Comments of

COALITION FOR SAFE BUILDING MATERIALS

(California Pipe Trades Council, Consumer Federation of California, Planning and Conservation League, California Professional Firefighters, Center for Environmental Health, Sierra Club of California and Communities for a Better Environment)

on the

Draft Environmental Impact Report

on the

Adoption of Statewide Regulations Allowing the Use of PEX Tubing

VOLUME I

COMMENTS PREPARED BY:

Daniel L. Cardozo
Thomas A. Enslow
Adams Broadwell Joseph & Cardozo
520 Capitol Mall, Suite 350
Sacramento, CA 95814

Dr. Robert A. Clark
GT Engineering
18372 Redmond - Fall City Road
Redmond, WA 98052

Thomas S. Reid
TRA Environmental Sciences, Inc.
545 Middlefield Road, Suite 201
Menlo Park, CA 94025

Michael Krause
Veritox
18372 Redmond - Fall City Road
Redmond, WA 98052

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I. INTRODUCTION

On behalf of the Coalition for Safe Building Materials ("Coalition"), this letter provides comments on the May 2008 "Draft Environmental Impact Report on the Adoption of Statewide Regulations Allowing the Use of PEX Tubing" ("DEIR"). The DEIR evaluates the potential impacts of the proposed adoption of regulations that would amend the current California Plumbing Code ("CPC") to permit the use of cross-linked polyethylene ("PEX") tubing for potable water pipe ("Project") in residential, commercial and institutional buildings.

The Coalition members include the California Pipe Trades Council, the Sierra Club, the Planning and Conservation League, California Professional Firefighters, Communities for a Better Environment, the Consumer Federation of California, and the Center for Environmental Health. The environmental, consumer, public health and labor organizations that make up the Coalition represent literally millions of Californians concerned about the safety of new building materials.

The California Building Standards Commission ("CBSC") has prepared the DEIR as the lead agency under the California Environmental Quality Act ("CEQA"). The DEIR states that it may be relied upon for approval of PEX in occupancies under the jurisdictions of the Department of Housing and Community Development ("HCD"), Division of the State Architect ("DSA"), Office of Statewide Health Planning and Development ("OSHPD"), Department of Public Health ("DPH") and the Department of Food and Agriculture ("DFA").

The Coalition commends CBSC for preparing the DEIR. The DEIR corroborates many of the concerns that the Coalition has long raised regarding this product. These concerns include the leaching of methyl tertiary-butyl ether ("MTBE") and tert-butyl alcohol ("TBA") in amounts that exceed the state standards for taste, odor and health, the permeation of PEX pipe by outside contaminants and the potential premature degradation and rupture of PEX pipe. For the first time, this DEIR proposes measures to attempt to mitigate these hazards. This represents a welcome turnaround from HCD's now abandoned 2006 Negative Declaration on the statewide approval of PEX and PEX-AL-PEX, which mysteriously ignored the undisputed evidence of these health, safety and performance issues.

Unfortunately, the DEIR has only partially performed its duties under CEQA. Numerous potential impacts of this Project are simply ignored or are dismissed without foundation. In addition, mitigation measures relied upon to address admitted impacts are inadequate, improperly deferred or lack enforceability. The failure to meaningfully analyze or mitigate numerous potential impacts renders this document legally inadequate.

As discussed in more detail later in this document, the legal inadequacies of the DEIR include:

- Inadequate description of the Project, including failure to describe all variations of PEX approved by the Project and failure to describe PEX fittings approved by the Project;

- Inadequate mitigation of potential direct and cumulative contamination of drinking water due to the leaching of chemicals such as MTBE and TBA;

- Failure to evaluate or disclose potentially significant impacts of Ethyl tertiary butyl ether ("ETBE") leaching from PEX pipes;

- Improper deferral of analysis and mitigation of Proposition 65 chemicals that may leach from certain PEX formulations;

- Failure to evaluate the potential for PEX to leach Bisphenol A in amounts within the range of concern for infant and children exposure;

- Inadequate mitigation of the risk that drinking water may be contaminated due to the permeation of PEX piping by solvent-based pesticides and termiticides, benzene, gasoline constituents and other toxic substances;

- Inadequate evaluation and mitigation of the risk of PEX failure due to exposure to numerous commonly encountered materials and environmental conditions, including sunlight, high temperatures, chlorine, petroleum products, firestop material and asphalt;

- Failure to meaningfully evaluate reports of widespread failures of PEX and PEX fittings;

- Failure to evaluate the risk of illness due to higher biomass and more abundant virus-like particles found in PEX pipe compared to copper or CPVC pipe;

- Failure to adequately evaluate the direct and indirect solid waste impacts of the Project; and

- Failure to adequately evaluate the risk of toxic smoke when PEX is burned in building fires.

The DEIR must be revised to evaluate these deficiencies and recirculated for public review and comment.

We have prepared these comments with the assistance of technical experts. Their *curriculum vitae* are attached as Exhibits H, I & J.

Exhibits A, B & C contain the comments and analysis of the leaching and permeation issues prepared by chemist Thomas Reid of TRA Environmental Services, Inc. ("Reid Comment Letter"). Mr. Reid received his training in chemical engineering at Yale University and his training in biological sciences at Stanford. He has prepared environmental studies for over 30 years and he has studied the chemistry and the associated environmental impacts of plastic plumbing for over 25 years. He also has over 20 years of experience providing expert testimony to agencies on building materials and building standards issues. Mr. Reid's curriculum vita is attached as Exhibit H.

California courts have recognized Mr. Reid's expertise on plastic plumbing pipe materials for more than a decade.[1] Most recently, the Court of Appeal in the *Plastic Pipe and Fittings Association. v. California Building Standards Commission* case recognized Mr. Reid as a qualified expert on the potential dangers of PEX pipe, including the potential for chemical leaching, permeation, mechanical failure and fire hazards.[2] The court held that "there is no reasonable question that Mr. Reid is qualified to state his opinion on these subjects."[3] Mr. Reid's comments are incorporated by reference and are hereby made a part of the Coalition's comments.

Exhibits D, E & F contains the technical comments of Dr. Robert Clark on the propensity of PEX piping to prematurely degrade and rupture ("Clark Comment Letter"). Dr. Clark is a principal and founding member of GT Engineering. Dr. Clark holds a Bachelors of Science degree in metallurgy, a Masters of Science degree in materials science and engineering, and a Ph.D. in materials science and engineering with a metallurgy specialization and a minor in mechanical engineering, all from the University of California at Berkeley. His specialty is the investigation and determination of cause for degradation and failure in materials. This has included extensive work involving failures in engineered plastic or polymeric products such as molded parts, tubing, woven products and cordage. Dr. Clark has testified in cases across the United States as a court qualified expert in materials science, mechanical engineering, metallurgy, corrosion and accident reconstruction. Most recently, Dr. Clark has served as an expert consultant and investigator for numerous litigation cases involving PEX piping failures in Washington State. Dr. Clark's curriculum vita is attached as Exhibit I. Dr. Clark's comments are incorporated by reference and are hereby made a part of the Coalition's comments.

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[1] See *ABS Institute v. City of Lancaster* (1994) 24 Cal.App.4th 285.

[2] *Plastic Pipe and Fittings Assn. v. California Building Standards Com.* ("*PPFA v. CBSC*") (2004) 124 Cal.App.4th 1390.

[3] *Id.*

Exhibit G contains the technical comments of Michael Krause on the propensity of PEX piping to promote the growth of biofilm and biomass containing potentially dangerous pathogens ("Krause Comment Letter"). Mr. Krause is a Senior Industrial Hygienist with Veritox and has more than 25 years of experience providing industrial hygiene consulting and training. Mr. Krause has provided industrial hygiene, safety, asbestos management, and indoor air quality services to firms in the aerospace, metals and wood products industries; to schools and universities; building owners and managers; contractors; utilities; hospitals; labor unions; and government agencies.

Mr. Krause holds a Master of Science degree in Public Health / Industrial Hygiene and Safety from the University of Washington. He is a Certified Industrial Hygienist, a Canadian Registered Occupational Hygienist and a certified OSHA Institute trainer. Mr. Krause is a full member of the American Academy of Industrial Hygiene and the American Industrial Hygiene Association ("AIHA"). He currently serves on the national AIHA Noise Committee. He has served as President and Director of the 350-member AIHA Pacific Northwest Section. Michael is an affiliate member of the American Conference of Governmental Industrial Hygienists.

Mr. Krause's curriculum vita is attached as Exhibit J. Mr. Krause's comments are incorporated by reference and are hereby made a part of the Coalition's comments.

Please note that these experts' comments supplement the issues addressed below and must be addressed and responded to separately. These comments also reference a number of additional supporting technical documents, reports and other evidence that are attached hereto as appendices. These supporting appendices are also incorporated by reference and hereby made a part of the comments of the Coalition.

It is critical to the health and safety of the California public that the potential impacts of PEX be fully disclosed, evaluated and mitigated before these materials are approved for use throughout California. The DEIR must be revised to disclose and evaluate impacts that were improperly ignored or dismissed and to identify feasible and enforceable measures to reduce all Project impacts to a level of insignificance. Because such revisions would be substantive and substantial, the revised DEIR must then be recirculated for additional public review and comment.

II. THE DEIR FAILS TO COMPLY WITH THE FUNDAMENTAL INFORMATIONAL AND PUBLIC DISCLOSURE REQUIREMENTS OF CEQA

CEQA is designed to inform decision-makers and the public about the potential, significant environmental effects of a project.[4] "CEQA's fundamental goal [is] fostering informed decision-making."[5] "The purpose of CEQA is not to generate paper, but to compel government at all levels to make decisions with environmental consequences in mind."[6]

An EIR is "the heart of CEQA,"[7] and "serves as the informational tool to facilitate informed decision-making."[8] The EIR acts as an "environmental 'alarm bell' whose purpose is to alert the public and its responsible officials to environmental changes before they have reached the ecological points of no return."[9] The EIR aids an agency in identifying, analyzing, disclosing, and, to the extent possible, avoiding a project's significant environmental effects through implementing feasible mitigation measures.[10] The EIR also serves "to demonstrate to an apprehensive citizenry that the [agency] has analyzed and considered the ecological implications of its action."[11] Thus, an EIR "protects not only the environment but also informed self-government."[12]

To fulfill this function, the discussion of impacts in an EIR must be detailed, complete, and "reflect a good faith effort at full disclosure."[13] CEQA requires an EIR to disclose all potential direct and indirect, significant environmental impacts of a project.[14] A significant environmental impact is "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance."[15]

A legally adequate EIR "must contain sufficient detail to help ensure the integrity of the process of decision-making by precluding stubborn problems or

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[4] 14 Cal. Code Regs. ("CEQA Guidelines") § 15002, subd. (a)(1).
[5] *Laurel Heights Improvement Assn. v. Regents of University of California ["Laurel Heights I"]* (1988) 47 Cal.3d 376, 402.
[6] *Bozung v. LAFCO* (1975) 13 Cal.3d 263, 283.
[7] *County of Inyo v. Yorty* (1973) 32 Cal.App.3d 795, 810.
[8] *Dusek v. Anaheim Redevelopment Agency* (1985) 173 Cal.App.3d 1029, 1037.
[9] *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1220.
[10] Pub. Resources Code § 21002.1(a); CEQA Guidelines § 15002(a), (f).
[11] *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68, 86.
[12] *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564.
[13] CEQA Guidelines § 15151; *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal.App.4th 713, 721-722.
[14] Pub. Resources Code § 21100, subd. (b)(1); CEQA Guidelines § 15126.2, subd. (a).
[15] CEQA Guidelines § 15382.

serious criticism from being swept under the rug."[16] Mere conclusory pronouncements are not sufficient. An adequate EIR must contain facts and analysis that provide a road map to how an agency has reached its conclusions.[17]

CEQA also imposes an affirmative obligation on agencies to avoid or reduce environmental harm by adopting feasible project alternatives or mitigation measures.[18] If an EIR identifies potentially significant impacts, it must then propose and evaluate mitigation measures and alternatives sufficient to minimize these impacts.[19] This requirement is the heart of CEQA. Without an adequate analysis and description of feasible mitigation measures, it would be impossible for agencies relying upon an EIR to meet this obligation.

Mitigation measures must be designed to minimize, reduce or avoid an identified environmental impact or to rectify or compensate for that impact.[20] A public agency may not rely on mitigation measures of uncertain efficacy or feasibility.[21] "Feasible" means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors.[22]

Mitigation measures must be specific and fully enforceable through permit conditions, agreements or other legally binding instruments.[23] Mitigation measures that are vague or so undefined that it is impossible to evaluate their effectiveness are legally inadequate.[24]

While we commend CBSC for producing an EIR that acknowledges many of the hazards of PEX use and appears to make a good faith effort to mitigate these hazards, the combined deficiencies in the DEIR still result in a document that fails to meet the basic informational and public disclosure requirements of CEQA. As explained in detail in each of the sections that follow and in the attached technical exhibits, the DEIR fails to include an accurate or complete Project description,

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[16] *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 733.
[17] See *Citizens of Goleta Valley v. Board of Supervisors*, *supra*, 52 Cal.3d at 568.
[18] Pub. Resources Code §§ 21002-21002.1; CEQA Guidelines § 15002, subds. (a)(2)-(3); see also, *Berkeley Keep Jets Over the Bay Committee v. Board of Port Commissioners* (2001) 91 Cal.App.4th 1344, 1354; *Citizens of Goleta Valley v. Board of Supervisors, supra,* 52 Cal.3d at 564; *Laurel Heights I, supra,* 47 Cal.3d at 400.
[19] Pub. Resources Code §§ 21002.1, subd. (a), 21100, subd. (b)(3).
[20] CEQA Guidelines § 15370.
[21] *Kings County Farm Bureau v. City of Hanford, supra,* 221 Cal.App.3d at 727 (finding groundwater purchase agreement inadequate mitigation measure because no record evidence existed that replacement water was available).
[22] CEQA Guidelines § 15364.
[23] CEQA Guidelines § 15126.4, subd. (a)(2).
[24] *San Franciscans for Reasonable Growth v. City & County of San Francisco* (1984) 151 Cal.App.3d 61, 79.

wholly fails to address a number of Project impacts and inadequately addresses others, and relies on mitigation measures that, although seemingly well-intentioned, are inadequate and ill-conceived.

III. THE DEIR PROVIDES AN INADEQUATE AND MISLEADING PROJECT DESCRIPTION

The DEIR is legally deficient because it fails to accurately describe the Project. The DEIR fails to completely and accurately describe all the variations of PEX that would be approved by the Project. The DEIR fails to describe and disclose the PEX fittings that would also be approved by the Project. The DEIR also fails to fully disclose the scope of the Project's approval of PEX, which allows PEX not just in buildings and under slab, but also underground from the water meter to the building structure.

The failure to provide an accurate and consistent project description renders an EIR legally deficient.[25] CEQA Guidelines require that a project definition include "the whole of the action, which has a potential for resulting in a physical change in the environment, directly or ultimately . . .."[26]

The definition of the project under review in a DEIR is critically important since it informs the public and governmental decision-makers of the nature of the proposed activity and determines the scope and content of the analysis that follows. The courts have repeatedly held that "an accurate, stable and finite project description is the sine qua non of an informative and legally sufficient EIR."[27]

The policy behind the requirement for a clear, accurate and complete project definition was cogently stated in *County of Inyo v. City of Los Angeles*:

> A curtailed or distorted project description may stultify the objectives of the reporting process. Only through an accurate view of the project may affected outsiders and public decision-makers balance the proposal's benefit against its environmental cost, consider mitigation measures, assess the advantage of terminating the proposal (i.e., the 'no project' alternative) and weigh other alternatives in the balance.[28]

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[25] CEQA Guidelines §15124; *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 193.
[26] CEQA Guidelines § 15378.
[27] *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 193.
[28] *County of Inyo v. City of Los Angeles, supra*, 71 Cal.App.3d at p. 193; see *also City of Santee v. County of San Diego, supra*, 214 Cal.App.3d at pp. 1450-1455.

As another court noted, the failure to include all components of a project in the project description defeats CEQA's mandate for full public disclosure and consideration of potential impacts: "Because of this omission, some important ramifications of the proposed project remained hidden from view at the time the project was being discussed and approved. This frustrates one of the core goals of CEQA."[29]

In the case at hand, the failure to fully describe all aspects of the Project has resulted in an incomplete and inaccurate evaluation of the Project's impacts in the DEIR and frustrates the core goals of CEQA.

PEX is a generic term for plastic pipe that is made by cross-linking polyethylene.[30] The DEIR, however, fails to adequately describe the variations in PEX formulations and manufacturing methods permitted under the proposed regulations.

There are currently three commercial methods of cross-linking:

- PEX-a, the so-called Engel method, where the polyethylene resin and a chemical additive are heated to produce cross-linking;

- PEX-b, the silane method which produces silicon-oxygen cross-link bonds; and

- PEX-c, where cross-linking is initiated by gamma or electron beam radiation.

In addition to the variations in classes of PEX, manufacturers also use varying recipes of stabilizers, fillers and other additives for making PEX within each class. The differences in manufacturing methods, additives and recipes result in differing chemical compositions and create a potential for a wide variation in health and environmental effects.[31]

While the DEIR describes the three methods of cross-linking PEX, it fails to describe or evaluate the 271 variations in PEX formulations.[32] The lack of detail provided on the chemical additives contained in the various PEX products makes it impossible for either the public or public agency decision-makers to fully evaluate the potential impacts of this Project.

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[29] *Santiago County Water District v. County of Orange, supra,* 118 Cal.App.3d at p. 830.
[30] DEIR at p. 3-6.
[31] Exhibits A to G.
[32] See DEIR at p. 4.4-9.

Moreover, the DEIR fails to consider that new or revised formulations of PEX may be introduced into the market that would also be allowed pursuant to this Project. The DEIR must define the full range of options for PEX manufacturing and formulation that would be authorized by the Project in order to take into account future variations of PEX.

The Project description is also inadequate because the DEIR fails to fully describe the complete plumbing system proposed for authorization. The proposed Project would approve both PEX piping and PEX fittings.[33] PEX fittings vary in type and material and include the brass insert fittings that have recently suffered widespread failures throughout the United States resulting in numerous class action suits.[34] The DEIR's failure to address all components of the PEX plumbing system presents a misleading picture of the full scope of potential impacts. By failing to include PEX fittings in the Project description, the DEIR fails to disclose to the public the true scope of the Project and impermissibly evades environmental analysis of a significant component of the Project.

The Project description is further deficient because it fails to fully disclose the entire scope of the Project's approval of PEX. The DEIR discloses that the Project would allow PEX in buildings and under slab, but fails to disclose that it would also allow the installation of PEX underground from the water meter to the building structure. The Project proposes approval of PEX pipe and fittings for use in both building water distribution piping and building water supply piping.[35] The DEIR describes the use of PEX for building distribution piping, which includes hot and cold water distribution systems within a building or under slab. However, it fails to disclose that the Project would also approve the use of PEX for building supply piping, which is defined as "the pipe carrying water from the water meter or other source of water supply to a building."[36] This failure is significant because of the susceptibility of PEX to permeation from contaminated soil or water. A complete description of the scope of the proposed Project approval is critical in order to ensure that mitigation is suitably crafted to encompass all PEX that may be at risk from permeation.

Without a complete Project description, the environmental analysis in the DEIR is impermissibly narrow, thus understating the Project's impacts and undermining public review and disclosure and informed decision-making.[37] These

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[33] DEIR at p. 3-5; 24 Cal. Code Regs., Part 5, §§ 604.1, 604.11, 604.11.1 & Table 6-4.
[34] See Section VI.H, *infra*.
[35] DEIR at p. 3-4; see also 24 Cal. Code Regs., Part 5, § 204, 604.1 & Table 6-4.
[36] 24 Cal. Code Regs., Part 5, § 204 (definition of Building Supply); see also 24 Cal. Code Regs., Part 5, § 204, 604.1 & Table 6-4.
[37] See, e.g., *Laurel Heights Improvement Association v. Regents of the University of California* (1988) 47 Cal.3d 376.

errors must be corrected in a revised DEIR and an opportunity must be provided to the public to comment on the whole of the action.

IV. THE DEIR FAILS TO ADEQUATELY DISCLOSE AND MITIGATE LEACHING OF CHEMICALS FROM PEX PIPE INTO THE DRINKING WATER

A. The DEIR Corroborates that PEX Pipe May Leach Significant Amounts of MTBE and TBA Directly From PEX Pipe and Result in Contaminated Drinking Water

The DEIR finds that MTBE and TBA may leach out of PEX pipe and contaminate drinking water at levels that greatly exceed California standards for health, odor and taste. The DEIR concludes that this is a significant impact of the Project.[38] This finding substantiates findings of the Coalition's prior comments submitted on this issue. It also reverses HCD's puzzling claim in the abandoned 2006 PEX negative declaration that MTBE and TBA leaching from PEX was not a potentially significant impact.

Independent laboratory tests released by NSF International confirm that PEX may leach MTBE at levels that exceed both California's taste and odor threshold for MTBE of 5 parts per billion and California's health-based Maximum Contaminant Level ("MCL") for MTBE of 13 ppb.[39] Reports on leaching tests conducted in Norway have also found MTBE in concentrations as high as 47.6 ppb, almost four times the level allowed under California's health-based MCL.[40] These studies found that VOCs leaching from PEX pipes gave an "intense" unwanted odor to the test water.[41]

In addition to taste and odor impacts, the leaching of MTBE into PEX may have adverse effects on human health. A University of California study concluded

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[38] DEIR at p. 4.4-16.

[39] DEIR, Appendix F; Appendix 1, MTBE Fact Sheet, California Department of Boating and Watercraft (Dec. 8, 2003); Appendix 2, California Department of Health Services – MTBE: Drinking Water Regulations and Monitoring Results (Nov. 3, 2003); and Appendix 3, OEHHA - all PHGs developed as of April 23, 2004.

[40] Appendix 5, Skjevrak, et al, *Volatile Organic Components Migrating from Plastic Pipes* (HDPE, PEX and PVC) into Drinking Water, 37 Water Research (2003) at p. 1917.

[41] Appendix 4, Hem, *Potential Water Quality Deterioration of Drinking Water Caused by Leakage of Organic Compounds from Materials to Contact with the Water*, Proceedings, 20th NoDig conference, Copenhagen (May 28-31, 2002); Appendix 5, Skjevrak, et al, *Volatile Organic Components Migrating from Plastic Pipes* (HDPE, PEX and PVC) into Drinking Water, 37 Water Research (2003) at p. 1917.

that MTBE is an animal carcinogen with the potential to cause cancer in humans.[42] The U.S. Environmental Protection Agency ("EPA") has also stated the MTBE has the potential to cause cancer in humans.[43] OSHPD stated in its 2006 review of PEX pipe that the leaching of MTBE into potable water for the hospitals, care facilities and nursing homes under its jurisdiction was a concern because of its potential to cause cancer.[44] Studies on animals suggest that MTBE has the potential to cause developmental toxicity.[45] As a result of these health concerns, the California Department of Public Health[46] has set a health-based MCL on MTBE of 13 ppb.[47] The California Office of Environmental Health Hazard Assessment ("OEHHA") has also adopted a public health goal for MTBE of 13 ppb for drinking water.[48]

NSF data also reveal significant leaching of TBA from PEX pipe in amounts that exceed California health standards. The leaching tests released by NSF International revealed normalized concentrations of TBA ranging up to 6900 ppb.[49] The leaching of TBA may also have adverse affects on human health. Studies have found evidence of a carcinogenic response to TBA.[50] As a result, DPH has adopted an action level on TBA of 12 ppb.[51] The NSF data reveals PEX leaches TBA in amounts almost 600 times this level.[52]

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[42] Appendix 1, MTBE Fact Sheet, California Department of Boating and Watercraft (Dec. 8, 2003); Appendix 6, OEHHA Methyl Tertiary Butyl Ether (MTBE) (Feb. 2, 2001).
[43] Exhibit B; Appendix 1, MTBE Fact Sheet, California Department of Boating and Watercraft (Dec. 8, 2003); Appendix 10, Department of Health Services, Final Statement of Reasons, Primary Maximum Contaminant Level for MTBE (Feb. 2000).
[44] Appendix 7, OSHPD, ISOR, 2007 Code Cycle – Part 5 (9/1/06) at p. 3.
[45] Appendix 6, OEHHA Methyl Tertiary Butyl Ether (MTBE) (Feb. 2, 2001), Appendix 9, Material Safety Data Sheet - Tert-Butanol (revised March 18, 2003); Appendix 10, Department of Health Services, Final Statement of Reasons, Primary Maximum Contaminant Level for MTBE (Feb. 2000).
[46] Previously known as the California Department of Health Services.
[47] Appendix 2, California Department of Health Services – MTBE: Drinking Water Regulations and Monitoring Results (Nov. 3, 2003); Appendix 10, Department of Health Services, Final Statement of Reasons, Primary Maximum Contaminant Level for MTBE (Feb. 2000); see also Health & Saf. Code §§ 116365, 116610.
[48] Appendix 3, OEHHA - all PHGs developed as of April 23, 2004; Appendix 11, Denton, OEHHA, *Adoption of a Public Health Goal for Methyl Tertiary Butyl Ether in California drinking water* (March 9, 1999).
[49] Appendix 12, NSF International Report to WIRSBRO re PEX leaching test (July 3, 2000).
[50] Appendix 6, OEHHA Methyl Tertiary Butyl Ether (MTBE) (Feb. 2, 2001); Appendix 13, California Department of Health Services, DHS Drinking Water Action Levels (Jan. 2003).
[51] *Id.*; see also Health & Saf. Code § 116445.
[52] See DEIR, Appendix F.

The DEIR evaluates this evidence and concludes that leaching of MTBE and TBA from PEX at levels greater than California health standards and taste and odor standards is a significant impact and must be mitigated.[53]

In addition, the DEIR acknowledges that the leaching of MTBE and TBA from PEX pipe at any detectable level may have a cumulative impact on water quality when combined with detectable levels of MTBE or TBA that are found in certain potable water supplies in California. The DEIR concludes that this cumulative impact is significant and must also be mitigated.

B. The DEIR's Evaluation of the Leaching of Proposition 65 Chemicals Is Incomplete and Impermissibly Deferred

The DEIR also finds that PEX has the potential to leach Proposition 65 chemicals in concentrations higher than allowed under the Proposition 65 statute and its implementing regulations.[54] The DEIR concludes that this impact is potentially significant and must be mitigated.[55]

While we agree that the potential for PEX to leach Proposition 65 chemicals is a significant impact, the DEIR's disclosure and analysis of this impact fails to meet even the most basic requirements of CEQA.

An EIR prepared by the lead agency must include a detailed statement setting forth all significant effects of the proposed project.[56] Its purpose is "to provide the public and governmental decision-makers . . . with *detailed information* of the project's likely effect on the environment; to describe ways of minimizing significant effects; to point out alternatives to the project."[57]

Failure to disclose the details of a significant impact in an EIR deprives "the public, who relied on the EIR's representations, of meaningful participation . . .."[58] An EIR must disclose to the public and to decision-makers the details and scope of an impact, so that the public may have an opportunity to review and comment on the severity of the impact and the adequacy of mitigation measures. "In reviewing an EIR a paramount consideration is the right of the public to be informed in such a way that it can intelligently weigh the environmental consequences of any contemplated action and have an appropriate voice in the formulation of any decision."[59]

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[53] DEIR at p. 4.4-16.
[54] *Id.*
[55] *Id.*
[56] Pub. Resources Code § 21100, subd. (b)(1).
[57] *County of Inyo v. City of Los Angeles*, *supra,* 71 Cal.App.3d at p. 192; emphasis added.
[58] *Mira Monte Homeowners v. County of Ventura* (1985) 165 Cal.App.3d 357, 365.
[59] *Karlson v. City of Camarillo* (1980) 100 Cal.App.3d 789, 804.

Additionally, the agency is required to make findings "with respect to each significant effect" that are based on substantial evidence in the record.[60] CEQA "contemplates serious and not superficial or pro forma consideration of the potential environmental consequences of a project."[61] "To facilitate CEQA's informational role, the EIR must contain facts and analysis, not just the agency's bare conclusions or opinions."[62]

The process of analyzing a project's impacts must be an interactive one between the public and the lead agencies. The process "must be open to the public, premised upon a full and meaningful disclosure of the scope, purposes, and effect of a consistently described project, with flexibility to respond to unforeseen insights that emerge from the process."[63]

In the case at hand, however, the DEIR's evaluation of the leaching of Proposition 65 chemicals fails to even identify what Proposition 65 chemicals leach from PEX. Instead, the DEIR vaguely refers to these chemicals as "certain Proposition 65 chemicals used in some PEX formulations." The DEIR identifies three Proposition 65 chemicals by name (butyl benzyl phthalate, toluene diamine, and carbon black), but makes clear that many other undisclosed Proposition 65 chemicals may also be leached by PEX.

Moreover, the DEIR fails to provide any information on the levels that any of the disclosed or undisclosed Proposition 65 chemicals have been found to leach or are permitted to leach under current NSF standards.

Rather than disclose even the most basic information regarding this potential impact, the DEIR instead states that this data has been "requested" but was "not available at the time of DEIR publication." Under CEQA, however, a DEIR is not to be published until it is complete. Arbitrary deadlines for completing a DEIR may not be used to evade and defer disclosure and analysis of a Project's impacts until after the EIR's certification.[64]

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[60] Pub. Resources Code §§ 21081, subd. (a), 21081.5.

[61] *Leonoff v. Monterey County Bd. of Supervisors* (1990) 222 Cal.App.3d 1337, 1347-48.

[62] *Id.*

[63] *County of Inyo v. City of Los Angeles* (1984) 160 Cal.App.3d 1178, 1185.

[64] Emails obtained pursuant to the Public Records Act suggest that the premature release of the DEIR prior to obtaining all of the Project information and prior to completing evaluation of all of the Project's impacts may have been due to the unusual intervention of the Governor through the State and Consumer Services Agency to pressure the CBSC and other agencies to move forward with PEX approval. An email from the State and Consumer Services Agency to the Executive Director of the CBSC warned: "I know I keep emphasizing the overarching significance of our efforts and cooperation to reach the Governor's goal heree [sic], and I apologize if you're tired of hearing this; but...the Governor really wants to see the PEX project proceed promptly, successfully and with his administration acting in unison." (Appendix 14, Leslie Lopez email to

The complete failure to provide even the most basic information regarding which Proposition 65 chemicals leach from PEX pipe, and in what amounts, deprives the public of any opportunity to meaningfully participate in the CEQA process. The failure to disclose any of the details or scope of this impact renders the DEIR legally inadequate.

C. The DEIR Fails to Adequately Mitigate Leaching of MTBE, TBA and Proposition 65 Chemicals From PEX Pipe

As discussed above, the DEIR concludes that the leaching of MTBE, TBA and "certain proposition 65 chemicals" from PEX pipe is a significant impact. To address these leaching impacts, the DEIR proposes three mitigation measures that it asserts will reduce these impacts to a level of insignificance.

The DEIR proposes:

> **Mitigation Measure 4.4-1: Noncompliance with Drinking Water Standards Resulting from Leaching.**
> "The Building Standards Commission shall require that PEX installed in California for water for human consumption be physically marked in a manner that indicates that the pipe is certified for California human consumption water uses and meets all California drinking water criteria under the California Safe Drinking Water Act and Proposition 65."
>
> "Adoption of Mitigation Measure 4.4.1 would reduce potential impacts relative to leaching of MTBE, TBA, or Proposition 65 chemicals to less than significant levels."
>
> **Mitigation Measure 4.4-2: Adverse Taste and Odor Impacts.**
> "Before using PEX for human consumption water uses, PEX must receive NSF certification that any leached concentrations of MTBE is below the secondary California MCL for this chemical. PEX manufacturers claim that MBTE and TBA levels leached from PEX decline over time. They may pursue testing by NSF to determine whether the levels decline to below California criteria within a limited time."

Dave Walls (5/8/08) (elliptical in original.) Another email from the State Consumers Service Agency to the Department of Public Health's Office of Legal Services stated: "I'd like to make another pitch to expedite DPH's approval for its portion of the proposed Building Standards for the PEX project. The project is one of the Administration's priorities." (Appendix 14, Leslie Lopez email to Kathleen Keeshan (5/8/08).)

"Adoption of Mitigation Measure 4.4.2 would reduce taste and odor impacts on drinking water from leaching MTBE to less than significant."

Mitigation Measure 5-1: Cumulative Noncompliance with Drinking Water Standards Resulting from Leaching.
"For water service areas that have detectable levels of MTBE or TBA in drinking water or where there is known MTBE or TBA contamination of a source of drinking water, PEX tubing installed for human consumption uses must be certified not to leach detectable levels of MTBE or TBA."

These proposed mitigation measures are an important and commendable step in the right direction. However, these measures are seriously flawed as currently proposed and fail to meet the requirements of CEQA.

1. The Reliance of Mitigation Measure 4.4-1 on Undisclosed and Unevaluated NSF Testing Protocols and Standards Results in an Improper Deferral of Mitigation

Mitigation Measure 4.4-1 requires PEX potable water pipe installed in California to "be physically marked in a manner that indicates that the pipe is certified for California human consumption water uses and meets all California drinking water criteria under the California Safe Drinking Water Act and Proposition 65." To meet this requirement, Mitigation Measure 4.4-1 requires the private standards-setting organization NSF to specially certify that PEX installed in California does not leach MTBE, TBA, or Proposition 65 chemicals above the relevant California MCL, notification, or Safe Harbor level or other applicable Proposition 65 level for those chemicals.

The DEIR then concludes: "Adoption of Mitigation Measure 4.4.1 would reduce potential impacts relative to leaching of MTBE, TBA, or Proposition 65 chemicals to less than significant levels."

This conclusion lacks foundation because Mitigation Measure 4.4-1 defers critical components of this mitigation to the judgment of NSF. NSF is a private testing organization that is not accountable to the public and that is almost entirely funded by manufacturers of plumbing products listed and tested by NSF. NSF does not make its test results available to the public or government regulators and limits its testing protocols based on undisclosed assumptions derived from information provided by manufacturers.

As explained in the attached comments of Mr. Reid, NSF uses test protocols, techniques and assumptions that may allow for certification of PEX that in actual

use would significantly exceed the stated maximum contaminant levels.[65] NSF uses a "normalization calculation" to estimate "at-the-tap" exposures that significantly underestimates exposures for residential plumbing installations. NSF also expressly retains the discretion to certify products to NSF 61 even where the exposure concentration is in excess of NSF's own established maximum acceptable level for the contaminant. As a result, current NSF testing protocols may underestimate leaching levels and allow for certification of products that exceed the certified maximum allowable levels.

Due to these concerns, CBSC may not rely on NSF certification without independently reviewing the proposed evaluation process. Such reliance on a private entity's judgment without any independent review violates CEQA's requirement that a lead agency exercise its own independent judgment.

If the same test protocols, techniques and assumptions applied to NSF 61 were applied to the California certification required by Mitigation Measure 4.4-1, Mr. Reid's comments suggest that such certification would not ensure that such standards were always strictly met. Accordingly, the DEIR lacks foundation for its finding that this mitigation measure will reduce leaching impacts to a level of insignificance.

Moreover, the DEIR's reliance upon undisclosed testing protocols and assumptions to be designed by NSF deprives the public of the opportunity to review and comment on the suitability and sufficiency of the proposed mitigation. The DEIR must be revised to evaluate the NSF testing protocol upon which it intends to rely or to set forth more specific performance standards for meeting this certification requirement.

Mitigation Measure 4.4-1 is further deficient because it fails to set any performance standards for Proposition 65 chemicals that do not have safe harbor levels. Under Proposition 65, the OEHHA of the California EPA has developed numerical guidance levels known as "safe harbor numbers" for some, but not all, Proposition 65 chemicals. A business has "safe harbor" from Proposition 65 warning requirements or discharge prohibitions if exposure to a chemical occurs at or below these levels. These safe harbor numbers consist of no significant risk levels for chemicals listed as causing cancer and maximum allowable dose levels for chemicals listed as causing birth defects or other reproductive harm.

Mitigation Measure 4.4-1 requires that PEX installed in California must be certified to meet the safe harbor levels for Proposition 65 chemicals.

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[65] Exhibits A, B & C.

The DEIR, however, states that PEX may leach three Proposition 65 compounds for which no Proposition 65 safe harbor levels have been adopted: (1) butyl benzyl phthalate, (2) toluene diamine, and (3) carbon black. Because no safe harbor levels have been adopted for these contaminants, Mitigation Measure 4.4-1 must, itself, set a safe harbor performance standard for NSF testing. Such a standard must be based upon substantial evidence and the lead agency's independent evaluation of the underlying toxicity and testing data. Without such a standard, no foundation exists for concluding that Mitigation Measure 4.4-1 would reduce the impacts from leaching of butyl benzyl phthalate, toluene diamine, and carbon black to a level of insignificance.

Rather than setting such a standard, the DEIR improperly relies upon NSF to set this standard. Such reliance is baffling given that the DEIR concludes that NSF's current standards fail to meet California health and safety standards for numerous hazardous compounds.

The DEIR states that NSF has adopted a total allowable concentration for butyl benzyl phthalate of 1 mg/L. However, the DEIR fails to evaluate whether this NSF standard would meet Proposition 65 requirements. Accordingly, the reference to this standard has no relevance to the impact being discussed. Moreover, NSF has not set any total allowable concentration limits for toluene diamine or carbon black. The DEIR states that NSF will need to conduct additional testing for these compounds.[66] This suggests that NSF does not currently even test for leaching of these compounds from PEX.

Without an independent review of the actual certification standards for these Proposition 65 compounds, CBSC simply has no basis under CEQA to conclude that the NSF process will meet Proposition 65 requirements.

Even apart from CEQA, a determination of the level of public drinking water contamination that would be allowed by the regulatory approval of a plumbing product coming in contact with that water constitutes an exercise of police power that cannot be delegated to a non-governmental entity.[67] The DEIR's reliance on NSF's current and future standards for these compounds would be constitutionally permissible only if the DEIR independently evaluated the adequacy of such standards to meet Proposition 65 requirements.[68]

NSF standards are established in a non-public, confidential process, by a non-governmental body without conducting any independent assessment of the basis for those standards, or their adequacy in protecting public health. Moreover,

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[66] DEIR at p. 4.4-13.
[67] 63 Ops.Cal.Atty.Gen. 566 (1980).
[68] *Id.* at pp. 580-582.

NSF disclaims any responsibility or liability to the public or public regulatory agencies relying on such standards. CEQA's requirement for the exercise of independent judgment by the lead agency, and the constitutional bar against the delegation of police powers to non-governmental bodies, are both intended to prevent just this kind of avoidance of public accountability.

Mitigation Measure 4.4-1's blind reliance on NSF standards violates CEQA's requirement for the exercise of independent judgment by the lead agency, and violates the constitutional bar against the delegation of police powers to non-governmental bodies. In order for Mitigation Measure 4.4-1 to reduce this impact to a level of insignificance, the DEIR must first be revised to investigate and determine what level of leaching of butyl benzyl phthalate, toluene diamine and carbon black would trigger Proposition 65.

2. Mitigation Measure 4.4-2 for Taste and Odor Is Improperly Vague and Fails to Reduce Impacts to a Level of Insignificance

For reasons that are not disclosed, the DEIR provides a separate, slightly different mitigation measure to address leaching of MTBE at levels above the secondary California MCL for taste and odor. Like Mitigation Measure 4.4-1, Mitigation Measure 4.4-2 requires that PEX potable water pipe installed in California must receive a special NSF certification that any leached concentrations of MTBE are below the secondary California MCL for taste and odor. However, this mitigation measure adds a caveat that PEX manufacturers "may pursue testing by NSF to determine whether the levels decline to below California criteria within a limited time."

This caveat suggests that NSF may certify PEX pipe as complying with California standards even if such pipe actually violates California standards for several weeks, months or even years. This caveat renders Mitigation Measure 4.4-2 legally inadequate and contradicts the DEIR's finding that this measure would reduce taste and odor impacts on drinking water from leaching MTBE to less than significant.

The proposed mitigation measure for taste and odor does not reduce this impact to level of insignificance because it still allows violation of California standards for an unspecified period of time. Even minute amounts of MTBE are known to give water an offensive taste similar to paint thinner and an offensive

odor similar to turpentine.[69] As a result, the California Department of Public Health has set a taste and odor threshold for MTBE of 5 parts per billion.[70]

The DEIR states unequivocally that the exceedance of this threshold resulting in the contamination of drinking water with offensive taste and odor is a significant impact.[71] In addition, the DEIR adopts as a threshold of significance for this Project: the exceedance of a federal or state secondary MCL for taste and odor.[72]

The proposed mitigation measure on its face allows for significant taste and odor impacts. As currently fashioned, Mitigation Measure 4.4-2 would allow the installation of PEX pipe that exceeds California's taste and odor threshold for MTBE for some unknown period of time. Pursuant to the DEIR's own threshold of significance, this would result in a significant taste and odor impact during this unspecified period.

Accordingly, no foundation exists for the conclusion that Mitigation Measure 4.4-2 would reduce this impact below a level of significance.

Mitigation Measure 4.4-2 is further legally inadequate because it improperly defers definition of "within a limited time" and improperly delegates determination of this definition entirely to a private non-governmental body. This blind reliance on NSF standards violates CEQA's requirement for the exercise of independent judgment by the lead agency, and violates the constitutional bar against the delegation of police powers to non-governmental bodies.[73]

Such impacts are thus not mitigated to a level of insignificance. Under CEQA, the public must be informed that the proposed Project, even with the mitigation, will likely result in short term taste and odor impacts. Because the Project would approve the installation of PEX in hospitals, schools, care facilities, nursing homes and other occupancies with vulnerable populations, the impact of such leaching on persons with compromised-immune systems must also be evaluated.[74]

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[69] Appendix 1, MTBE Fact Sheet, California Department of Boating and Watercraft (Dec. 8, 2003).
[70] Appendix 2, California Department of Health Services – MTBE: Drinking Water Regulations and Monitoring Results (Nov. 3, 2003).
[71] DEIR at p. 4.4-16.
[72] DEIR at p. 4.4-8.
[73] See 63 Ops.Cal.Atty.Gen. 566 (1980).
[74] Appendix 7, OSHPD, Initial Statement of Reasons ("ISOR"), 2006 Code Cycle, Part 5 (Sept. 1, 2006) at p. 3; Appendix 8, OSHPD, ISOR, 2004 Code Cycle, Part 5 (May 2004).

CEQA requires an EIR to disclose all significant effects of the proposed project.[75] The DEIR's failure to disclose that proposed Mitigation Measure 4.4-2 would result in taste and odor impacts for an unknown duration of time deprives the public of any opportunity to meaningfully participate in the CEQA process. The failure to disclose this impact and the improper deferral and delegation of the determination of how long such impacts will persist render the DEIR legally deficient.

The DEIR must be revised to amend Mitigation Measure 4.4-2 to ensure that all PEX pipe installed in California shall meet California taste and odor standards for MTBE from the time of installation. NSF's own data demonstrates that such mitigation is feasible and that entire classes of PEX are readily available that would meet this standard.[76]

3. Mitigation for Cumulative MTBE and TBA Impacts Lacks Enforceability and Feasibility

The DEIR proposes an additional, separate and distinct mitigation to address its finding that any detectable leaching of MTBE or TBA from PEX pipe may result in significant cumulative impacts where a building's water supply also has detectable levels of MTBE or TBA. Mitigation Measure 5-1 would require that any PEX installed in a water service area that has detectable levels of MTBE or TBA in the drinking water must be certified not to leach detectable levels of MTBE or TBA.[77]

While a step in the right direction, Mitigation Measure 5-1 is vague as to certain critical details and suffers from a number of significant enforcement and implementation problems.

First, Mitigation Measure 5-1 must be revised to clarify that it intends to require that this special-certification be *NSF-certified* as is required by Mitigation Measures 4.4-1 and 4.4-2. In its current form, Mitigation Measure 5-1 does not expressly require NSF-certification that PEX pipe does not leach any detectable levels of MTBE or TBA. If the intention of Mitigation Measure 5-1 is not to require NSF or some other third party certification, the DEIR must explain why and evaluate how compliance will be ensured without such certification. As discussed

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[75] Pub. Resources Code § 21100, subd. (b)(1); *County of Inyo v. City of Los Angeles*, *supra,* 71 Cal.App.3d at p. 192.

[76] See, e.g., DEIR at p. 4.4-14 (stating that generally PEX-B and PEX-C are not expected to release MTBE); see also DEIR, Appendix F (NSF letter dated May 2, 2008 showing 5 out of 8 PEX samples well below California MTBE taste and odor standards).

[77] DEIR at p. 5-6.

above, even with NSF certification, such certification must be evaluated to ensure appropriate testing protocols and assumptions are applied.

Second, Mitigation Measure 5-1 must be revised to verify that the special-certification of PEX required under this measure must be physically marked on the PEX piping and fittings. Again Mitigation Measures 4.4-1 and 4.4-2 include such a requirement, but Mitigation Measure 5-1 fails to specify such markings. Without such markings, compliance with this measure would be impossible to enforce and difficult to follow. Even with such markings, enforcement of dual California-specific certifications will be difficult and burdensome.

To ensure that users install the appropriate PEX pipe, PEX pipe that meets Mitigation Measures 4.4-1 and 4.4-2 but has detectable levels of MTBE or TBA should be marked: "not certified for use with water supplies that have detectable levels of MTBE or TBA." Without such a mark, contractors would have no idea that PEX pipe certified to meet all California standards may still not be approved for use in the area where the installation is proposed.

Third, Mitigation Measure 5-1 must be revised to ensure a reasonable likelihood of compliance and effectiveness. CEQA requires that public agencies adopt "feasible" mitigation measures that must "actually be implemented as a condition of development, and not merely adopted and then neglected or disregarded."[78] Mitigation measures must be feasible, meaning capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social and technological factors.[79] "When the success of mitigation is uncertain, an agency cannot reasonably determine that significant effects will not occur."[80]

In the case at hand, Mitigation Measure 5-1 fails to address how this requirement would actually be implemented. Accordingly its success is uncertain and its likelihood of reducing this impact to a level of insignificance cannot reasonably be determined.

The proposed special-certification requirement for PEX pipe installed in buildings with MTBE or TBA contaminated drinking water creates obvious enforcement and compliance issues. Mitigation Measure 5-1 fails to address how contractors and building officials are to know if the water supply has detectable

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[78] *Federation of Hillside and Canyon Associations v. City of Los Angeles* (2000) 83 Cal.App.4th 1252, 1261; see Public Resources Code § 21002.1, subd. (b).

[79] Pub. Resources Code, § 2106.1; CEQA Guidelines § 15364.

[80] Remy, Thomas & Moose, Guide to CEQA (1999), p.426; see *Sundstrom v. County of Mendocino, supra,* 202 Cal.App.3d at 306-308.

levels of MTBE or TBA and fails to address how contractors and building officials are to ensure that the correct type of PEX pipe is installed.

Current building code requirements do not include any provisions for informing a contractor or building official whether or not a building's water supply has detectable levels of MTBE or TBA. Without a requirement that building officials be provided such information, this mitigation measure is meaningless.

Accordingly, this measure should be amended to require that all contractors must install PEX specially-certified to have no detectable levels of MTBE or TBA unless they provide evidence that the building's water supply has no detectable levels of MTBE or TBA.

Such a requirement should follow the format that has been used for CPVC pipe in Section 604.1.1 of the California Plumbing Code. This code section requires the contractor or plumbing subcontractor to supply a written certificate of compliance with CPVC mitigation measures prior to the issuance of a building permit, requires the building permit to contain permit conditions requiring compliance with mitigation measures, and requires the building official to make findings of compliance prior to issuing final permit approval. This code section also requires building officials to cite contractors or subcontractors for any violations of this section.

Following this format, Mitigation Measure 5-1 should be revised to include the following requirements:

> (a) Approved Materials: All PEX and PEX fittings installed for potable water building supply and building distribution systems shall be certified by NSF either: (1) to comply with all California drinking water standards (including public health goals, notification standards, and taste and odor standards) and all Proposition 65 standards; or (2) to not leach any detectable levels of MTBE or TBA *and* to comply with all California drinking water standards (including public health goals, notification standards, and taste and odor standards) and all Proposition 65 standards. Such certifications must be physically marked on the PEX pipe and fittings. In addition, PEX Pipe and fittings that leach any detectable levels of MTBE or TBA must also be physically marked: "not certified for use with water supplies that have detectable levels of MTBE or TBA." The Installation of PEX with any detectable levels of MTBE or TBA is prohibited unless the applicable public water agency certifies that a buildings water supply has no detectable levels of MTBE or TBA or unless a water quality test demonstrates that the building's water supply has no detectable levels of MTBE or TBA.

(b) Certification of Compliance: Prior to issuing a building permit that permits the installation of PEX piping and fittings, the Authority Having Jurisdiction or Enforcing Agency shall require as part of the permitting process that the contractor, or the appropriate plumbing subcontractors, provide one of the following: (1) a certified statement from the applicable public water system agency that the building's water supply has no detectable levels of MTBE or TBA; (2) a certified water quality report by a qualified third party testing laboratory demonstrating that the building's water supply has been tested and no detectable levels of MTBE or TBA have been found; or (3) signed written certification that they will only install PEX piping and fittings certified to have no detectable levels of MTBE or TBA leaching.

(c) Permit Conditions: Any Building Permit issued permitting the installation of PEX piping and fittings shall specify what type of PEX is permitted to be installed and shall indicate what evidence, if any, was provided to demonstrate that the building's water supply has no detectable levels of MTBE or TBA.

(d) Findings of Compliance. The Authority Having Jurisdiction or Enforcing Agency shall not give final permit approval to installations of PEX piping or fittings without expressly determining that all PEX piping and fittings installed met the permit conditions.

(e) Penalties. If during the conduct of any building inspection the Authority Having Jurisdiction or Enforcing Agency finds that these requirements or any permit conditions regarding the installation of PEX piping and fittings have been violated, the contractor or subcontractor shall be cited for that violation.

These conditions would, of course, have to be further revised to address any additional measures imposed to mitigate other impacts discussed elsewhere in this letter, including other leaching impacts, permeation impacts, firestop incompatibility impacts, and premature failure impacts.

As demonstrated by these comments, Mitigation Measure 5-1 suffers from significant enforcement and compliance issues and requires substantial revision.

D. The DEIR Fails to Evaluate or to Disclose Potentially Significant Impacts from the Leaching of ETBE from PEX Pipes

The DEIR is legally inadequate because it fails to evaluate or disclose potentially significant impacts from the leaching of ETBE from PEX pipes despite substantial evidence of this impact in the lead agency's own expert reports.

ETBE is a chemical compound similar to MTBE. Unlike MTBE, however, this substance has not been evaluated by the state and no maximum contaminant levels have been set regarding contamination of drinking water with this compound.

The DEIR states that ETBE has been found to leach from PEX in concentrations from 23 to 200 ug/L. The DEIR further admits "People were able to smell ETBE at a concentration of 5 ug/L."[81]

The potential adverse impact of ETBE contamination was evaluated in the April 7, 2008 Water Quality Memorandum prepared by Ishrat S. Chaudhuri, Ph.D., Senior Toxicologist with ENSR.[82] Dr. Chaudhuri is the water quality expert hired by the lead agency to evaluate potential leaching impacts in the DEIR.

In his memorandum, Dr. Chaudhuri found that PEX-b may leach concentrations of ETBE at a level that "could contribute to the taste and odor of drinking water, and potentially have adverse health implications."[83] He further found that water samples exposed to PEX-b demonstrated the presence of a distinct "chemical/solvent like" odor that "persisted even after multiple flushing periods."[84] Dr. Chaudhuri's findings are undisputed. No contrary evidence exists in the DEIR or any of its supporting documents.

Despite the lead agency's own expert's conclusion that leaching of ETBE from PEX represents a potentially significant health impact and may result in taste and odor impacts, the DEIR fails to evaluate this impact whatsoever.

Rather than disclosing, evaluating and mitigating this impact, the DEIR improperly dismisses this impact on the grounds that no state or federal drinking water standards exist for ETBE. The DEIR claims, "It would require speculation to reach a conclusion regarding the significance of any potential leaching of chemicals lacking drinking water standards into drinking water."[85]

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[81] DEIR at p. 4.4-14.
[82] DEIR, Appendix E.
[83] DEIR, Appendix E at pp. 2 & 7.
[84] DEIR, Appendix E at p. 7.
[85] DEIR at p. 4.4-14.

This claim lacks foundation and ignores the lead agency's own expert's opinion. Potential impacts must be evaluated in an EIR whenever substantial evidence in the record supports a "fair argument" that the Project may result in such impacts.[86] As a matter of law, "substantial evidence includes … expert opinion."[87]

The DEIR's claim that it would require speculation to rely upon any substantial evidence other than state or federal drinking water standards lacks any evidentiary foundation and is contrary to law. Moreover, the DEIR's claim would mean that even where there was overwhelming scientific consensus that a chemical was dangerous, an EIR would not be obligated to evaluate the leaching of this chemical if the state or federal government had not yet formally regulated it. Such a position violates CEQA's requirement to disclose all potential direct and indirect significant environmental impacts of a project.[88]

A very similar argument was rejected by the courts in the 2001 case, *Berkeley Keep Jets Over the Bay Committee v. Board of Commissioners*.[89] In *Berkeley Keep Jets*, the EIR argued that:

> There is no approved, standardized protocol for assessing the risk associated with mobile source emissions of TACs, as there is for stationary-source emissions . . .. Furthermore, there is no standard for evaluating the significance of the risk associated with mobile-source emissions of TACs. Therefore, while the potential risk associated with mobile-source TAC emissions can be qualitatively discussed and can be considered by decision makers, a formal determination of the significance of the impact would be speculative and would not be based on accepted scientific principles or methodologies. The significance of this impact is thus considered unknown.[90]

Unsurprisingly, the Appellate Court rejected this argument as follows:

> The fact that a single methodology does not currently exist that would provide the Port with a precise, or "universally accepted," quantification of the human health risk from TAC exposure does not excuse the preparation of any health risk assessment-it requires the

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[86] Pub. Resources Code §§ 21100, 21064.
[87] Pub. Resources Code § 21080(e)(1); CEQA Guidelines § 15064(f)(5).
[88] See Pub. Resources Code § 21100, subd. (b)(1); CEQA Guidelines § 15126.2, subd. (a).
[89] *Berkeley Keep Jets Over the Bay Committee v. Board of Commissioners* (2001) 91 Cal.App.4th 1344.
[90] *Id*. at 1367-1368.

> Port to do the necessary work to educate itself about the different methodologies that are available. The Guidelines recognize that "[d]rafting an EIR . . . involves some degree of forecasting. While foreseeing the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonably can." (Guidelines, § 15144, italics added.)[91]

The DEIR further attempts to dismiss its own expert's finding by narrowly defining the scope of the DEIR's environmental analysis. The DEIR states: "This DEIR evaluates and draws conclusions regarding the significance of the potential leaching of any chemical that is regulated by the federal government or the State of California."[92] CEQA, however, requires an EIR to disclose and evaluate *all* significant effects of the proposed project.[93] CEQA does not provide an exception for impacts caused by chemicals that are not regulated by the federal government or the State of California.

Finally the DEIR attempts to avoid finding ETBE leaching to be a significant impact by relying on an arbitrary threshold of significance. The DEIR states that its thresholds for determining if a leaching impact is significant are if such leaching would:

- Violate any water quality standards such that implementation of the proposed project would result in a level of a contaminant in drinking water that exceeds a federal or state MCL, notification or response level, or a Proposition 65 safe harbor or other relevant Proposition 65 level; or

- Violate any water quality standards such that implementation of the proposed project would result in a level of a contaminant in drinking water that exceeds a federal or state secondary MCL for taste and odor.

A lead agency may formulate standards of significance for use in an EIR as long as a reasonable basis exists for using those standards. This requires that the agency make a policy judgment about where the line should be drawn for distinguishing adverse impacts deemed substantial from those that are not deemed substantial.[94] This judgment must, however, be based on scientific information and other substantial evidence.[95]

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[91] *Id.* at 1370.
[92] DEIR at p. 4.4-14.
[93] Pub. Resources Code § 21100, subd. (b)(1); *County of Inyo v. City of Los Angeles*, *supra,* 71 Cal.App.3d at p. 192.
[94] CEQA Guidelines § 15064, subd. (b).; *Mira Mar Mobile Community v. City of Oceanside* (2004) 119 Cal.App.4th 477.
[95] Kostka & Zischke, *Practice Under the California Environmental Quality Act*, § 13.2, p. 621.

Moreover, thresholds of significance only create a presumption of significance or insignificance. They do not relieve a lead agency of its duty to evaluate substantial evidence that may rebut this presumption.[96]

Nor do they apply where, as here, the threshold is inapplicable to the substantial evidence presented. "If evidence is submitted tending to show that the environmental impact might be significant despite the significance standard used in the EIR, the agency must address that evidence."[97]

Here, the DEIR's threshold of significance for leaching violates CEQA because this threshold arbitrarily ignores the substantial, unrebutted evidence in the state's own expert report that leaching of ETBE from PEX pipe may result in significant taste, odor and health impacts. CEQA does not permit a lead agency to ignore evidence of project impacts by formulating artificially narrow thresholds of significance.

The DEIR must be revised and recirculated to disclose and evaluate this impact, to permit public review and comment and to identify feasible mitigation to address this impact. If the Department of Public Health has not set a threshold of significance for ETBE, the Lead Agency is fully authorized to develop its own threshold based upon a review of available substantial evidence.[98] Each responsible agency must be consulted in setting such a threshold to ensure that the special vulnerabilities of their occupants are taken into account. OSHPD occupancies, for example, would include immune-compromised occupants of hospitals, health care facilities and nursing homes.[99]

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[96] See *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1111.

[97] Kostka & Zischke, *Practice Under the California Environmental Quality Act*, § 13.2, p. 624; *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1111.

[98] CEQA Guidelines §15064.7 ("Each agency is encouraged to develop and publish thresholds of significance that the agency uses in the determination of the significance of environmental effects"); Pub. Res. Code § 21082 (directing agencies to adopt procedures and criteria for evaluating projects)

[99] See Appendix 7, OSHPD, ISOR, 2006 Code Cycle, Part 5 (Sept. 1, 2006) at p. 3; Appendix 8, OSHPD, ISOR, 2004 Code Cycle, Part 5 (May 2004).

E. The DEIR Fails to Evaluate the Potential for PEX to Leach Bisphenol A in Amounts within the Range of Concern for Infant and Children Exposure

The DEIR is further deficient because it fails to evaluate the potential for PEX to leach Bisphenol A in amounts within the range of concern for infant and children exposure. In his April 7, 2008 Water Quality Memorandum, Dr. Chaudhuri finds that PEX may leach Bisphenol A.[100] Rather than evaluating this potential impact, Dr. Chaudhuri assumes that the NSF criterion for Bisphenol A would be considered protective in California since California does not have a drinking water criterion for this compound.[101] Dr. Chaudhuri, however, provides no factual or analytical basis for this assumption.

Dr. Chaudhuri states that NSF sets a Bisphenol A standard for PEX of 0.1 ppm.[102] However, he fails to independently review the NSF standard to determine if it is sufficient to reduce any health impacts to a level of insignificance.

The DEIR may not rely on NSF/ANSI standards without independently reviewing the underlying data and independently assessing the evaluation process. Such reliance on a private entity's judgment without any independent review violates CEQA's requirement that a lead agency exercise its own independent judgment.

Here, the DEIR never *independently* evaluates the level of Bisphenol A contamination accepted by NSF to determine its safety and never reviews the actual levels of leachate found in NSF testing. CBSC's reliance on a private entity for the fundamental health risk determination without any independent review of that determination violates CEQA's requirement that the DEIR reflect the lead agency's independent judgment and violates the constitutional bar against the delegation of police powers to non-governmental bodies.[103]

The DEIR's blind reliance on the NSF standard for Bisphenol A is particularly troublesome given its contradictory finding that numerous NSF leaching standards fail to meet California health and safety standards.[104]

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[100] DEIR, Appendix E at p. 5.
[101] *Id.*
[102] *Id.*; see also DEIR at p. 4.4-16.
[103] See *PPFA v. CBSC, supra,* 124 Cal.App.4th at 1399-1400 (appellate court upheld requirement of the California Building Standards Commission to independently review the potential environmental impacts from the approval of PEX plastic potable water pipe despite the fact that PEX met NSF standards).
[104] See DEIR at p. 4.4-13.

Mr. Reid concludes that NSF standards for unregulated contaminants may be unreliable because they are established largely on the basis of toxicity information and studies provided by and owned by the manufacturers of the regulated products.[105] NSF must be evaluated with the understanding that the industrial participants that have an economic stake in the results of the process dominate its standards setting and testing processes. Essentially, the fox is guarding the henhouse.

These deficiencies demonstrate that NSF standards alone may not provide sufficient assurances regarding PEX's chemical leaching potential. Without an independent review of the basis for these standards, the DEIR has no foundation for concluding that the NSF Bisphenol A standard will protect drinking water consumers. An assessment of the toxicological data underlying the action levels established by the NSF must be conducted along with assessment of other available information on Bisphenol A, before this compound can be disregarded as of concern.[106]

In his attached comments, Mr. Reid calculates that the NSF criterion for Bisphenol A of 0.1 mg/L would roughly equate to intake of 200 ug/day for an adult, at 50 kg body weight, that is a dose of 4 ug/kg/day; double for a child.[107] Based on his review of the relevant literature, Mr. Reid concludes that this level is well within the range of concern for infant and children exposure.[108]

Mr. Reid's comments are substantial evidence that the leaching of Bisphenol A may be a significant impact even if it meets NSF standards. Such evidence must be evaluated in a revised DEIR.

F. The DEIR Fails to Evaluate the Potentially Significant Impacts from Leaching of Other California Regulated Chemicals that May Occur in Future Formulations of PEX

The DEIR is further deficient because it fails to evaluate and mitigate foreseeable future leaching impacts from other California regulated compounds in addition to MTBE, TBA and Proposition 65 compounds.

The DEIR finds that numerous other NSF standards, in addition to MTBE and TBA fail to meet California drinking water standards.[109] The DEIR states that these include NSF standards for chemicals including benzene, cadmium, carbon

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[105] Exhibits B & C.
[106] See, e.g., Appendix 15, 63 Fed.Reg. 40 (March 2, 1998), p. 10282.
[107] Exhibit A.
[108] *Id.*
[109] DEIR at p. 4.4-13.

disulfide, 1,1-dichloroethane, ethyl benzene, di(2-ethylhexyl) phthalate, benzo(a)pyrene, and toluene.[110] The DEIR, however, fails to provide the entire list of compounds for which NSF standards fail to meet California standards.

The DEIR claims that only MTBE and TBA were found to exceed California standards in some proportion of the tests.[111] Nonetheless, this disclosure means that it is foreseeable that future variations of PEX could leach these other compounds in quantities that meet NSF standards but don't meet California standards. As proposed, the Project would approve any current or future versions of PEX that meet NSF standards. Because NSF standards would allow these compounds to leach at levels that violate California health or taste and odor standards, it is reasonably foreseeable that some future versions of PEX may violate these California standards. This is a significant impact that needs to be disclosed and mitigated.

The potential impact from future variations of PEX must be identified and evaluated to ensure that any proposed mitigation encompasses such potential leaching problems. Mitigation Measure 4.4-1 is currently insufficient to mitigate this potential impact. Mitigation Measure 4.4-1 states that "PEX must receive NSF certification that any leached concentrations of MTBE, TBA or Proposition 65 chemicals is below the relevant [California] MCL, notification, or Safe Harbor level or other applicable Proposition 65 level for those chemicals." This measure must be clarified to ensure that the required NSF certification will require that all compounds potentially leached from PEX meet relevant California MCL, secondary MCL, notification, or Safe Harbor level or other applicable Proposition 65 levels for those compounds.

The DEIR must also be revised to fully identify all compounds that could leach from PEX for which NSF standards don't meet or exceed California standards. Without such disclosure, the DEIR violates CEQA's requirement to disclose all potential impacts of a project.

V. THE DEIR FAILS TO PROVIDE ADEQUATE MEASURES TO MITIGATE PERMEATION OF PEX FROM OUTSIDE CONTAMINANTS

The DEIR is further deficient because it relies upon inadequate measures to mitigate permeation impacts.

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[110] DEIR at p. 4.4-13.

[111] The DEIR's claim that none of these other compounds leach from the 271 current versions of PEX in amounts that exceed California standards is not supported by any of the DEIR's supporting evidence. Accordingly, this claim appears to lack foundation.

The DEIR corroborates our long-standing concern that permeation of PEX by outside contaminants may be a significant impact. PEX is subject to permeation by benzene, solvents, gasoline constituents, solvent-based pesticides and termiticides, oils and other contaminants.[112] As currently proposed, the approval of PEX would allow the installation of PEX for external use from the water meter to the building structure and for use under the slab.[113] As a result, permeation is a particular concern where PEX is installed in soil or groundwater that contains or could potentially contain such contaminants.

As explained in Mr. Reid's attached comments, pollutants that contain low molecular weight substances, such as benzenes and MTBE, can readily migrate through the seemingly solid polymer barrier of PEX, contaminating the water inside the pipes.[114] Mr. Reid calculates that a PEX tube exposed to a 0.2% benzene concentration in a termiticide or in gasoline, would produce benzene in drinking water at around 10 ppb after standing overnight and upwards of 100 ppb after standing for a week.[115] Such contamination easily exceeds the California MCL for benzene of 1 ppb.

To mitigate this impact, the DEIR proposes Mitigation Measure 4.4-3. Mitigation Measure 4.4-3 states that PEX shall only be permitted under slab if:

> a Phase 1 Environmental Site Assessment is conducted following the ASTM E1527-05 standard . . . which concludes that contamination of the soils or groundwater in areas where PEX tubing would be placed or could be reasonably permeated by nearby contamination with solvents or gasoline is unlikely; or, [t]he PEX is sleeved by a metal or other material that is impermeable to solvents and petroleum products.

While Mitigation Measure 4.4-3 is a good start and certainly will reduce permeation impacts, it is insufficient to reduce the risk of permeation impacts to a level of insignificance. If a Phase I Environmental Assessment is conducted, this measure would permit the installation of unprotected PEX under slab or underground between the water meter and the building. Such PEX would still be at risk for contamination from future spills or leaks or from unrecorded past spills or unknown leaking underground storage tanks that would not be identified by a Phase 1 Environmental Site Assessment.

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[112] Exhibits A, B & C; Appendix 16, Lee, *Investigation of Plastic Pipe Permeation by Organic Chemicals*, American Water Works Service Company (Nov. 5, 1985); Appendix 17, Plastic Pipe Institute, *Thermoplastics Piping for the Transport of Chemicals* (Jan. 2000).
[113] DEIR at p. 3-4; 24 Cal. Code Regs., Part 5, §§ 204, 604.1 & Table 6-4.
[114] Exhibits A & B.
[115] *Id.*

A 2002 report on permeation published by the United States Environmental Protection Agency ("U.S. EPA") found that permeation incidents were equally split between high-risk locations such as industrial areas, former sites of fuel stations and near underground storage tanks, and low risk locations such as residential areas.[116] The sources of contamination for the low-risk areas included disposal and accidental leaking of gasoline, oil, and paint thinner products.[117] This report further stated that the risk of permeation impacts was greatest in smaller diameter service line pipes with lower flow or stagnant conditions such as those permitted under the Project between the water meter and the building.[118] The report also concluded that there was a greater likelihood of accidental releases of organic contaminants such as petroleum products near occupancies and closer to the point of withdrawal or consumption.[119]

A 1991 study published in the Journal of the American Water Works Association found that soil contamination occurred mainly after pipe installation, suggesting that soil analysis prior to pipe installation will not significantly decrease the number of incidents.[120] The occurrence of about half of all reported incidents in areas without known contamination risks indicated that limiting plastic pipe use to these areas will not be effective in preventing permeation.[121]

These studies present substantial, unrebutted evidence that Mitigation Measure 4.4-3 will not reduce permeation impacts below a level of significance.

Mitigation Measure 4.4-3 must be revised to prohibit any installation of PEX below slab or between the water meter and the building structure. Such a prohibition is feasible and has been recommended by even strong supporters of the proposed approval of PEX. In a letter submitted during the Notice of Preparation ("NOP") comment period for this DEIR, the California Professional Association of Specialty Contractors ("CALPASC") wrote that they strongly supported the proposed approval of PEX, but stated, "the *consensus of the industry* is that PEX tubing should not be installed under slab."[122] CALPASC did state that it would potentially consider a limited exception to this prohibition for PEX tubing under island sinks.[123] However, in such circumstances CALSPAC stated that the PEX tubing must be encased in a protective sleeve "to protect the PEX tubing from

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[116] Appendix 18, Office of Ground Water and Drinking Water, U.S. EPA, *Permeation and Leaching* (August 15, 2002) at p. 3.
[117] *Id.*
[118] *Id.*
[119] *Id.*
[120] Holsen, et al., *The Effect of Soils on the Permeation of Plastic Pipes by Organic Chemicals*, Journal of the American Water Works Association (1991).
[121] *Id.*
[122] Appendix 20, CALPASC Letter to Valerie Namba (November 27, 2007) at p. 1.
[123] *Id.*

contact with pesticides or petroleum byproducts."[124] In no circumstances did CALPASC recommend installation of unprotected PEX under slab. This letter was signed by CALPASC's Director of Risk Management. Numerous other contractors also submitted letters supporting these CALPASC comments.

Moreover, other states such as Arkansas have adopted exactly this prohibition. The Arkansas regulations for PEX expressly prohibit any installation of PEX below the slab.[125]

The DEIR's evaluation of permeation impacts is further inadequate because it incorrectly assumes that pesticides will not permeate PEX pipe and thus fails to evaluate and mitigate this potential impact. The DEIR concludes that "[t]heoretical calculations on permeation of termiticides indicated that these types of organic compounds are less likely to permeate PEX piping and do not represent a concern."[126] However, the 2005 Hoffman report upon which the DEIR bases this conclusion does not appear to evaluate termiticides and pesticides that contain solvents.

It is well settled that solvent-based termiticides and pesticides may permeate PEX and contaminate drinking water. In 2007, the Plastic Pipe Institute released a report on PEX and termiticides that concluded "permeation is probable" in an installation in which organic-based solvent pesticide is in constant contact with PEX.[127] The report warns users not to spray on or allow termiticides or pesticides to come in contact with PEX pipes, "otherwise permeation of harmful chemicals may occur through the pipe wall and contaminate drinking water."[128] A 2002 New Zealand report provides several case studies where termiticide applications permeated through PEX and contaminated drinking water.[129]

In addition, PEX manufacturers have themselves admitted that termiticide can permeate PEX and contaminate drinking water. In response to litigation in Arizona, the PEX manufacturer, Wirsbo, stated that the contamination of the plaintiff's drinking water with benzene was due to the termiticide in the soil surrounding the buried pipe.[130] Wirsbo claimed that is was not at fault for such

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[124] *Id.* at p. 4.
[125] See Appendix 21, Halsey Email (March 21, 2008); see also Appendix 22, Arkansas PEX Regulations.
[126] DEIR at p. 4.4-18.
[127] Appendix 23, Plastic Pipe Institute, *Recommended Practices Regarding Application of Pesticides and Termiticides near PEX Pipes*, TN-39 (August 2007) at p. 3.
[128] *Id.* at p. 6.
[129] Appendix 24, Marshal, et al., Queensland Health, *Report on the Workshop Termiticide Applications and Potable Water Supplies* (February 6, 2002).
[130] Appendix 25, UPONOR WIRSBO'S Initial Rule 26.1 Disclosure Statement, *Defren v. Trimark Homes*, Case No. CV2001-005145, Superior Court of Arizona, Maricopa County, (July 30, 2002).

permeation because it warns against exposing pipe to potentially permeating compounds.[131]

The DEIR must be revised to disclose the potential for solvent-based termiticides and pesticides to permeate PEX pipe. Moreover, feasible measures must be identified to mitigate this potential impact. Such measures should include a requirement to post a warning in any occupancy plumbed with PEX that solvent-based termiticides may not be applied.

VI. THE DEIR INADEQUATELY EVALUATES AND MITIGATES THE RISK OF PEX FAILURE

The DEIR is deficient because it fails to adequately disclose, evaluate or mitigate the risk of premature PEX pipe failure.

As currently proposed, the Project would approve PEX potable water pipe that meets any of the following three PEX chlorine resistance standards: (1) ASTM F2023; (2) NSF P171CL-T; or (3) NSF P171 CL-R. These standards vary substantially in the amount of protection they require from degradation due to exposure to chlorine and hot water:

(1) NSF P171 CL-1 assumes exposure to 25% hot water and 75% room temperature water and requires PEX to meet an 80-year service life test (40 years with a 0.5 design factor).[132]

(2) NSF P171 CL-R for recirculated hot water systems assumes exposure to 100% hot water and requires PEX to meet an 80-year service life test (40 years with a 0.5 design factor).[133]

(3) ASTM F2023 assumes exposure to 25% hot water and 75% room temperature water and requires PEX to meet a 50-year service life test (25 years if a 0.5 design factor is applied).[134]

While PEX manufacturers often rate their products for use with water at temperatures of 160 degrees Fahrenheit or more, each of these tests assumes a maximum hot water temperature of 140 degrees Fahrenheit.[135] None of these tests assess resistance to degradation from exposure to ultraviolet rays or commonly

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[131] *Id.*
[132] DEIR at p. 4.2-4.
[133] *Id.*
[134] *Id.*
[135] DEIR, Appendix C, Chaudhuri, ENSR, Memorandum re Comparison of Chlorine Resistance standards for PEX piping (April 7, 2008) at p. 2.

encountered building materials such as intumescent firestop material or asphalt. Nor do they assess resistance to degradation due to exposure to solvents, petroleum products or other contaminants.

The DEIR corroborates that PEX may prematurely rupture from interactions with oxidizers (i.e., UV light and chlorine) and firestop materials (materials used to safeguard PEX from fires).[136] PEX is susceptible to chemical attack from oxidizers such as chlorine or oxygen, both from water and from the surrounding air. The attack is accelerated by heat. Ultra violet rays in sunlight also damage and degrade PEX. Petroleum products, asphalt, certain firestop materials and numerous other commonly encountered chemicals and materials may also accelerate degradation. These attacks eventually cause polymer chain breakage, resulting in loss of strength, brittleness, and ultimately premature mechanical failure.[137] The DEIR concludes that such ruptures could cause serious water damage to homes, including growth of dangerous molds.[138]

The DEIR, however, fails to fully evaluate this risk and ignores substantial evidence in the record. The DEIR also concludes without foundation that the ASTM F2023 and NSF P171CL-T chlorine resistance standards, along with compliance with PEX manufacturer installation guidelines, are sufficient to reduce the risks of such impacts to a level of insignificance, except for where PEX is installed in recirculating hot water systems in jurisdictions that use chlorine for disinfection. For PEX installed in recirculating hot water systems in jurisdictions that use chlorine for disinfection, the DEIR recommends imposition of Mitigation Measure 4.2-1, which requires such PEX to be certified to the NSF P171 CL-R standard for recirculating systems or a yet-to-be adopted equally rigorous standard.

As demonstrated by the attached expert comments and supporting evidence, the DEIR lacks foundation for its conclusion that PEX certified to meet ASTM F2023 and NSF P171CL-T non-recirculating-system chlorine-resistance standards are not at risk for premature failure if installed in recirculating hot water systems in jurisdictions that use alternatives to chlorine for disinfection.[139]

In addition, the DEIR lacks foundation for its finding that PEX installed in traditional, non-recirculating hot and cold water systems is not at risk for premature failure. The record contains undisputed evidence that ASTM F2023 and

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[136] DEIR at p. 4.2-9.
[137] See Exhibits B, D & E; Appendix 26, Flowguard Gold, *Not All Plastic Plumbing Systems Perform the Same*, Plumbing Contractor News Technical Bulletin; Appendix 27, Temprite PEX – News Release, *Plumbing Pipe Made with Temprite® PEX Offers Resistance Due to Chlorine Degradation* (April 2003).
[138] DEIR at p. 4.2-10.
[139] See Exhibit D.

NSF P171CL-T are insufficient to reduce such risks to a level of insignificance.[140] ASTM F2023 fails, on its face, to require a reasonable lifetime of PEX. Moreover, both standards fail to mitigate for direct and cumulative degradation from sunlight, firestop material and other commonly encountered environments and materials.[141]

The DEIR also lacks foundation for its finding that Mitigation Measure 4.2-1 will reduce the risk of failure for recirculating hot water systems in jurisdictions that use chlorine for disinfection to a level of insignificance. The NSF P171 CL-R required by this measure also fails to mitigate for direct and cumulative degradation from sunlight, firestop material and other commonly encountered environments and materials.[142]

A. The DEIR's Mitigation for Recirculating Systems Is Inadequate Due to Its Unsubstantiated Exception for Water Systems that Disinfect with Chloramines

The DEIR admits that "...a potential exists for chlorinated potable water in continuously recirculating systems to cause PEX tubing to prematurely fail if it has not been tested for use in such a system."[143] In a memorandum on the chlorine resistance standards for PEX piping commissioned by the lead agency, Dr. Chaudhuri concludes that, for example, "ASTM 2023 was not meant to test for 100% continuously recirculating hot water, so simply meeting this standard would not be sufficient for systems with 100% hot water."[144] The DEIR further finds that neither ASTM F2023 nor NSF P171CL-T test for 100% continuously recirculating hot water. Both these standards instead test assuming 25% hot water and 75% room temperature water.

Based upon this evidence, the DEIR concludes that PEX certified to meet ASTM F2023 or NSF P171CL-T and exposed to continuously recirculated chlorinated hot water may prematurely degrade resulting in significant impacts.

Mitigation Measure 4.2-1 addresses this impact by requiring that PEX installed for recirculating systems in jurisdictions that use chlorine for disinfection "must be certified using the NSF P171 CL-R standard or a yet-to-be adopted equally rigorous standard that assumes 100% continuously recirculating chlorinated hot water, would ensure a conservative product lifetime of 40 years and is approved by

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[140] Exhibit D; Appendix 31, Boyher Lubrizol Advanced Materials, Inc., letter to DGS (November 28, 2007); Appendix 30, Emerman, *Heating System Can Cause Heavy Damage*, kirotv.com (February 3, 2003).
[141] Exhibits D.
[142] Exhibit D.
[143] DEIR at p. 4.1-10.
[144] DEIR, Appendix C, Chaudhuri, ENSR, Memorandum re Comparison of Chlorine Resistance standards for PEX piping (April 7, 2008) at p. 2.

the Building Standards Commission for testing PEX for continuously recirculating hot chlorinated water."[145]

This mitigation is legally inadequate, however, because it improperly limits its scope to jurisdictions that use chlorine to disinfect water. The DEIR states that an increasing number of jurisdictions in California are switching to chloramines to disinfect their water supply. The DEIR then assumes without foundation that chloramines will not degrade PEX and that Mitigation Measure 4.2-1 should be limited to jurisdictions that use chlorine for disinfection. The DEIR states that "[t]he possibility of PEX failure from chlorine degradation would be limited to jurisdictions that have not yet switched to chloramine disinfection and projects in those jurisdictions that use continuously recirculating, hot, chlorinated water systems."[146]

The assumption that chloramines will not degrade PEX is not based on any evidence and is wholly incorrect. No evidence is cited in the DEIR to support this conclusion. Moreover, a Public Record Act request for all documents relied upon to support the conclusions in the DEIR revealed absolutely no reports, studies, articles, expert opinions, or any other materials that evaluate or otherwise address the effect of chloramines on PEX pipe.[147]

CEQA requires conclusions in an EIR to be supported by substantial evidence.[148] Conclusory statements "unsupported by empirical or experimental data, scientific authorities, or explanatory information of any kind" are insufficient to support a finding of insignificance.[149] Furthermore, an EIR must provide the reader with the analytic bridge between its ultimate findings and the facts in the record.[150]

Here, the DEIR fails to describe the "analytic route" it traveled in determining that the chloramines would not degrade PEX pipe.[151]

In addition, this assumption is factually incorrect. A recent study by Jana Laboratories, Inc. prepared for the Plastic Pipe Institute found that significant depletion of PEX stabilizer was observed when chloramines were used as a

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[145] DEIR at pp. 1-6, 1-7.
[146] DEIR at p. 4.2-12.; see also DEIR at p. 1-7.
[147] Exhibit 32, Declaration of Thomas A. Enslow (June 20, 2008).
[148] Pub. Resources Code § 21081.5; CEQA Guidelines § 15091, subd. (b).
[149] *People v. County of Kern* (1974) 39 Cal.App.3d 830, 841-842.
[150] *Topanga Association for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506; see CEQA Guidelines, § 15091.
[151] *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 733.

disinfectant.[152] Chloramines are oxidants and thus, like chlorine, consume PEX stabilizers and eventually cause polymer chain breakage resulting in failure of the pipe.[153] Chloramines have been known to attack and degrade some plastics much more quickly than chlorine.[154] Moreover, chloramines have a much longer lifetime in water than chlorine and thus may remain at higher levels when it enters building water systems and may continue to attack plastic pipes for longer periods of time even when stagnant.[155]

The DEIR also fails to evaluate the use of other alternatives to chlorine as a disinfectant in California water systems. One such alternative is chlorine dioxide. Chlorine dioxide has been found to deplete PEX stabilizer at a much quicker rate than chlorine.[156]

Neither ASTM F2023, NSF P171 CL-T nor NSF P171 CL-R test PEX for chloramines or chlorine dioxide resistance in traditional hot and cold water systems or recirculating hot water systems. The Jana Laboratories, Inc. study looked at this issue and concluded that additional research is necessary to confirm the applicability of the standard ASTM and NSF test methodologies in assessing resistance to chloramines and chlorine dioxide.[157]

Moreover, a study conducted by Mr. Clark concluded that some PEX pipe certified for chlorine resistance in traditional hot and cold water systems would not last the 25-year warranty period in hydronic heating systems *even where the water was not chlorinated*.[158]

Because ASTM F2023 and NSF P171 CL-T do not assess PEX performance in *any* hot water recirculating systems (whether chlorinated or not), the DEIR's reliance upon these two standards to ensure performance in recirculating system installations with water disinfected by chloramines lacks any foundation and is arbitrary and capricious.

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[152] Appendix 33, Chung, et al., Jana Laboratories Inc., *An Examination of the Relative Impact of Common Potable Water Disinfectants (Chlorine, Chloramines and Chlorine Dioxide) on Plastic Piping System Components*, at p. 4.

[153] *Id.*; see also Appendix 34, Kevin Gaw, Schaefer Engineering, Forensic Features Newsletter, (2005) ("Chloramines can swell and crack plastics that are not resistant. The degradation of the plastic will continue until failure.")

[154] Appendix 34, Kevin Gaw, Schaefer Engineering, Forensic Features Newsletter, (2005).

[155] *Id*.

[156] Appendix 33, Chung, et al., Jana Laboratories Inc., *An Examination of the Relative Impact of Common Potable Water Disinfectants (Chlorine, Chloramines and Chlorine Dioxide) on Plastic Piping System Components*, at p. 4.

[157] *Id.*

[158] Exhibit D at p. 2.

Even if, *assuming arguendo*, ASTM F2023 and NSF P171CL-T were sufficiently protective standards for recirculating hot water systems that were treated with disinfectants other than chlorine, Mitigation Measure 4.2-1 would still be deficient due to its lack of feasibility. CEQA requires that public agencies adopt "feasible" mitigation measures that must "actually be implemented as a condition of development, and not merely adopted and then neglected or disregarded."[159] "When the success of mitigation is uncertain, an agency cannot reasonably determine that significant effects will not occur."[160]

Mitigation Measure 4.2-1 suffers from the same enforcement and compliance difficulties as Mitigation Measure 5-1, discussed *supra*. Mitigation Measure 4.2-1 fails to address how building officials and contractors are supposed to know what type of disinfectant is found in the water supply. Current building code requirements do not include any provisions for informing a contractor or building official whether a building's water supply uses chlorine or chloramines as a disinfectant. Without a requirement to provide building officials with reliable information regarding a building's water supply, this mitigation measure is meaningless.

Moreover, Mitigation Measure 4.2-1 fails to take into account the very real potential for jurisdictions that use chloramines to switch back to chlorine. As discussed in the DEIR and its supporting documents, the widespread use of chloramines as a disinfectant has had a number of unforeseen consequences, including reports of increased copper pipe failures, incompatibility with dialysis equipment and toxicity to fish. As a result, jurisdictions that had switched to chloramines have been known to switch back to chlorine.[161]

Because Mitigation Measure 4.2-1 is inadequate and lacks feasibility, it must be amended to require that all PEX pipe installed in recirculating systems, regardless of a jurisdiction's water supply, must meet NSF P171 CL-R. As discussed in more detail below, however, recirculated hot water systems plumbed with PEX would still be subject to premature failure due to other causes, even with such an amendment.

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[159] *Federation of Hillside and Canyon Associations v. City of Los Angeles, supra,* 83 Cal.App.4th at 1261; see Pub. Resources Code § 21002.1, subd. (b).

[160] Remy, Thomas & Moose, Guide to CEQA, *supra*, p.426; see *Sundstrom v. Mendocino County* (1988) 202 Cal.App.3d 296, 306-308.

[161] Exhibit 35, Port LaBelle Utility System; Hhttp://hendryutilities.com/docs/boxes/Annoucement_070726.htmH [as of May 17, 2008].

B. The DEIR Fails to Evaluate and Mitigate the Undisputed Evidence that ASTM F2023 Fails to Ensure an Adequate Lifetime for PEX Pipe

The DEIR is further deficient because it fails to address the inadequate lifetime assured by ASTM F2023 due to its failure to incorporate the industry-accepted standard of a 0.5 design factor. The record contains undisputed evidence that ASTM F2023 fails, on its face, to require a reasonable lifetime of PEX when installed in both traditional and recirculating hot and cold water systems.

Currently copper potable water systems are generally assumed to last beyond the lifetime of a building.[162] In establishing Mitigation Measure 4.2-1, however, the DEIR states that ensuring a conservative product lifetime of 40 years would reduce the risk of premature or unexpected PEX failure to less than significant.[163] Even assuming that a conservative 40-year lifetime is a reasonable lifetime for a plumbing system installed in a building, ASTM F2023 fails to provide for such a lifetime.

Both NSF P171 CL-1 and NSF P171 CL-R certify a conservative lifetime of 40 years which is calculated by requiring PEX to meet an 80-year service life test and then adding in a 0.5 design factor to account for unexpectedly harsh service conditions.[164]

ASTM F2023, on the other hand only requires PEX to meet a 50-year service life test, which is calculated without adding in the industry standard 0.5 design factor.[165] If this conservative design factor were applied, then the certified product lifetime for PEX tubing that is tested under the ASTM standard would be 25 years.[166]

ASTM F2023 is the only test for any piping material that doesn't utilize the industry-accepted standard of a 0.5 design factor.[167] "All tests conducted by ASTM on all other piping materials when a design factor is appropriate use a 0.5 design factor."[168] Not surprisingly, the weaker ASTM performance test for PEX was reportedly adopted by the consensus of the PEX manufacturers themselves.[169]

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[162] DEIR at p. 4.2-13.
[163] DEIR at p. 1-7.
[164] DEIR at p. 4.2-4; Appendix 31, Boyher, Lubrizol Advanced Materials, Inc., letter to DGS (November 28, 2007) at p. 4.
[165] DEIR at p. 4.2-4.
[166] DEIR at p. 4.2-11.
[167] Appendix 31, Boyher, Lubrizol Advanced Materials, Inc., letter to DGS (November 28, 2007) at p. 4.
[168] *Id*. at p. 3.
[169] *Id*. at p. 4.

As a result, at least one reputable PEX manufacturer admits that PEX certified to ASTM F2023 "only has an expected service life of 25 years, five years less than the traditional home loan."[170]

A 25-year expected service life means that many homes plumbed with ASTM F2023-certified PEX are likely to suffer failures and water damage well before the conservative 40-year lifetime assumed by Mitigation Measure 4.2-1. Moreover, buildings re-plumbed with the same pipe may experience multiple failures during a building's lifetime, while most copper pipes will last a building's lifetime and more. This is a significant impact that must be evaluated and mitigated in a revised DEIR.

The DEIR's failure to address this impact is puzzling since it expressly acknowledges that the level of certainty provided by ASTM F2023 is not as great as that provided by NSF P171 because of the failure to incorporate a design factor.[171]

Moreover, the lead agency received NOP comments from a major U.S. PEX manufacturer, Lubrizol Advanced Materials, Inc., that expressly warned that the ASTM standards are insufficient and should not be relied upon.[172] Lubrizol Advanced Materials, Inc. underscored the inadequacy of ASTM F2023 by noting that Polybutylene ("PB") pipe passed ASTM F2023 and still failed miserably in U.S. water conditions.[173]

ASTM F2023 is not only less protective than the NSF standards, it is also less reliable. In his report commissioned by the lead agency, Dr. Chaudhuri concluded that the NSF chlorine resistance standard is more reliable that the ASTM standard because the NSF procedure has a higher requirement for testing data points.[174]

The DEIR, however, fails to evaluate or analyze the deficiencies of ASTM F2023 in any application other than in recirculating hot water systems in jurisdictions with chlorinated water. The failure to evaluate substantial evidence that the ASTM standard is insufficient to ensure a conservative lifetime for PEX even in traditional hot and cold water systems renders the DEIR legally inadequate.

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[170] *Id.*
[171] DEIR at p. 4.2-13.
[172] Appendix 31, Boyher, Lubrizol Advanced Materials, Inc., letter to DGS (November 28, 2007).
[173] *Id.* at p. 6.
[174] DEIR, Appendix C, Chaudhuri, ENSR, Memorandum re Comparison of Chlorine Resistance standards for PEX piping (April 7, 2008) at p. 1.

The DEIR must be revised to disclose and to mitigate this issue. Lubrizol Advanced Materials, Inc. concludes that the most appropriate, feasible and enforceable mitigation measure would be to require all PEX pipe in California (for traditional and recirculated systems) to be certified to the NSF P171 CL-R standard.[175] "Such a requirement would ensure that every piece of PEX pipe is rated for the worst case chlorinated water scenario."[176]

C. The DEIR Fails to Evaluate Failures in Installations that May Circulate Water at Temperatures Hotter than 140 Degrees Fahrenheit

The DEIR is also deficient because it fails to evaluate the potential failure of PEX in installations that require hot water to be at temperatures well above 140 degrees Fahrenheit. As proposed, the Project does not include any limits on the use of PEX in installations that require water hotter than 140 degrees Fahrenheit. Hot water increases the aggressiveness of chlorine in water, which degrades the chlorine protection added to the PEX pipe that decreases the PEX pipes' longevity.[177] Both the ASTM and the NSF standards test for chlorine resistance at *maximum* temperatures of 140 degrees Fahrenheit.[178] Accordingly, these chlorine resistance standards are not applicable for installations that use water at hotter temperatures.

In particular, many hospital and health care applications require hot water to be at temperatures well above 140 degrees Fahrenheit.[179] Current code requirements for these occupancies include 180 degrees Fahrenheit water for rinse water at automatic dishwashing equipment and 160 degrees Fahrenheit water for laundry, maintained over the entire wash and rinse period.[180] In order to supply this water temperature at the fixture, it will be necessary to provide hotter water at the source.[181]

While some PEX products claim they are rated for use at temperatures above 140 degrees Fahrenheit, none of these are tested and certified for chlorine resistance at temperatures above 140 degrees Fahrenheit. Accordingly, these standards may not be relied upon to protect such applications from premature

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[175] Appendix 31, Boyher, Lubrizol Advanced Materials, Inc., letter to DGS (November 28, 2007) at p. 6.
[176] *Id.*
[177] *Id.* at p. 5.
[178] DEIR, Appendix C, Chaudhuri, ENSR, Memorandum re Comparison of Chlorine Resistance standards for PEX piping (April 7, 2008) at p. 2.
[179] Appendix 7, OSHPD, ISOR, 2006 Code Cycle, Part 5 (Sept. 1, 2006) at p. 3; Appendix 8, OSHPD, ISOR, 2004 Code Cycle, Part 5 (May 2004).
[180] *Id.*
[181] *Id.*

failure. PEX should thus be prohibited from use in any applications that may carry water at temperatures above 140 degrees Fahrenheit.

D. The DEIR Improperly Relies on Inconsistent and Unregulated Manufacturer Installation Guides to Mitigate Failures Due to Exposure to Ultraviolet Light

The DEIR is also deficient because it inadequately evaluates the risk of premature PEX failure due to exposure to ultraviolet sunlight ("UV").

PEX is extremely sensitive to sunlight. Exposure to UV rapidly depletes stabilizer from PEX, dramatically reducing its lifespan.[182] The DEIR acknowledges this sensitivity, yet concludes that the risk of premature failure due to UV exposure is less than significant because: (1) it is an anomalous condition, and (2) most PEX manufacturers add UV resistant material into the pipe and include instructions to avoid UV degradation. The DEIR concludes that because of this, and because it is considered reasonable and feasible to comply with manufacturers instructions, the risk of PEX failure due to UV exposure is less than significant.[183]

This conclusion lacks foundation and is contrary to undisputed evidence in the record. An EIR must contain "facts and analysis, not just the bare conclusions of a public agency."[184]

Here, no evidence or analysis is provided to support the finding that UV exposure is an "anomalous condition." To the contrary, the DEIR's own factual descriptions and referenced documents make clear that UV exposure is a common occurrence on worksites. The DEIR states:

> PEX may be left exposed at construction work sites or laid under slab at the edges of the building where it could be exposed to sunlight during portions of the day, left exposed during pipe installation, slab pour, framing, and sheathing. In tract housing this can add up to a month or more of exposure.[185]

In addition to exposure at the worksite, PEX manufacturers admit that PEX may be exposed to UV throughout the distribution channel that the pipe travels.[186]

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[182] Exhibits B, D & E.
[183] DEIR at p. 4.2-13.
[184] *Santiago Water District v. County of Orange* (1981) 118 Cal.App.3d 818, 831.
[185] DEIR at p. 4.2-10.
[186] Appendix 31, Boyher, Lubrizol Advanced Materials, Inc., letter to DGS (November 28, 2007) at p. 5.

Moreover, the DEIR's reliance on the finding that "most" PEX manufacturers add UV resistant material into the pipe is arbitrary and capricious. While there is widespread acknowledgment of this problem in PEX installation guides, there are no minimum longevity standards or tests imposed for exposure to UV light.[187] By the DEIR's own admission, not all PEX manufacturers add UV resistant material into the pipe. The proposed Project includes no requirement to add UV resistance to PEX pipe or PEX pipe packaging and would likely result in installation of PEX with little or no UV protection. Even with such protections, however, maximum UV exposure is usually no more than 60 days.[188]

The DEIR's reliance upon manufacturer's instructions is also arbitrary and capricious. Manufacturer's instructions are not regulated and thus vary significantly from product to product. The DEIR relies on these instructions, however, without even reviewing their content. Without reviewing the manufacturer's instructions for each of the 271 currently approved versions of PEX, the lead agency has no foundation for relying on their content. Moreover, the DEIR fails to impose any requirements or performance standards on such instructions that would apply to any current or future versions of such instructions.

In addition, the DEIR assumes compliance with such instructions without any evidence to support such an assumption. There is no requirement to provide manufacturer instructions when PEX is purchased and no assurance that the end user will ever even see such requirements, much less read them. Dr. Clark testifies that, based on his extensive experience with PEX failures and other construction-related errors, it is not reasonable to assume that manufacturer's instructions are strictly applied or even known.[189] Moreover, Dr. Clark testifies that he has been at numerous field installations where there is more than one PEX product mixed and matched in the building, each with potentially different instructions and requirements.

Manufacturer's instructions are also insufficient to protect PEX pipe from harmful UV exposure because they are inconsistent and often vague as to how long PEX may be exposed to sunlight. The warnings against UV exposure by Upnor PEX vary between 15 or 30 days *depending on which public document you review*.[190] The warning contained in the Zurn PEX pipe installation guide states: "Excessive exposure to UV light will void the Zurn warranty," but fails to define what

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[187] Id.; See Appendix 36, Plastic Pipe and Fittings Association, Installation Handbook: Cross-linked Polyethylene (PEX) Hot and Cold Water-Distribution Systems (2002); Appendix 37, IPEX Installation Guide.
[188] DEIR at p. 4.2-10.
[189] Exhibit D at p. 3.
[190] Appendix 31, Boyher, Lubrizol Advanced Materials, Inc., letter to DGS (November 28, 2007) at p. 5.

constitutes "excessive exposure.[191]" This statement fails to provide any guidance on how long Zurn PEX pipe may actually be exposed to sunlight before it should not be used. This statement also fails to warn against leaving PEX exposed from the time it is laid up under slab and pulled up for future connections to the time the house is framed and sheathed. The warning is vague, fails to provide needed guidance and is reasonably likely to lead to some accidental overexposures during installation. Even other PEX manufacturers admit that such a warning is vague and meaningless.[192]

Manufacturer's instructions are further inconsistent as to whether PEX may be damaged by even indirect sunlight. US Brass, in Bulletin no: QT-131 (dated October 17, 1996) wrote to their customers: "Field tests have confirmed that QestPEX ™ material should not be stored in direct or *indirect* sunlight." The Bulletin warned that exposure to indirect sunlight will "void the Qest warranty."

Vanguard also has warned that PEX should not be exposed to direct or indirect sunlight. They informed one customer that even indirect sunlight through small vents in a crawlspace would damage PEX.[193] The same customer testified that he had personally observed that six brand new homes had been constructed across the street from him that contained PEX in their crawlspaces with nothing on the piping to protect from indirect sunlight.

Reliance on vague, unspecified, voluntary "manufacturer's instructions" violates CEQA's requirement that mitigation measures be specific, enforceable and effective. Mitigation measures that are "tentative and vague" are insufficient to reduce effects to less than a level of significance.[194] The DEIR's reliance on manufacturer's instructions is "tentative and vague" because the term "manufacturer's instructions" lacks any substantive definition.

The proposed Project does not include any provisions providing standards or oversight of PEX installation guide content. Moreover, PEX installation guidelines are not subject to any governmental or industry standards, regulations, guidelines or oversight. As a result, the warnings and instructions contained within various manufacturer guidelines vary widely in content, scope and specificity. The warnings they do contain are often incomplete, vague, inconsistent or lack sufficient guidance to ensure compliance. New smaller, less reputable manufacturers may enter the market with even less sophisticated or complete warnings. Moreover,

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[191] *Id*.
[192] *Id*.
[193] Appendix 38, Christopher Akins, personal communication with Famous Plumbing Supply (March 3, 2007), Hhttp://www.plumbingsupply.com/pex.htmlH.
[194] *League for Protection of Oakland's etc. Historic Resources v. City of Oakland* (1997) 52 Cal.App.4th 896, 909.

there is no requirement for a manufacturer to even have an installation guide. In addition, it is unrealistic and unreasonable to expect new occupants of a home to be aware of a manufacturer's instructions for plumbing pipe that may have been installed years earlier.

Without any specific guidelines or requirements regarding the availability, applicability and content of manufacturer's instructions, such requirements are too vague and tentative to be relied upon for mitigation.

Reliance on manufacturer's UV instructions also lacks foundation because there is no way to ensure compliance with such instructions. The DEIR fails to address the widely acknowledged concern that there is no way to visually inspect PEX pipe to determine if it has been affected by UV exposure and will likely prematurely fail.[195] Accordingly, there is no way to tell how long PEX pipe has previously been exposed to sunlight by prior handlers of the pipe, making compliance with any exposure guidelines virtually impossible. CEQA requires mitigation measures to be feasible and enforceable.[196] Reliance upon manufacturer guidelines to protect from UV exposure is neither feasible nor enforceable.

Even PEX manufacturers admit that "no one knows how long a piece of PEX pipe or a coil of PEX pipe has been exposed to UV throughout the distribution channel that the pipe travels."[197]

> No guidelines exist for UV protective packaging for PEX pipe. PEX pipe can be transported by an open air flatbed truck that allows UV exposure of the PEX pipe. A flatbed truck may unload the PEX pipe at the wholesaler who then may store the PEX pipe outside in their yard, again exposed to UV. PEX pipe is purchased by the plumbing contractor and the pipe is placed in the back of an open truck for a day, week, month or longer until all of the PEX pipe is used. The PEX pipe is installed in a house where the UV blocking walls might not be installed for days, weeks, or longer.[198]

This unidentifiable accumulated time makes compliance with manufacturer UV exposure guidelines virtually impossible for even the most conscientious installers to ensure.[199]

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[195] Exhibit B, D & E; Appendix 31, Boyher, Lubrizol Advanced Materials, Inc., letter to DGS (November 28, 2007) at p. 5.
[196] Pub. Resources Code, § 2106.1; CEQA Guidelines § 15364.
[197] Appendix 31, Boyher, Lubrizol Advanced Materials, Inc., letter to DGS (November 28, 2007) at p. 5.
[198] *Id.*
[199] *Id.*

Finally, the DEIR lacks any foundation for its assumption that compliance with manufacturer instructions with UV guidelines will reduce the risk of premature failure to a level of insignificance. Dr. Clark has performed tests on PEX tubing demonstrating that some brands of PEX become virtually devoid of residual effective stabilizer after just two weeks of rooftop exposure.[200] At such a rate, just three days of exposure to sun at a construction site could reduce the lifespan of PEX by more than twenty percent (20%).[201] Other studies have found a one-week exposure to sunlight sufficient to cut the resulting pipe lifetime in half.[202]

The ASTM and NSF chlorine-resistance standards fail to take into account a manufacturer's maximum allowable UV exposure. Accordingly, PEX pipe that is exposed to UV even within the manufacturer's guidelines will have significantly fewer stabilizers than relied upon in setting the ASTM and NSF chlorine-resistance standards. While this may not mean failure in 1 to 2 years, it could mean failure in 15 to 20 years rather than 40 years.

The DEIR must be revised to evaluate the impact of UV exposure on PEX lifetime and to identify enforceable mitigation measures based on actual empirical data.

E. The DEIR Improperly Relies on Inconsistent and Unregulated Manufacturer Installation Guides to Mitigate Failures Due to Exposure to Incompatible Firestop Materials

The DEIR is also deficient because it improperly relies on inconsistent and unregulated manufacturer installation guides to mitigate failures due to incompatible firestop materials. Firestop material is required between walls to prevent pipes from acting like a fuse and spreading fire. One commonly used material that has been found to accelerate the loss of stabilizers in PEX is intumescent firestop material.[203] The DEIR acknowledges that certain firestop materials are incompatible with PEX and may lead to premature pipe rupture.[204]

The DEIR, however, summarily dismisses this potential impact on the grounds that "many readily available firestop materials are compatible with PEX, and the information about which materials are appropriate to use with PEX is readily available."[205] The DEIR states that "most" PEX manufacturer's installation

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[200] Exhibit D & E.
[201] *Id.*
[202] Exhibit B at p. 5-6.
[203] Exhibits B, D & E; see Appendix 36, Plastic Pipe and Fittings Association, Installation Handbook: Cross-linked Polyethylene (PEX) Hot and Cold Water-Distribution Systems (2002).
[204] DEIR at pp. 4.2-10.
[205] DEIR at p. 4.2-11.

guides warn against this incompatibility and "most" firestop materials are labeled to indicate whether they are compatible with PEX.

The DEIR's reliance upon manufacturer warnings and instructions regarding firestop materials is arbitrary and capricious because the lead agency has not reviewed the warnings and instructions for all 271 types of PEX. While some PEX installation guides warn against the use of intumescent firewall penetration sealing compounds, not all PEX installation guides warn users of this incompatibility.[206] The failure of all PEX guides to warn against this incompatibility makes reliance on PEX manufacturer's instructions an insufficient safeguard to prevent this impact.

Moreover, as observed generally by OSHPD, this type of limitation is difficult to enforce.[207] OSHPD reviewed this issue in 2006 and concluded that, even if drawings call for the use of water soluble, gypsum-based caulking with PEX, materials may be changed from what is approved on the drawings by contractors unaware of the repercussions of using more common intumescent firestop materials.[208] OSHPD further concluded that "[r]equiring field staff to know all the chemical composition of all the materials, and adverse interactions with chemicals found in other materials is not a reasonable expectation."[209]

OSHPD is the enforcing agency for all health facility construction projects. OSHPD not only regulates such construction, it is also responsible for permitting, inspection and enforcement.[210] As such, OSHPD's expert opinion as to the feasibility of this mitigation for construction under its jurisdiction must be given deference.

In addition, warnings and instructions on firestop material itself are also insufficient to reduce this impact to a level of insignificance. In his investigation of PEX failures in Washington, Dr. Clark found that at least one firestop material specifically labeled safe for use with PEX pipe dramatically accelerated the loss of stabilizer.[211] As a result, the PEX pipe quickly became yellow, embrittled and cracked. This firestop material was the "Triple S Intumescent Sealant specifically referred to in the DEIR as "designed to be compatible with PEX."[212]

The DEIR must be revised to more meaningfully evaluate and mitigate the potential for PEX failure due to exposure to incompatible firestop material.

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[206] See, e.g., Appendix 52, Zurn PEX Plumbing Design and Application Guide.
[207] Appendix 7, OSHPD, ISOR, 2006 Code Cycle, Part 5 (Sept. 1, 2006) at p. 3; Appendix 8, OSHPD, ISOR, 2004 Code Cycle, Part 5 (May 2004).
[208] *Id.*
[209] *Id.*
[210] *Id.* at p. 1.
[211] Exhibit D & E.
[212] Exhibit D at p. 4; DEIR at p. 4.2-10.

F. The DEIR Fails to Evaluate the Risk of PEX Failures Due to Exposure to Solvents, Petroleum Products and Asphalt

In addition to inadequately evaluating PEX failures due to UV exposure or exposure to intumescent firestop material, the DEIR fails to disclose or evaluate the potential for PEX to prematurely fail due to exposure solvents, petroleum products and asphalt.

Dr. Clark testifies that a broad range of commonly encountered construction materials and environmental conditions may cause PEX pipes to fail. As discussed in section V *supra*, PEX is very sensitive to permeation in the presence of benzenes, gasoline, pesticides, termiticides and many other contaminants commonly found in soils underneath homes.[213] Many of the same materials that may permeate through PEX pipe, also attack and consume the PEX stabilizers as they pass through the polymer.[214] Dr. Clark characterizes this sensitivity as an "inherent weakness" of PEX. This "inherent weakness" may cause PEX pipe to prematurely fail, for example, where PEX is installed in contact with contaminated soil under slab or between the house and the meter. It may also cause PEX pipe to fail where it is laid out unprotected on asphalt.

The DEIR must be revised to disclose and evaluate these potential impacts.

G. The DEIR Fails to Evaluate the Risk of PEX Failure Due to the Cumulative Loss of Stabilizers from Various Commonly Encountered Oxidants

The DEIR fails to evaluate and mitigate for potential premature PEX failures as a result of cumulative exposure to oxidants from a variety of sources. In his attached comments, Dr. Clark testifies that exposure to various commonly encountered oxidants at levels that may not individually result in premature failure may cumulatively cause premature degradation.

For instance, PEX manufacturers admit that exposure to metal ions of copper and iron can promote oxidation resulting in accelerated consumption of the PEX stabilizers.[215] As Dr. Clark points out, potable water for domestic consumption will be oxygenated, will likely be chlorinated, and will be subject to the presence of metal ions both from the water sources and from water transmission systems. Each of these items alone results in consumption of PEX stabilizers. Where such a

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[213] Exhibits D & E; Appendix 36, Plastic Pipe and Fittings Association, Installation Handbook: Cross-linked Polyethylene (PEX) Hot and Cold Water-Distribution Systems (2002).
[214] *Id.*
[215] Exhibit E at pp. 5 & 8.

common triumvirate of conditions exists, PEX may suffer from accelerated loss of its stabilizers, potentially resulting in premature failure.[216] Exposures to UV rays, organic solvents or firestop materials will further increase the likelihood that stabilizer loss from exposure to chlorinated water will result in premature failure.[217]

Such cumulative impacts are not addressed by ASTM or NSF standards or testing.[218] As a result, Dr. Clark concludes that a manufacturer's claim that its piping is compliant with ASTM and NSF codes and standards is insufficient to ensure long-term serviceability under the environments commonly encountered in the intended use of PEX.[219]

Premature failure may occur from cumulative attacks even when each source of attack is individually insignificant. For example, UV exposure well within the limits of manufacturer instructions may nonetheless result in premature failures when combined with the cumulative impact of other oxidants. "The more UV PEX pipe is exposed to, the greater the amount of chlorine anti-oxidant additive package that is depleted, lessening PEX pipes protection against chlorinated potable water systems."[220]

These cumulative impacts are further significant because the ASTM and NSF standards fail to fully take such impacts into account. The DEIR states that most PEX products limit UV exposure to 30 to 60 days. According to Dr. Clark's investigations, even one week of UV exposure significantly reduces the effective lifetime of PEX antioxidants.[221] The ASTM and NSF standards, however, test PEX without any UV exposure. Accordingly, PEX pipe that is exposed to UV, even within the manufacturer's guidelines, will have significantly fewer stabilizers available to resist chlorine degradation than were relied upon to determine compliance with the ASTM and NSF chlorine-resistance standards. As discussed above, this does not necessarily mean failure in 1 to 2 years, but it could likely result in some PEX pipe brands failing in 15 to 20 years rather than 40 years.

To address the cumulative impacts of UV exposure and hot chlorinated water, the lead agency must require PEX products sold in California to be certified to meet NSF chlorine resistance standards even after the maximum allowable UV exposure for that product. In addition, all PEX piping installed in California should

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[216] *Id.*
[217] *Id.*
[218] *Id.*
[219] *Id.*
[220] Appendix 31, Boyher, Lubrizol Advanced Materials, Inc., letter to DGS (November 28, 2007) at p. 5.
[221] Exhibit E at pp. 4 & 7.

be required to meet the stricter NSF P171 CL-R standard for chlorine resistance in order to build an additional buffer against other potential cumulative exposures.

H. The DEIR Fails to Examine the Adequacy of PEX Performance Standards in Light of Reports of Widespread Failures of PEX Pipe and Fittings

The DEIR is further deficient because it fails to evaluate the widespread failures of PEX pipe and PEX fittings that have led to numerous class action lawsuits across the United States. These failures are relevant to the adequacy of PEX performance standards because all of these failures involved PEX and PEX fittings that met the very NSF and ASTM standards that are now being relied upon by the DEIR to conclude that the risk of PEX failures is less than significant.

1. Washington State Failures

In his attached comments, Dr. Clark presents substantial evidence that catastrophic failures have occurred in PEX piping. These failures were the subject of a class-action lawsuit in Washington State. Similar failures have been reported in Canada in both open-loop hydronic systems and hot potable water lines. The DEIR acknowledges these failures, but dismisses them on the grounds that the Washington State failures all involved a specific lot of PEX (UltraPEX Lot 7 tubing) produced by a single manufacturer that is no longer in business. Based upon the assumption that these failures were all attributed to the same "specific defective lot," the DEIR concludes that "[s]uch failures are not representative of the entire PEX industry."[222]

The DEIR's conclusion that these failures were attributable to a single "defective" lot lacks foundation. There is no evidence the UltraPEX Lot 7 pipes were not correctly fabricated. To the contrary, all tested UltraPEX tubing material, including material subject to early failure, was adequately cross-linked, indicative that the approximately correct levels of ingredients were employed.[223] In addition, the UltraPEX Lot 7 pipes met ASTM and NSF standards, including the NSF standard for chlorine resistance.[224] Moreover, "Lot 7" was not some minor subset of Plasco production; Lot 7 was the designation for *all* Plasco production of piping made from Flexet resin, estimated at hundreds of miles.

The DEIR's conclusion that these failures are not representative of the entire PEX industry also lacks foundation. The DEIR fails to investigate these failures and to determine exactly why this pipe failed. Moreover, the evidence in the record

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[222] DEIR at p. 4.2-10.
[223] Exhibit D at p. 1.
[224] *Id.*

regarding the Ultra-PEX Lot 7 pipe failures does not support a conclusion that other PEX pipes will not or have not experienced premature failures.

Dr. Clark has concluded that the potential for such failures is not limited to UltraPEX lot 7 piping:

> It is my belief that while the Washington State failures involve a single manufacturer, the issues revealed as a result of these losses are not solely limited to the batch of pipe involved in these failures. These failures demonstrate that PEX pipe may potentially prematurely fail if exposed to a number of commonly encountered materials and environmental conditions, including chlorine, sunlight, metal ions, high temperature and solvents, including those in some firestopping materials.[225]

As discussed above, all PEX products suffer from the same inherent vulnerabilities that plagued UltraPEX. Furthermore, the UltraPEX Lot 7 pipe failed despite conforming to all of the required ASTM and NSF performance standards. The consistent, widespread failure of UltraPEX Lot 7 tubing suggests that the problem was not quality control, but rather insufficient standards that allow certification of a poor product.

In other words, just because the DEIR identifies only one brand of PEX pipe that has consistently failed in such a dramatic and rapid fashion, this does not prove that all other PEX pipe has performed or will perform adequately. The lesson that must instead be taken from the widespread failure of UltraPEX pipe is that conformance with ASTM and NSF standards does not, in itself, guarantee that PEX will not prematurely fail in a manufacturer allowed application.[226] The DEIR must be revised to evaluate the Washington State failures and to determine why they failed despite compliance with ASTM and NSF standards.

2. Failures in Europe and Canada

The DEIR is further deficient because it fails to evaluate other reports of widespread PEX failures in Europe and Canada. On August 13, 2003, HCD was forwarded an e-mail that had been sent unsolicited to the Governor's Office of Planning and Research from Scott MacKay, president of EnerMac Consultants, Inc., a consulting firm located in Alberta, Canada.[227] In this e-mail Mr. MacKay stated that he had read that California was considering the approval of PEX piping and that he thought they should be aware that PEX was starting to fail in Washington

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[225] Exhibit E at p. 1.
[226] Exhibits D & E.
[227] Appendix 39, Bill Stack email to Dave Walls (August 13, 2003).

State and in Canada.[228] He also stated that he had studies that also identified PEX failures in Europe.[229] Finally, Mr. MacKay invited California officials to e-mail him back if they needed any further information.

Responses to Public Record Act requests provided by CBSC, HCD and DGS revealed that they neither emailed Mr. MacKay, nor followed up on any of the information that he supplied to HCD.[230] The failure to investigate Mr. MacKay's statements enlarges the scope of fair argument and thus supports a finding that PEX may already be experiencing premature failures in Canada and Europe.[231] By failing to follow up on information that was provided them on PEX failures in Europe, the DEIR lacks foundation for its conclusion that the risk of such impacts is less than significant.

3. Failure of PEX Fittings

The DEIR is also inadequate because it fails to evaluate reports of widespread failures of PEX fittings by at least two different manufacturers. Numerous class action lawsuits have been filed across the United States as the result of water damage due to these failed PEX fittings.

There have been at least two federal court class actions filed against Zurn for failure of their PEX fittings: *Denise Cox and Terry Cox v. Zurn PEX, Inc.*, filed in Minnesota on August 8, 2007, and *Beverly Barnes and Brian Johnston v. Zurn PEX, Inc.,* filed in North Dakota on October 23, 2007. Lawsuits against Zurn for failure of their PEX fittings have also been filed in Colorado (*Coppersmith Plumbing v. Zurn PEX, Inc.,* filed on May 5, 2008) and Montana (*Nicodemus v. Zurn PEX, Inc.,* filed on May 12, 2008).

In addition there have been class action suits filed against Kitec for failure of their PEX fittings in Las Vegas (*In re Kitec*, filed on February 15, 2006) and New Mexico (filed March 14, 2007). In Clark County, Nevada alone, there are 31,000 homes in which Kitec pipe fittings failed.

Without any independent evaluation, the DEIR states that, according to the plaintiffs, the failures appear to be related to either a design or manufacturing defect of the fittings. The DEIR then concludes that these failures are "not relevant to the general issue of potential PEX failure.[232]

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[228] *Id.*
[229] *Id.*
[230] Appendix 32, Declaration of Thomas A. Enslow.
[231] *Leonoff v. Monterey County Bd. of Supervisors* (1990) 222 Cal.App.3d 1337, 1348.
[232] DEIR at p. 4.2-10.

This conclusion lacks foundation and ignores the scope of the proposed Project. The Proposed project would approve both PEX pipe and PEX fittings, including the very metal insert fittings that are at the heart of these class action lawsuits.[233] The DEIR dismisses these failures, however, without any investigation of why the failures occurred. These failures are relevant because these fittings were certified to meet all relevant NSF and ASTM performance standards. Moreover, these failures involved fittings from more than one manufacturer. The failure of the DEIR to evaluate these failures whatsoever renders this document legally inadequate.

The DEIR must be revised to evaluate why these fittings failed despite meeting relevant NSF and ASTM performance standards and must identify mitigation measures to ensure that such failures do not continue to occur in the future.

4. The Failures of PEX Pipe and Fittings Underscore the Inadequacy of Reliance on the ASTM and NSF Standards to Ensure the Mechanical Reliability of PEX Pipe

Dr. Clark testifies in his comments that these failures demonstrate that the quality of PEX tubing and fittings may vary widely despite compliance with required industry performance standards. "While NSF and ASTM standards provide some assurance of quality, these standards do not eliminate the possibility of premature failures. These industry standards are limited in scope and do not fully reflect real life applications."[234] As a result, some PEX tubing and fittings may last 60 years, a few (such as UltraPEX Lot 7 pipe and Zurn brass fittings) may last only a couple of years, and others may start failing at more intermediate periods of time – 10, 15, 20 years.

Moreover, entire batches of PEX do not need to fail for PEX to experience significant failures. Most brands of PEX will likely last for a reasonable lifetime under ideal conditions. However, PEX pipe installations and life experiences are not uniform. PEX pipe is likely to be exposed to a wide variety of environments and building materials, resulting in cumulative attacks on the integrity of PEX pipe that will vary in intensity from installation to installation. As a result, versions of PEX pipe that perform effectively in the vast majority of installations, may still fail spectacularly and prematurely when exposed to numerous commonly encountered environments and building materials.

Dr. Clark testifies that the foremost problem facing the user and the regulator is the lack of access to data that provides a basis for decisions on

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[233] DEIR at p. 3-5; 24 Cal. Code Regs., Part 5, §§ 604.1, 604.11.1 & Table 6-4.
[234] Exhibits D & E.

individual product adequacy.[235] Indeed, many PEX piping manufacturers have not investigated and are unable to provide data on the behavior of their product under conditions of exposure that regulators should consider for safety, such as sensitivity to sunlight or sensitivity of cumulative exposures.[236]

Because the industry standards relied upon to support the proposed Project fail to ensure adequate protection from individual and cumulative exposures to commonly encountered environments and building materials, reliance on these industry standards is insufficient to reduce the risk of premature failure to a level of insignificance. The insufficiency of these standards is underscored by the reported failures of PEX and PEX fittings that were certified to meet these standards. Recent reports of widespread failures of Kitec PEX-AL-PEX tubing further underscore the inherent susceptibility of this compound to premature failure.[237]

The DEIR must be revised to evaluate why these failures occurred despite conformance with NSF and ASTM performance standards. Only by such an evaluation can appropriate mitigation be identified and imposed to ensure that such massive failures do not also occur in California.

VII. THE DEIR FAILS TO ADEQUATELY EVALUATE POTENTIAL IMPACTS DUE TO THE TENDENCY OF PEX TO PROMOTE THE GROWTH OF SIGNIFICANT BIOMASS WITH ABUNDANT VIRUS-LIKE PARTICLES

The DEIR must also be revised to more meaningfully evaluate the potential health risk posed by the tendency of PEX to promote the growth of significant biomass with abundant virus-like particles.

Numerous studies and articles comparing potable water pipe materials, including variants of PEX, PB, PP, CPVC, copper and steel, have found that PEX displayed the strongest biofilm formation and the strongest promotion of the growth of Legionella bacteria.[238] However, a 2005 study by Dick van der Kooij, et al., suggested that this was only a short-term effect. The 2005 van der Kooij study found that, under experimental conditions, Legionella concentrations in water and biofilms were at the same levels for all materials after 2 years.

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[235] Exhibit E.
[236] *Id.*
[237] Exhibit D at p. 2; Appendix 28, HeatingHelp.com, Email Thread re IPEX takes care of our customers, (January 5, 2005).
[238] Exhibits F & G.

Based on this study, the DEIR concludes that PEX does not increase the risk of Legionella. As discussed more fully in the attached comments of Michael Krause, Senior Industrial Hygienist for Veritox, Inc., this conclusion fails to fully address the concerns over pathogens and biofilm formation in PEX.

First, the DEIR fails to address the higher short-term rates of Legionella growth in PEX compared to other potable water pipe materials. The 2005 van der Kooij study suggested that the conditions promoting rapid biomass development in PEX caused a large increase (about 100-fold) of the Legionella to attached and suspended biomass ratio, thus resulting in strongly elevated concentrations of Legionella in the water.[239] The study further warned that incidentally elevated Legionella concentrations might remain undetected at a low monitoring frequency. The DEIR must be revised to evaluate the short-term impacts from strongly elevated concentrations of Legionella in water sitting PEX pipe during the first 200 days of installation.

Second, the DEIR fails to address the concerns over the significantly higher biomass found in PEX even after two years and the potential for this biomass to promote virus-like particles. The 2005 van der Kooij study found that, even after two years, the concentrations of attached and suspended biomass in the PEX pipes were up to five times higher than those in copper pipes (750 pg ATP/cm2 for Copper pipe versus 3,700 pg ATP/cm2 for PEX pipe). The 2005 van der Kooij study finds that the long-term effect of PEX on biomass production remains unclear and requires further study.[240]

The DEIR erroneously dismisses this finding because it considers only Legionella in the discussion of pathogens. Biofilms, however, can harbor a variety of pathogenic bacteria and viruses in addition to Legionella. These pathogens include E. Coli, Pseudomonas, Mycobacter, Campylobacter, Klebsiella, Aeromonas, Heliobacter pylori, and Salmonella typhimurium.[241] The significantly denser biomass found in PEX pipe may increase the likelihood of such pathogens contaminating drinking water. The 2004 Lehtola study found virus-like particles to be twice as abundant in PEX pipe than in copper.[242] The DEIR itself finds that "higher amounts of biofilm could lead to increased risk of human contact with pathogenic bacteria."[243] Nonetheless, the DEIR fails to evaluate the potential risks associated with the van der Kooij biofilm growth results.

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[239] Appendix 41, Van der Kooij, et al., *Biofilm formation and multiplications of Legionella in a model warm water system with pipes of copper, stainless steel and cross-linked polyethylene* (2005) 39 Water Research at p. 2797.
[240] *Id.*
[241] Exhibit G at p. 2.
[242] *Id.*
[243] DEIR at p. 4.2-6.

Third, the DEIR fails to address the risks of sanitizing PEX pipe when Legionella or other pathogenic outbreaks occur. When problems do develop, the commonly used methods of sanitizing infected piping such as exposing them to heat or high levels of biocide chemicals can damage PEX and lead to premature failure.[244] Such methods would have virtually no effect on the service life of metal pipe.[245]

The proposed Project would approve the use of PEX in schools, daycare facilities, hospitals, health care facilities and nursing homes. The DEIR, however, fails to evaluate the potential for PEX pipe to pose a greater risk to the more vulnerable populations of these occupancies.

In its 2004 and 2006 reviews of PEX, OSHPD stated:

> OSHPD is charged with the promulgation of regulations to protect the health and safety of the occupants of hospitals, skilled nursing facilities, licensed clinics and correctional treatment facilities. We must be conservative in the adoption of regulations, considering the vulnerable users of these facilities. Additional research and testing must be performed to demonstrate the safety and reliability of this new material before it can be accepted for use in health facilities.[246]

Because of the uncertainty posed by the tendency of PEX to promote the growth of significant biomass with abundant virus-like particles and the problems posed when PEX pipe must be sanitized after a pathogenic outbreak, the DEIR must reconsider the appropriateness of approving PEX for installation in occupancies that may house particularly sensitive and immune-compromised populations.

VIII. THE DEIR FAILS TO ADEQUATELY EVALUATE THE PROJECT'S POTENTIAL SOLID WASTE IMPACTS

The DEIR lacks foundation for its conclusion that the Project will have not significant impact on solid waste. Replacing a building material that lasts the lifetime of the building has a 100% recycling rate with a material that has a 25-year life span and is not recycled in any meaningful amount creates an inherent solid waste impact.

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[244] Exhibit F.
[245] *Id*.
[246] Appendix 7, OSHPD, ISOR, 2006 Code Cycle, Part 5 (Sept. 1, 2006) at p. 3; Appendix 8, OSHPD, ISOR, 2004 Code Cycle, Part 5 (May 2004).

A 2005 report by the San Francisco Department of the Environment examined the solid waste problem posed by various types of plastic pipe and found that PEX was "inherently difficult to recycle."[247] The San Francisco report found that PEX was the only type of plastic piping that no plastic recycler would accept.[248] PEX recycling is hampered by the cross-linking of the molecules. Cross-linked plastics are known as "thermoset" plastics. A thermoset plastic is hardened by curing, creating a three dimensional, inter-connected structure that cannot be remelted or remolded. It is infusible and insoluble. This makes thermosets like PEX very difficult to recycle. The only current recycling option for PEX is to grind it down and use it as filler for another material.[249]

Copper pipe, on the other hand, has an almost 100% recycling rate. The proposed statewide approval of PEX and PEX-AL-PEX would potentially replace a recyclable building material with a material that is inherently not recyclable. The approval of PEX and PEX-AL-PEX thus may potentially add to California's increasing solid waste disposal burden.

Moreover, the shorter lifespan of PEX piping will increase the frequency of necessary re-piping. PEX pipe that meets only the minimum ASTM F2023 standard will need to be re-piped once every 25 years. In contrast, copper piping can easily last 100 years or more. As a result, the number of PEX re-pipes could conceivably quadruple the amount of waste generated due to re-pipes.

The DEIR is further deficient due to its faulty assumption that PEX pipe may be reused. As discussed in detail *supra*, all PEX pipe eventually fails due to the consumption of its stabilizers by chlorine and other antioxidants. Because there is no way to tell how much stabilizer a pipe has left, it is simply not credible to assume that a significant number of people would take the risk of reusing PEX pipe from a demolished house.

Finally, the DEIR is deficient because it only looks at the direct impact of PEX pipe on landfill capacity and does not evaluate the cumulative impact of replacing a 100% recycled material with a material that is not recycled in any meaningful amount.

The DEIR's dismissal of this impact lacks foundation and credibility. The DEIR must be revised to more meaningfully evaluate this impact.

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[247] Appendix 42, Rossi, et al., *Plastic Pipe Alternatives Assessment*, San Francisco Department of the Environment, (February 11, 2005) at p. 3.
[248] *Id.* at 14.
[249] *Id.* at 16.

IX. THE DEIR FAILS TO ADEQUATELY EVALUATE THE EMISSION OF TOXIC SUBSTANCES FROM PEX PIPE BURNED IN BUILDING FIRES

The DEIR is further deficient because it fails to adequately address the risk of toxic smoke when PEX is burned in building fires. The DEIR states that testing and field data indicate that gases emitted from plastic piping are not more toxic than other common building and furnishing materials in structures.[250] The DEIR, however, fails to disclose what toxic gases are actually emitted from PEX and what sort of cumulative danger they may pose to building occupants or firefighters. The mere fact that other building materials may also emit toxic gases when burned does not absolve the lead agency from evaluating the toxic gases that may be emitted from PEX pipe and fittings.

An EIR must contain facts and analysis that provide a road map to how an agency has reached its conclusions.[251] Mere conclusory pronouncements are not sufficient. A legally adequate evaluation of a potential impact "must contain sufficient detail to help ensure the integrity of the process of decision-making by precluding stubborn problems or serious criticism from being swept under the rug."[252]

Here, the DEIR fails whatsoever to disclose or investigate what toxic substances may be emitted from PEX pipe and fittings during a building fire. The failure to disclose what toxic substances may emit from PEX when burned violates CEQA's mandate for full public disclosure and consideration of potential impacts.[253] Because of this omission, important ramifications of the proposed Project may remain hidden from view at the time of Project approval.[254]

The DEIR further assumes, without foundation, that PEX pipe poses a less significant fire risk because plastic piping is installed behind walls.[255] This assumption fails to take into consideration common electrical fires that actually start within building walls. Because such fires are initially hidden from view, toxic smoke from smoldering PEX piping may enter the living space even before occupants are aware there is a fire.

Finally, the DEIR fails to evaluate the cumulative impacts of adding additional toxic-smoke producing material into a building. "Cumulative impacts

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[250] DEIR at p. 4.1-7.
[251] See *Citizens of Goleta Valley v. Board of Supervisors*, *supra*, 52 Cal.3d at 568.
[252] *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 733.
[253] *See Santiago Water District v. County of Orange* (1981) 118 Cal.App.3d 818, 830.
[254] *Id.*
[255] DEIR at p. 4.1-7.

can result from individually minor but collectively significant projects taking place over a period of time."[256]

The DEIR's statement that the quantity of PEX materials is relatively insignificant when compared to all the other materials within the building does not mean that the installation of PEX pipe and fittings does not have significant cumulative impacts. This theory was rejected in *Kings County* because it would allow "the approval of projects which, when taken in isolation, appear insignificant, but when viewed together, appear startling."[257] The proper standard for a cumulative impacts analysis is whether the impacts are "collectively significant."[258]

Further information on the toxicity of PEX smoke is needed to fully evaluate whether PEX poses a significant direct or cumulative risk to firefighters and households due to its potential creation of toxic smoke when burned. The DEIR must be revised to disclose what toxic substances may be emitted from PEX pipe during building fires and to determine if such smoke may be individually or collectively significant.

X. CONCLUSION

This letter and the attached expert comments describe in detail numerous failures of the DEIR to disclose, evaluate and mitigate potential impacts of the Project. As a result, the DEIR fails in significant aspects to perform its function as an informational document that is meant "to provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on the environment" and "to list ways in which the significant effects of such a project might be minimized."[259] Because the DEIR fails to comply with the requirements of CEQA, it may not be used as the basis for approving the Project.

The Coalition for Safe Building Materials respectfully requests that CBSC withdraw the DEIR and revise it to fully and completely address the issues and evidence that we have presented. The revised DEIR must then be recirculated for public review.

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[256] CEQA Guidelines § 15355, subd. (b).
[257] *Kings County Farm Bureau v. City of Hanford, supra,* 221 Cal.App.3d at p. 720-21.
[258] *Id.* at p. 721, citing CEQA Guidelines § 15355.
[259] *Laurel Heights I, supra,* 47 Cal.3d at 391.