluoride in municipal drinking water.

4. To make recommendations to the Mayor, City Manager, and Assembly, regarding the use of fluoride in CBJ drinking water.

SUMMARY OF COMMISSION’S ACTIONS

The Commission was appointed and began work in June of 2004, and met monthly or more often into 2005. The members collected studies and reports and were provided with many other materials by interested citizens. In all, the Commission reviewed hundreds of documents.

A recorded public hearing was held on July 29, 2004, at which over 25 citizens testified on both sides of the fluoridation issue. A panel discussion was held at Centennial Hall on December 16, 2004, with six informed advocates, three representing each side of the discussion. The panel presentation included an opportunity for public questions. In addition, public participation was permitted at each of the Commission’s meetings.

The Commission’s scheduled reporting date was extended until February 15, 2005. On that date the Commission submitted an interim report, together with Appendices A through F (two appendices labeled “A” were included), which addressed the research done and the literature studied on several issues, including each of the issues identified in the Commission’s charge. The Commission’s interim report with appendices is attached as Exhibit A.

In its interim report, four members of the Commission recommended that preparation of a final report be deferred until after a major report on fluoride toxicology was concluded by the National Research Council (NRC), the research organization for the National Academy of Sciences (NAS). The report was then scheduled for completion in May
2005. During that time the four members recommended that water fluoridation be continued by CBJ. Two members of the Commission recommended that fluoridation be discontinued immediately.

NRC extended the date for completion of its report multiple times after that. During that time, the Commission reviewed new information and received additional extensions of time to complete its final report. The NRC report was finally released on March 22, 2006. Following its release the Commission met several times to review the report in detail. Other new materials were also reviewed. The Commission then drafted this report, including three subcommittee reports, to the Mayor and Assembly.

**BRIEF SUMMARY OF THE CONCLUSIONS OF THE NATIONAL RESEARCH COUNCIL**

The NRC report is the most comprehensive compilation and analysis of literature on fluoridation done to date. The full report is about 500 pages long. A copy of the NRC Report in Brief is attached to this Commission report as Exhibit B. In summary, the NRC report concludes that the Environmental Protection Agency’s (EPA) maximum allowable level for fluoride in drinking water, established in 1986, of 4 mg/L, is not adequately protective of health and should be reduced. 4 mg/L is the level designed to protect the public from being exposed to harmful levels of fluoride.

NRC also found that from a cosmetic standpoint, EPA’s standard of 2 mg/L does not adequately prevent the occurrence of moderate enamel fluorosis.

However, NRC “did not evaluate the risks or benefits of the lower fluoride concentrations (0.7 to 1.2) mg/L used in water fluoridation. Therefore, the committee’s conclusions regarding the potential for adverse effects from fluoride at 2 to 4 mg/L in drinking water do not apply at the lower fluoride levels commonly experienced by most U.S. citizens.” Report in Brief (Exhibit B), p. 4.

**ACTIONS TAKEN BY OTHER JURISDICTIONS ON FLUORIDATION**

Attached as Exhibits C-1 through C-5 are summaries of actions taken by other municipalities within Alaska and throughout the United States on whether or not to fluoridate water supplies. The decisions by these other jurisdictions are divided on whether to fluoridate. Most of Europe does not fluoridate its drinking water, as discussed in the Kane/Bursell report opposing fluoridation. Most of those European countries have alternative government provided dental caries protection programs, such as regular provision of fluoride rinse to children in schools, or fluoridation of table salt.
COST BENEFIT ANALYSIS

Attached as Appendix B to the Commission’s February 14, 2005, Interim Report (Exhibit A to this report) is a literature summary on the cost/benefit issue. Exhibit D is a list of documents on file with the Clerk which are too voluminous to attach to this report. Documents D-5(a) through (l) in the collection with the Clerk are a dozen papers that address cost/benefit questions in Juneau, Alaska and other jurisdictions. The Commission does not have data or funding sufficient to prepare a separate cost/benefit analysis for Juneau.

RECOMMENDATION

Three separate reports by Commission members follow. Three members support continued fluoridation, believing it to be safe and effective in helping to prevent dental caries. Two members recommend that fluoridation be discontinued, believing it to be potentially unsafe and of doubtful efficacy in fighting tooth decay. The final member recommends that fluoridation be discontinued because the evidence does not show fluoridation to be safe and effective with sufficient certainty.

The NRC report includes information that can be cited by both sides to support their viewpoints. The NRC report lists hundreds of documents it consulted in preparing its report, which are also divided in their conclusions and recommendations. The documents attached as exhibits to this report, and those additional documents listed in Exhibit D and on file with the clerk, address both sides of the issue. The Commission also reviewed a great volume of other documents, most of which are also on file with the clerk, that presented viewpoints on both sides. Given this division in the literature and public opinion, it is perhaps not surprising that the members of this Commission are also divided in the recommendations. Despite the absence of a clear cut majority position from the Commission, we are hopeful that the information provided in these reports and supporting documents will be helpful to the Mayor and Assembly.

The Commission members will be available to answer any questions the Mayor and Assembly may have. We appreciate the opportunity to have worked on this Commission. In addition, the members wish to note that we have at all times worked cooperatively with each other and respect the sincere viewpoints of all members despite the differing conclusions we have reached.
Introduction

1. HISTORY: The City and Borough of Juneau (CBJ) has been fluoridating the City public water supply for decades. Estimated annual cost of equipment maintenance is $65,000 and annual cost for the sodium fluoride is $29,000, totaling $94,000 annually. Estimated cost for a new storage facility for the sodium fluoride ranges between $150,000 to $200,000. Questions have been raised concerning the efficacy and safety of fluoridating the water supply.

2. OBJECTIVE: In an analysis of the subject one would derive an overall objective and subsidiary objectives, as follows:

   The overall objective of the City and Borough of Juneau is to provide for good dental health of the citizens of the CBJ. A subsidiary question is to determine if the City should continue to fluoridate the water system as a community-based strategy to prevent dental caries, or not to fluoridate. If fluoridation, at what concentration? If not, what harm would result and what programs are to be developed, by whom, and at what cost?1

   The CBJ created an ad hoc citizen advisory commission to address these questions in June 2004. The stated charge to the commission is as follows:
   a) “To research and evaluate the scientific literature regarding the use of fluoride in municipal drinking water.
   b) To research and evaluate the process used by other municipalities in making decisions regarding fluoridation of municipal drinking water.
   c) To perform cost/benefit and risk analysis regarding the use of fluoride in municipal drinking water.
   d) To make recommendations to the Mayor, City Manager, and Assembly regarding the use of fluoride in CBJ drinking water.”

3. EXECUTION: CBJ Mayor Bruce Botelho appointed the Fluoride Study Commission in June 2004 to respond to the charge stated above. The Commission met regularly for the first six months and reviewed extensive materials presented on both sides of the fluoridation argument. An interim report was produced February 2005. At that time the Commission recommended (4 members in support, 2 opposing) continuing fluoridation of Juneau’s water supply

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1 See the letter to Chairman Rozell from Dr. Brad Whistler of the Alaska Department of Health and Social Services relating to potential harm done by termination of fluoridation (Exhibit E-1).
at current levels (0.7 to 0.9 mg/l, which concentration is at the lower end of the range recommended by the US Public Health Service of 0.7 to 1.2 mg/l). Production of a final report was held pending completion and release of a National Research Council (NRC) study underway at that time, commissioned by the Environmental Protection Agency to review existing literature and recommend changes to EPA standards for fluoride in drinking water.

Following release of the NRC report in March of this year the Commission met a number of times to discuss the findings and recommendations from that report. At this point in time, as the Commission is finalizing its report, members are split three ways in regards to their findings and recommendations. Three members find that fluoridation of the public water system is a safe, efficacious, and cost-effective community-based strategy for prevention of dental caries, and recommends continued fluoridation of the CBJ public water system. Two members oppose continued fluoridation on the basis they feel it is unsafe and not effective. One member, the Chair of the Commission, recommends against continued fluoridation based on the belief that insufficient research has been conducted in his opinion to prove the fluoridation to be safe and effective.

Following is the Report from the three Commission members who recommend in favor of continued fluoridation.

Report of the  
CBJ Fluoride Study Commission Subcommittee  
in favor of Continued Fluoridation of the CBJ Public Water Supply

Findings

National Research Council Report on Fluoride

The National Research Council (NRC) report (released in March 2006) addressed the Environmental Protection Agency’s (EPA’s) fluoride limits, the maximum contaminant limit (MCL) of 4 mg/l, the maximum contaminant level goal (MCLG) of 4 mg/l, and secondary maximum contaminant limit (SMCL) of 2 mg/l. Note that these are upper limits, and above the concentrations recommended by the US Public Health Service (USPHS) as safe and effective for public water fluoridation (0.7 mg/l to 1.2 mg/l). No conclusions were made to fluoridate or not, but the report recognized fluoride’s anti-decay effect. NRC’s recommendations were that EPA should lower the MCLG of 4 mg/l and that EPA should reevaluate the SMCL of 2 mg/l.

The NRC report recognized, but did not address, the USPHS recommendation that community water fluoridation at 0.7 to 1.2 mg/l is safe and effective at reducing dental decay. The NRC report did not negate the Commission’s findings and conclusions, and it implicitly supported community water fluoridation in that no dangers were apparent in that practice at the concentrations recommended by the USPHS.
More detailed subcommittee comments on the NRC report are included as an attachment to this report. The subcommittee finds that the NRC report provides a comprehensive literature review on the subject of the human health effects of higher levels of fluoride concentration in drinking water, and that the NRC report does not negate the CBJ Fluoride Commission’s interim report and recommendation that fluoridation of Juneau’s public water system should continue.

Cost Benefit

The CBJ Fluoride Study Commission’s review found that the cost-benefit ratio was positive, that is fluoridation of the water supply is the most economical alternative method to provide for community dental health. (See the attached report on cost/benefit analysis). The unique benefit to fluoridating the public water supply is that the whole population is provided good dental health.

Conspiracy Theories

A claim in many of the materials received and reviewed by the Commission supporting discontinuation of fluoridation is that the government agencies and professional medical and dental associations that advocate for fluoridation are covertly conspiring with private industry to force fluoride on communities, knowing it to be unsafe.

No credible evidence was found by this subcommittee to support such claims. No reasonable argument or evidence exists to explain why so many different and separate government and private professional science-based organizations would actively advocate for this strategy unless they were certain that it is safe and effective. This subcommittee finds that no conspiracies exist and that the organizations supporting fluoridation based their recommendations on scientific evidence.

Other Cities’ Fluoridation Practices and Processes

Other communities’ fluoridation practices and decision-making processes were of interest to the Commission both for the purposes of learning from others’ work and experience, and because it was part of the Commission’s charge.

46 (possibly up to 48 now) of the 50 largest cities in the United States have fluoridated water supplies.2 62% of the population of the United States is on a fluoridated public water system. Many communities (197 between the years 1998 – 20053) have moved to

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2 National Center for Fluoridation Policy & Research, March 3, 2001
3 American Dental Association/Association of State & Territorial Dental Directors/Centers for Disease Control & Prevention 1999 – 2006 Fluoridation Awards Brochure
begin, or voted or otherwise decided to retain, fluoridation in recent years. As well, a number have decided to discontinue fluoridation (95 U.S. communities during the same time period\textsuperscript{4}).

This subcommittee finds that, in many of the cases where communities decided for discontinuation of fluoridation, the decision was based on philosophical objections and not on scientific evidence finding the practice to be unsafe and/or ineffective.

**CBJ Fluoridation Decision-Making Process**

A subsidiary question that emerged at times during discussions at public meetings of the Commission was whether the Commission was charged with recommending to the Assembly and Mayor the process by which this public policy question should be settled for CBJ; specifically, whether the Commission should recommend this question go to referendum.

While this subcommittee supports the right of the CBJ citizenry to bring this question to a vote of the people through petition, we recommend against it as the first choice decision-making process for the Assembly and Mayor, for two reasons. 1) This subcommittee finds that there is considerable misinformation and fear being spread through the Internet by anti-fluoridation activists, thereby making it more difficult for the electorate to make an informed decision. 2) The subpopulation that will be the most significantly harmed by discontinuation of fluoridation, underprivileged children,\textsuperscript{5} is one that would have no voice in a municipal election. It is incumbent on the Assembly and Mayor, and appropriate to our representative form of government, to take the needs of all in our community under consideration and make the decision for our community that supports the common good.

**Perceptions of Risk and Scientific Certainty**

Community members and Commissioners who object to fluoridation at least partly base their arguments on 1) perceived absence of proof that fluoridation at the current level is safe, and 2) belief that, lacking absolute proof to the contrary, there is some level of risk posed to the public through fluoridation, and that if there is any chance at all that some risk exists, the city should not fluoridate.

Members of this subcommittee find that much of the uncertainty about safety of fluoridation is fueled by studies that evaluated the affects of very high levels of fluoride exposure, and perceptions that something toxic at very high levels may be unsafe at any level.


Because safety cannot be proved with absolute certainty, the weight of evidence must be considered. This subcommittee finds that the weight of evidence provided through 50 years of experience with fluoridation of public water systems, and the body of research provided in the materials studied, provides sufficient proof that fluoridation at current levels is safe and is effective at preventing dental caries.

Individual Rights vs. Common Good

The question of whether fluoridation constitutes an infringement on individual rights has also come up periodically in the course of the Commission’s discussions. This is a classic public policy question. Government can rarely act to fulfill its role in serving the public without somehow infringing on the rights of the individuals they serve, whether through taxation to benefit the community through maintenance of a fire department, or laws against driving while intoxicated. People who live together in a free and civil society have a duty to one another and the community in which they live to sacrifice certain liberties for the common good. It is the duty of government decision-makers to fairly balance civil liberty and sacrifices demanded of individuals for the good of the community. This subcommittee finds that the objections of individuals in our community who have personal interests against fluoridation, are outweighed by the public benefit of continued fluoridation.

A related question that has been raised to the Commission a number of times is regarding the legality of fluoridation. It should be noted that the legality of fluoridation in the United States has been tested many times over the years, and the court of last resort has never rendered an opinion against fluoridation, in general finding that a significant government interest in health and welfare of the public outweighed individual objections. The U.S. Supreme Court has denied review of fluoridation cases thirteen times, citing that no substantial constitutional questions were involved – rejecting contentions that fluoridation violates individual freedoms guaranteed under the Constitution.

Alaska State House Concurrent Resolution 5
Reference is made to Alaska State House Concurrent Resolution No.5, passed by the House in March, “Relating to support of community water fluoridation”. (See copy, attached.) As shown in the supporting material, over 90 national and international organizations recognize the public health benefits of community water fluoridation for preventing dental decay. Significantly, this list includes the American Medical Association, the American Cancer Society, and the American Water Works Association.

Recommendations

This Commission Subcommittee, consisting of the Commission’s experts in water supply, oral medicine, and public health, recommend that the City and Borough of
Juneau’s Assembly and Mayor direct the City Manager to continue to fluoridate the City domestic water supply using sodium fluoride, such that the concentration of fluoride in the water delivered to the public will be within the range of 0.7 mg/l to 0.9 mg/l. This is the present range of fluoride concentration, and as noted is at the low end of the USPHS recommendations.
Comments on the March 2006 National Research Council Report
FLUORIDE IN DRINKING WATER

The CBJ Fluoride Study Commission Subcommittee in favor of continued fluoridation presents the following comments on each chapter of the National Research Council’s recent report on fluoride in drinking water. The NRC report itself contains a 10 page summary before Chapter 1, and in addition includes “Findings” after each chapter.

Chapter 1 - Introduction:
A description of fluoride in drinking water brought out the wide range of natural fluoride and the practice of fluoridation using USPHS recommendations. NRC recognized the USPHS recommendations, but did not address them, since the NRC objectives were to address the EPA limits. EPA has adopted limits on fluoride in drinking water, a Maximum Contaminant Level Goal, a Maximum Contaminant Level, and a Secondary Maximum Contaminant Level. The Council’s task was to evaluate the adequacy of EPA’s limits and guidelines “to protect children and others from adverse health effects”.

Chapter 2 – Measures of Exposure to Fluoride in the United States
Evaluations were made of various sources of fluoride to individuals, and reported as mg/body weight per day, with estimated water consumption at various ages and ambient temperatures. It is important to evaluate fluoride intake from all sources, for example, food and beverages, fluoride supplements, and, for children, toothpaste ingestion. Historical limits of fluoride exposure were researched.

Chapter 3 – Pharmacokinetics of Fluoride
A review was presented of the body’s absorption, distribution, and elimination of fluoride. Bone fluoride concentrations were calculated to increase with both magnitude and exposure. The calculations were based on concentrations of fluoride at 4 mg/l, the MCLG for which the Council was tasked to evaluate. Groups likely to have increased bone fluoride include the elderly and people with severe kidney insufficiency.

Chapter 4 – Effects of Fluoride on Teeth
Enamel fluorosis is a mottling of the tooth surface that is attributable to fluoride exposure during tooth formation. One of the functions of tooth enamel is to protect the dentin and, ultimately, the pulp from decay and infection. Severe enamel fluorosis compromises this health-protective function causing structural damage to the tooth. NRC stated it is no longer appropriate to characterize enamel pitting as a cosmetic effect. With fluoride concentrations at or near the MCLG of 4 mg/l approximately 10% of children in U.S. get severe enamel fluorosis. At 2mg/l, EPA’s secondary limit, severe enamel fluorosis is near zero.

Chapter 5 - Musculoskeletal Effects
Fluoride is a biologically active ion with demonstrable effects on bone cells. Fluoride concentrations in water at 2 or 4 mg/l might not protect all individuals from the adverse
effects of stage II and stage III skeletal fluorosis. It is important to note that so few clinical cases of skeletal fluorosis exist in the U.S. (only 5 cases of stage III were documented between 1960 and 1997), the NRC had to use modeling to develop projections of effects at high levels of fluoride exposure. The majority of the NRC committee found that lifetime exposure to fluoride in drinking water at 4 mg/l is likely to increase fracture rates compared to exposure at 1 mg/l, while a minority would only find that research is not sufficient to prove fluoride is not protective against fractures. Data to assess bone fracture rates at 2 mg/l are inadequate.

Chapter 6 – Reproductive and Developmental Effects of Fluoride
Adverse and developmental outcomes occur only at very high concentrations of fluoride, and not at low level fluoride concentrations.

Chapter 7 – Neurotoxicity and Neurobehavioral Effects
High fluoride concentrations affect neurotoxicity and neurobehavior. The chapter described findings relating to those effects, but the NRC concluded the findings had insufficient details to have any confidence in the findings.

There were reports that fluorosilicates enhance the uptake of lead in the body and brain, whereas sodium fluoride does not. Fortunately the City and Borough’s water supply system is fluoridated with sodium fluoride. Aluminofluoride complexes affect transmitter concentrations and functions of the central nervous system. There is the possibility that fluorides act to increase the risk of developing Alzheimer’s disease. The NRC recommended more research is needed at fluoride concentrations at and above EPA’s maximum levels.

Chapter 8 – Effects on the Endocrine System
Evidence of several types indicates that fluoride affects normal endocrine (such as thyroid, pituitary, and adrenal glands) function or response, the effects of which vary in degree and kind with different individuals, and in relation to other factors, such as calcium and iodine. Further research is needed at fluoride concentrations at and above EPA’s maximum levels.

Chapter 9 – Effects on the Gastrointestinal, Renal, Hepatic, and Immune Systems
There are a few case reports of GI upset in subjects exposed to drinking water fluoridated at 1 mg/l. There are no studies on drinking water containing fluoride at 4 mg/l in which GI systems were carefully documented. In the United Kingdom, where tea drinking is common, people can consume up to 9 mg of fluoride a day. (Tea has one of the highest concentrations of fluoride.) GI symptoms were not reported in the tea drinkers.

The kidney is the organ responsible for excreting most of the fluoride. There are no published studies that show that fluoride ingestion at 1 mg/l on a chronic basis, drinking 1 liter/day, at that concentration (equivalent to 1 mg/day) can affect the kidney. However studies have shown that consuming 12 mg per day would increase the risk for some people to develop adverse renal effects.
Chapter 10 – Genotoxicity and Carcinogenicity
Available literature does not clearly indicate that fluoride either is or is not carcinogenic in humans. One analytic study of osteosarcoma has been published, but data were not included, so the study is inconclusive. Further research is needed on bladder cancer, since bladder cancer is relatively common compared to osteosarcoma. Other directed research was recommended relative to the maximum allowable fluoride concentrations.

Chapter 11 – Drinking Water Standards for Fluoride
The procedures for setting EPA’s three standards for fluoride were discussed. EPA’s standards are the maximum contaminant level goal (MCLG) of 4mg/l, the maximum contaminant level (MCL) of 4 mg/l, and the secondary maximum contaminant level (SMCL) of 2 mg/l. The task of NRC was to reevaluate these levels. NRC’s task did not relate to the concentration levels of fluoride recommended by USPHS of 0.7 mg/l to 1.2 mg/l for drinking water, although this was mentioned but not addressed. Evidence suggests that the MCLG might not protect all individuals from adverse conditions of skeletal fluorosis. For noncarcinogenic chemicals, the MCLG is based on the reference dose, which is defined as an estimate (with uncertainty spanning perhaps an order of magnitude or greater) of a daily dose to the human population (including susceptible subpopulations) that is likely to have no appreciable effects during a lifetime. The NRC concluded that the MCLG of 4 mg/l is not protective against severe enamel fluorosis of teeth, an adverse health effect. NRC concludes that the MCLG of 4 mg/l should be lowered.

Strong evidence exists that the prevalence of severe enamel fluorosis is nearly zero at water fluoride concentrations to below 2 mg/l. The SMCL of 2 mg/l is not a recommendation to add fluoride to drinking water. The NRC evaluated the SMCL only in terms of its protection against adverse cosmetic and health effects, including enamel fluorosis, skeletal fluorosis, and bone fracture. Prevention of caries was not evaluated. The NRC concluded that the SMCL of 2 mg/l adequately protects the public from the most severe stage of enamel pitting.
REPORT TO THE MAYOR AND ASSEMBLY BY FLUORIDE COMMISSION
MEMBERS KANE AND BURSELL RECOMMENDING AGAINST CONTINUED
FLUORIDATION OF OUR MUNICIPAL WATER

After nearly two years of research, study and debate, two members of the commission
strongly urge the CBJ Assembly to discontinue fluoridation of the municipal water. Over
the two years, several members of the CBJ community have attended our meetings
almost as regularly as commissioners. These public representatives are overwhelmingly
in favor of cessation of the inappropriate and very possibly dangerous, to certain
segments of the community, practice of adding sodium fluoride to our public drinking
water. Fluoride is not an essential nutrient. No disease has ever been linked to a fluoride
deficiency. Humans can have perfectly good teeth without fluoride. Sodium fluoride is
an extremely toxic substance. Both children (swallowing gels) and adults (accidents
involving malfunctioning of fluoride delivery equipment and filters on dialysis machines)
have died from excess exposure.

We recognize these statements are strong, but they are not meant to be contentious.
Bucking the status quo requires more energy than simply carrying on an established
practice. Fluoridation of municipal water, like mass production of rolled cigarettes, may
have seemed like a great idea at inception. No longer. Most European communities have
abandoned the addition of sodium fluoride to their community water (1) because, upon
close scrutiny, the impact of this practice on dental caries rates is debatable. (2-6)
In fact, some research points to tooth decay declining less rapidly in communities who
continue to fluoridation. (7) Regardless of fluoridation, rates of dental caries have
continued to decline, as is the universal trend, because of greater understanding of the
importance of oral hygiene and of the impact of sugary or acidic foods on the dental
enamel. (8) Rates of caries continue to be higher in communities who lack the education
or funding to seek dental care.

A large and growing body of evidence suggests fluoridation may be more harmful than
previously thought. New research shows that young boys are 5 times more susceptible to
a rare form of bone cancer when exposed to relatively low levels of sodium fluoride. (9)
Young children, and infants in particular, in fluoridated communities, are receiving a
total load of sodium fluoride exponentially beyond levels considered safe. (10) A fairly
recent study (Caries Research, Sept-Oct 2004) from Ireland showed that 5% of infants
drinking 1 part per million of fluoridated water received more than 0.2-0.26 mg/kg/day
from water because of the relative ratio of water consumer per their small body weight.
This is particularly true for bottle-fed infants. From the long-awaited and recently
published “Fluoride in Drinking Water: A Scientific Review of EPA’s Standards”
(National Research Council of the National Academies), page 47, referring to children
ages 1-2 and 3-5 years old, it is noted that “at 1mg/L (which is equivalent to 1 part per
million – the accepted standard for community water), the drinking water contribution is
approximately 42%, while the contributions from toothpaste and background food are
(also) sizeable, approximately 18% and 31% respectively.” Additionally, as stated in the
NRC report, “On a per-body-weight basis, infants and young children have
approximately three to four times greater exposure than do adults.” We believe CBJ
should not be adding to this burden, particularly in this vulnerable population – our young children.

You, as guardians of public safety are admonished to consider not only the obscure and antiquated use of fluoride to harden the dental enamel of children, but also to deeply ponder the impact of purposefully placing a poison and known neurotoxin into our drinking water. Besides the very young, people with kidney problems are at particular risk (renal compromise is the next biggest cost to Medicare after diabetes in the US, and these two pathologies overlap considerably). We also know fluoride depresses thyroid function in the dose range of 2.3 – 4.5 mg/daily (24), a dose easily achieved by drinking normal amounts of “optimally” fluoridated water. Earlier in the 20th century, fluoride was prescribed by medical doctors to reduce symptoms of hyper (over-active) thyroid (Graves’ disease). (25) With water fluoridation, we are forcing people to drink a thyroid-depressing medication which could promote higher levels of hypothyroidism (under-active metabolism) in the population, and all the subsequent problems related to this disorder such as depression, fatigue, weight gain, menstrual abnormalities, muscle and joint pain, increased cholesterol levels and heart disease.

The principal tenet of the Hippocratic Oath is “Do No Harm.” We believe fluoridating the municipal water violates this oath. All other medication is carefully studied for potential harm, and then carefully administered to those patients who are judged by medical experts to need this medication. These medical experts then periodically evaluate their patients taking prescription medication for signs of deleterious side-effects. This is not happening with fluoride. Why not?

Fairly recent Chinese studies, given credence by the National Research Council report referenced above, clearly show lower IQ (and other parameters of intellectual function) in children from fluoridated communities. From page 6 of the study, “Consistency of (the Chinese) study results appears significant enough to warrant additional research on the effects of fluoride on intelligence.” IQ deficits, the NRC committee noted, have been strongly associated with dental fluorosis, a condition caused by fluoride in tap water. (page 175, 2006 NRC report)

The NRC report assiduously avoided addressing the 0.7 to 1.2 parts per million level of fluoridation. They specifically addressed higher levels of fluoridation and strongly urged the US government to take measures lower the maximum contaminant level goal (MCLG) below 4 parts per million. In looking at the impact of fluoride on immunological, intellectual, reproductive, musculoskeletal, renal etc. development and health, the general conclusion of the NRC committee was that “more research was needed.” These commission members contend that without further research, community officials have no right to impose this potential toxin on the general population.

Please recognize that there may well be additional risks we don’t yet know about, just like with lead, or tobacco, or driving without seatbelts. From a purely biochemical perspective, at equal parts per million, fluoride is considered slightly more toxic to the
human body than lead. (26) However, illogically, the standards for lead contamination of our water are much more stringent (lower) than the standards for fluoride. (27)

These commission members are not confident that fluoride is safe for all segments of the population. We object to what amounts to compulsory ingestion of sodium fluoride by the entire CBJ population. We believe, despite OSHA regulations, that the workers in our water treatment facilities are at risk for excessive fluoride exposure. Fifty percent of ingested fluoride bio-accumulates definitively, meaning it never leaves the body, bonding extremely tightly to bone, nerve, renal and other tissues. We have absolutely no idea what the total load of fluoride amounts to in any given person. Given the known risks, particularly to infants and those with compromised kidneys, what right do you have to increase these involuntary health hazards? Most of the rest of the civilized world has abandoned fluoridation as a crude, indirect, and potentially harmful approach to tooth decay. It is no longer a good idea. We strongly urge the Assembly to recommend against continued fluoridation of our drinking water.

REFERENCES

1) Statements on fluoridation by governmental officials from several countries:

Germany:

"Generally, in Germany fluoridation of drinking water is forbidden. The relevant German law allows exceptions to the fluoridation ban on application. The argumentation of the Federal Ministry of Health against a general permission of fluoridation of drinking water is the problematic nature of compulsory medication." (Gerda Hankel-Khan, Embassy of Federal Republic of Germany, September 16, 1999). www.fluoridealert.org/germany.jpeg

France:

"Fluoride chemicals are not included in the list [of 'chemicals for drinking water treatment']. This is due to ethical as well as medical considerations." (Louis Sanchez, Directeur de la Protection de l'Environment, August 25, 2000). www.fluoridealert.org/france.jpeg

Belgium:

"This water treatment has never been of use in Belgium and will never be (we hope so) into the future. The main reason for that is the fundamental position of the drinking water sector that it is not its task to deliver medicinal treatment to people. This is the sole responsibility of health services." (Chr. Legros, Directeur, Belgaqua, Brussels, Belgium, February 28, 2000). www.fluoridation.com/c-belgium.htm

Luxembourg:

"Fluoride has never been added to the public water supplies in Luxembourg. In our views, the drinking water isn't the suitable way for medicinal treatment and that people needing an addition of fluoride can decide by their own to use the most appropriate way, like the intake
of fluoride tablets, to cover their [daily] needs." (Jean-Marie RIES, Head, Water Department, Administration De L'Environment, May 3, 2000). www.fluoridealert.org/luxembourg.jpeg

Finland:

"We do not favor or recommend fluoridation of drinking water. There are better ways of providing the fluoride our teeth need." (Paavo Poteri, Acting Managing Director, Helsinki Water, Finland, February 7, 2000). www.fluoridation.com/c-finland.htm

"Artificial fluoridation of drinking water supplies has been practiced in Finland only in one town, Kuopio, situated in eastern Finland and with a population of about 80,000 people (1.6% of the Finnish population). Fluoridation started in 1959 and finished in 1992 as a result of the resistance of local population. The most usual grounds for the resistance presented in this context were an individual's right to drinking water without additional chemicals used for the medication of limited population groups. A concept of "force-feeding" was also mentioned.

Drinking water fluoridation is not prohibited in Finland but no municipalities have turned out to be willing to practice it. Water suppliers, naturally, have always been against dosing of fluoride chemicals into water." (Leena Hiisvirta, M.Sc., Chief Engineer, Ministry of Social Affairs and Health, Finland, January 12, 1996.) www.fluoridealert.org/finland.jpeg

Denmark:

"We are pleased to inform you that according to the Danish Ministry of Environment and Energy, toxic fluorides have never been added to the public water supplies. Consequently, no Danish city has ever been fluoridated." (Klaus Werner, Royal Danish Embassy, Washington DC, December 22, 1999). www.fluoridation.com/c-denmark.htm

Norway:

"In Norway we had a rather intense discussion on this subject some 20 years ago, and the conclusion was that drinking water should not be fluoridated." (Truls Krogh & Toril Hofshagen, Folkhelsa Statens institutt for folkeheise (National Institute of Public Health) Oslo, Norway, March 1, 2000). www.fluoridation.com/c-norway.htm

Sweden:

"Drinking water fluoridation is not allowed in Sweden...New scientific documentation or changes in dental health situation that could alter the conclusions of the Commission have not been shown." (Gunnar Guzikowski, Chief Government Inspector, Livsmedels Verket -- National Food Administration Drinking Water Division, Sweden, February 28, 2000). www.fluoridation.com/c-sweden.htm

Netherlands:
"From the end of the 1960s until the beginning of the 1970s drinking water in various places in the Netherlands was fluoridated to prevent caries. However, in its judgement of 22 June 1973 in case No. 10683 (Budding and co. versus the City of Amsterdam) the Supreme Court (Hoge Road) ruled there was no legal basis for fluoridation. After that judgement, amendment to the Water Supply Act was prepared to provide a legal basis for fluoridation. During the process it became clear that there was not enough support from Parliament [sic] for this amendment and the proposal was withdrawn." (Wilfred Reinhold, Legal Advisor, Directorate Drinking Water, Netherlands, January 15, 2000). www.fluoridation.com/c-netherlands.htm

Northern Ireland:

"The water supply in Northern Ireland has never been artificially fluoridated except in 2 small localities where fluoride was added to the water for about 30 years up to last year. Fluoridation ceased at these locations for operational reasons. At this time, there are no plans to commence fluoridation of water supplies in Northern Ireland." (C.J. Grimes, Department for Regional Development, Belfast, November 6, 2000). www.fluoridealert.org/Northern-Ireland.jpeg

Austria:

"Toxic fluorides have never been added to the public water supplies in Austria." (M. Eisenhut, Head of Water Department, Osterreichische Vereinigung für das Gas-und Wasserfach Schubertring 14, A-1015 Wien, Austria, February 17, 2000). www.fluoridation.com/c-austria.htm

Czech Republic:

"Since 1993, drinking water has not been treated with fluoride in public water supplies throughout the Czech Republic. Although fluoridation of drinking water has not actually been proscribed it is not under consideration because this form of supplementation is considered:

- uneconomical (only 0.54% of water suitable for drinking is used as such; the remainder is employed for hygiene etc. Furthermore, an increasing amount of consumers (particularly children) are using bottled water for drinking (underground water usually with fluor)
- uneconomical (environmental load by a foreign substance)
- unethical ("forced medication")
- toxicologically and physiologically debateable (fluoridation represents an untargeted form of supplementation which disregards actual individual intake and requirements and may lead to excessive health-threatening intake in certain population groups; [and] complexation of fluor in water into non biological active forms of fluor." (Dr. B. Havlik, Ministerstvo Zdravotnictvi Ceske Republiky, October 14, 1999). www.fluoridealert.org/czech.jpeg

3) Sales-Peres SH, Bastos JR. “There was no statistically significant difference between DMFT in municipalities of the same size, regardless of the presence or absence of fluoride in the water supply.” An epidemiological profile of dental caries in 12-year-old children residing in cities with and without fluoridated water supply in the central western area of the State of Sao Paulo, Brazil. Cadernas de Saude Publica 18:1281-8. (2002)


5) Harding MA et al. “In lifetime residents of fluoridated areas 47% had evidence of erosion; in 21% erosion has progressed to the dentine or pulp. The corresponding figures in non-fluoridated areas were 43% and 21% respectively...Levels in fluoridated and non fluoridated areas were similar.” Dental erosion in 5-year-old Irish school children and associated factors: a pilot study. Community Dental Health 20(3):165-70 (2003)

6) Limeback, H. “The small benefit that remains today from water fluoridation can, in part, be explained by fluoride ingestion retarding tooth eruption, resulting in a delay in dental caries. The effect of the delay in tooth eruption from systemic fluoride is likely less evident in more recent fluoridation studies because of increasing ingestion of other sources of fluoride such as fluoridated dentifrices.” University of Toronto, Canada. Oral Issues, Toxicology II, IADR/AADR/CADR 80th General Session San Diego, CA March 6-9, 2002.


8) Leverett DH “During the past 40 years dental caries has been declining in the US, as well as in most other developed nations of the world…The decline in dental caries has occurred both in fluoride and in fluoride-deficient communities, lending further credence to the notion that modes other than water fluoridation, especially dentifrices, have made a major contribution.” Appropriate uses of systemic fluoride: considerations for the ‘90s. Journal of Public Health Dentistry. 51:42-7 (2004)

9) Bassin EB. Association Between Fluoride in Drinking Water During Growth and Development and the Incidence of Osteosarcoma for Children and Adolescents "Among males, exposure to fluoride at or above the target level was associated with an increased risk of developing osteosarcoma. The association was most apparent between ages 5-10 with a peak at six to eight years of age. The odds ratio for the high exposure group was 5.16 at 7 years of age with a 95 percent confidence interval of 1.64 to 16.20... Figure 3.2 shows that the results continue to demonstrate an effect after adjusting by zipcode, county population, ever use of bottled or well
water, age, and any use of self-administered fluoride products. For males, the odds ratio for the high exposure group was 7.20 at 7 years of age with a 95 percent confidence interval of 1.73 to 30.01... All of our models are remarkably robust in showing this effect during the mid-childhood growth spurt, which, for boys, occurs at ages seven and eight years. For females, no clear association between fluoride in drinking water during growth and osteosarcoma is shown in this study... Our results are consistent with findings from (2001) the National Toxicology Program animal study which found 'equivocal evidence' for an association between fluoride and osteosarcoma for male, but not female, rats and from two ecological studies that found an association for males less than twenty years old (Hoover et al., 1991; Cohn 1992)." Doctoral Thesis, Harvard School of Dental Medicine (2001)


12) Y Li et al., Effect of Long-Term Exposure to Fluoride in Drinking Water on Risks of Bone Fractures, Journal of Bone and Mineral Research.


26) “Fluoride is a poison, comparable to arsenic and lead, as any toxicology textbook can confirm. It is a powerful inhibitor of many biological processes.” Dr. John Colquhoun, former Principal Dental Officer, Auckland Health District, New Zealand. Affidavit in Safe Water Association, Inc. vs City of Fond du Lac, State of Wisconsin Circuit Court Case No. 92 CV 579. (1993)

27) Anita Shattuck The Fluoride Debate, Health Way House February 2001 “the maximum contaminant level (MCL) for lead is 0.015 ppm, and the MCL for arsenic was recently lowered to 10 ppb (parts per billion), with a goal of 0.0 ppm for both of them.”

Ed note: This is highly significant information. The MCL for lead, which is considered a little less toxic than fluoride, is .015 ppm. And the MCLG (maximum contaminant level goal) is zero. The MCLG for fluoride is 4 ppm. Therefore, the standard for lead is more than 250 times more stringent than the standard for fluoride, even though fluoride is more toxic! Generally when the government sets these standards they put in a big margin of safety. They haven’t done this for fluoride. The NAS report strongly suggested that the MCLG for fluoride should be lowered to 2 ppm. That means if we fluoridate to 1 ppm, we would be adding enough fluoride to get halfway to the maximum level. This seems incredibly reckless, worse than useless, and ill advised.
REPORT BY FLUORIDE COMMISSION CHAIR CONCLUDING THAT THE EVIDENCE REGARDING THE EFFECTIVENESS AND SAFETY OF FLUORIDATION IS INCONCLUSIVE AND THEREFORE RECOMMENDING AGAINST CONTINUING FLUORIDATION.

June 24, 2006

It is undisputed that fluoride in large volumes is dangerous, even deadly when ingested by human beings.

It is generally accepted that fluoridation in volumes of 0.7 to 1.2 mg/L helps to protect against dental caries or tooth decay, although that conclusion is disputed by a minority of analysts.

The weight of the evidence seems to indicate that water fluoridation in the 0.7 to 1.2 mg/L is an effective method of protecting against dental caries, and it provides universal protection – especially including lower income children who may not get acceptable levels of professional dental care.

Use of fluoridated toothpaste, other commercial fluoride products, and topical fluoride treatments by a dentist, are alternative ways of providing fluoride protection against dental caries.

A very small number of individuals appear to have demonstrable adverse effects on their health from drinking fluoridated water.

A large majority of medical professionals in the United States support fluoridation, concluding that it is safe and effective in preventing dental caries.

The lengthy booklet “Fluoridation Facts” by the American Dental Association (2005) presents the ADA position in detail in question and answer format. “The Fluoridation Debate: A Response to the American Dental Association Booklet Fluoridation Facts,” compiled by Anita Shattuck in 2000, together with a supporting booklet of documentation, disputes the conclusions in an earlier version of the ADA booklet on the same question by question basis. These documents are listed on Exhibit D as items D-2, D-3 and D-4, and are available with the clerk.

Exhibit A, Appendix A, page 3, to the Commission’s interim report to the Mayor and Assembly of February 15, 2005, addressed the issue of cancer risks. That appendix should be updated to note that the American Cancer Society supports fluoridation and has concluded that it is safe.

Much of the literature opposing fluoridation is anecdotal, makes an unreasonable extrapolation of evidence regarding ingestion of large amounts of fluoride to draw conclusions about the effects of small amounts of fluoride, or is based on junk science.
All sides agree that further research is needed. That is a constant theme in the recent National Academy of Sciences (NAS) study, conducted by the National Research Council (NRC) of the National Academies, on the toxicology of fluoride. No definitive study on the effects of water fluoridation in volumes of 0.7 to 1.2 mg/L has been done.

The NRC report is the best compilation of the research done to date. The methods followed by the NRC meet professional scientific standards and its approach was unbiased. The NRC findings should be accorded great weight.

The NRC report concluded that the Environmental Protection Agency’s (EPA) maximum allowable level for fluoride of 4 mg/L is not adequately protective of health and should be reduced, and that the EPA’s standard of 2 mg/L does not adequately prevent the occurrence of moderate enamel fluorosis. Further, the NRC cautioned that its study did not evaluate the risks or benefits of the lower fluoride concentrations (0.7 to 1.2 mg/L) used in water fluoridation, and warned against concluding that the potential harmful effects found at higher fluoride levels are applicable at the lower levels used in municipal fluoridation. See the NRC Report in Brief, p.4, attached as Exhibit B.

The Centers for Disease Control and Prevention (CDC), following review of the NRC report, said that it “continues to strongly support community water fluoridation as a safe and effective public health measure to prevent and control tooth decay and to improve overall health.” See Exhibit C. See also Exhibits E-2, E-3 and E-5.

The labor union representing 1500 scientists, lawyers, engineers and other professional employees at EPA headquarters in Washington, D.C., has issued a paper opposing water fluoridation as a potential health hazard. See Exhibit G.

After considerable thought about the evidence, I have concluded that municipal water fluoridation probably provides significant, cost effective protection against dental caries, and is probably safe for all but a small number of individuals with specific medical issues. However, the possibility that fluoridation in the 0.7 to 1.2 mg/L range may have adverse health effects is not negligible, and the effectiveness of fluoridation in preventing dental caries is not certain.

The nearly unanimous belief that further research is needed highlights the uncertainty about the effects of fluoridation. There are reasonable disagreements among scientists and governmental policy makers about fluoridation.

For example, most of Europe has decided against fluoridation, and there is considerable evidence that this has not had an adverse effect on dental health (though there is also some contrary evidence). In the United States, fluoridation is widely, but not universally, used. Many American jurisdictions have decided not to fluoridate. See the five documents included as Exhibit C.

The Alaska Legislature, this past session, adopted House Concurrent Resolution No. 5 (SCS HCR 5 (HES)), urging that all communities in Alaska offer their citizens the
benefits of optimally fluoridated water. The resolution was supported by many state medical associations, dentists and communities, with a much smaller group in opposition. However, the scientific evidence presented to the Legislature was minimal and analysis of the evidence was non-existent. The resolution reflects a bandwagon effect based on conventional wisdom. See the documents listed as Exhibit D, Item 8, which include the Resolution and documents collected by the legislature, on file with the clerk.

There are also differences of opinion among the members of the Juneau Fluoride Commission. All of the members have worked hard in studying the issues, and have researched and discussed them constructively. However, the members have reached different conclusions after reviewing the same evidence.

I do not share the level of confidence of the three Commission members who recommend continued fluoridation, believing it to be safe and effective. The evidence is mixed and there is no definitive study on the issue.

I do not share the assessment of the evidence by the two Commission members who recommend discontinuing fluoridation. No study has been found showing that fluoridation is harmful in the 0.7 to 1.2 mg/L range. The findings and reports cited by the members opposing fluoridation in many cases are disputed and often involve levels of fluoride well in excess of 0.7 to 1.2 mg/L.

The complete NRC report (Exhibit D, Item 1, on file with the City Clerk) raises many questions without answering them. For example, at page 138 the NRC finds the evidence inadequate to fully assess the risk of bone fractures for people exposed at the 2 mg/L level, or in the 1 to 4 mg/L range. See also pages 145-46. Studies finding an adverse effect on IQ were found in areas in China with a mean water concentration of fluoride of 2.47 plus or minus 0.79 (range 0.57-4.50 mg/L), as compared with areas with a mean concentration of 0.36 plus or minus 0.15 mg/L (range 0.18-0.76 mg/L). More study is said to be needed. See page 173. At page 186 the NRC raises the possibility that fluorides act to increase the risk of developing Alzheimer’s disease, with more research needed. Adverse endocrine effects were found in ranges that could be reached with fluoride concentrations of 1-4 mg/L in drinking water, especially for children. NRC report, pp. 217-8, 224.

The NRC notes that in 1993 it concluded that the collective data do not present convincing evidence of an association between fluoride and increased occurrence of bone cancer in animals. But in 2006 it says, “the nature of the uncertainties in the existing data could also be viewed as supporting a greater precaution regarding the potential risk to humans.” Page 271; see also p. 275. Analyzing studies since 1993, the NRC says, “The combined literature described above does not clearly indicate that fluoride is or is not carcinogenic in humans.” Page 284. The “. . . literature as a whole is still mixed and equivocal.” Page 286.

These cherry picked examples do not fairly represent the NRC report as a whole, and none of these examples provides proof that fluoridation in the level used by
municipalities is unsafe. However, the NRC finds a need for further study in nearly every area of its analysis. I find the level of uncertainty in the NRC report to be troubling.

I believe that the evidence supporting the conclusions that water fluoridation helps protect against dental caries, and is safe, is stronger than the evidence that fluoridation is ineffective or unsafe. Absolute proof that fluoridation is safe and effective cannot be expected. However, the evidence in support of fluoridation is not as firm as the proponents claim, and the possibility that fluoridation may have adverse effects is not insignificant.

In summary, I find the evidence concerning the effectiveness and safety of municipal fluoridation to be inconclusive. In reviewing the available scientific studies as an engineer, I find that the evidence tends to support fluoridation, but that the studies done so far are inadequate and further examination is required before final conclusions can be drawn. In reviewing the evidence as a lawyer, I believe a preponderance of the evidence supports fluoridation, but the evidence does not meet a higher, clear and convincing standard. Since I do not find the evidence supporting fluoridation to be compelling, I think the City and Borough of Juneau should follow the maxim, “first, do no harm.” I recommend that Juneau discontinue water fluoridation until further studies of the kind advocated by the National Research Council address the issues of the safety and effectiveness against dental caries of water fluoridation in the 0.7 to 1.2 mg/L range.

William B. Rozell
Commission Chair
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