

EDO Principal Correspondence Control

FROM: DUE: / /

EDO CONTROL: G20120499
DOC DT: 07/02/12
FINAL REPLY:

Jacob D. Paz
Las Vegas, Nevada

TO:

Chairman Macfarlane

FOR SIGNATURE OF :

** GRN **

CRC NO: 12-0319

DESC:

Yucca Mountain License Application
(EDATS: SECY-2012-0353)

ROUTING:

Borchardt
Weber
Johnson
Ash
Mamish
OGC/GC
Collins, RIV
Chen, OEDO

DATE: 07/12/12

ASSIGNED TO:

CONTACT:

NMSS

Haney

SPECIAL INSTRUCTIONS OR REMARKS:

For Appropriate Action.

EDATS Number: SECY-2012-0353

Source: SECY

General Information

Assigned To: NMSS

OEDO Due Date: NONE

Other Assignees:

SECY Due Date: NONE

Subject: Yucca Mountain License Application

Description:

CC Routing: RegionIV

ADAMS Accession Numbers - Incoming: NONE

Response/Package: NONE

Other Information

Cross Reference Number: G20120499, LTR-12-0319

Staff Initiated: NO

Related Task:

Recurring Item: NO

File Routing: EDATS

Agency Lesson Learned: NO

OEDO Monthly Report Item: NO

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Action Type: Appropriate Action

Priority: Medium

Signature Level: No Signature Required

Sensitivity: None

Approval Level: No Approval Required

Urgency: NO

OEDO Concurrence: NO

OCM Concurrence: NO

OCA Concurrence: NO

Special Instructions: For Appropriate Action.

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Originator Name: Jacob D. Paz

Date of Incoming: 7/2/2012

Originating Organization: Citizens

Document Received by SECY Date: 7/12/2012

Addressee: Chairman Macfarlane

Date Response Requested by Originator: NONE

Incoming Task Received: Letter

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CORRESPONDENCE CONTROL TICKET

Date Printed: Jul 12, 2012 11:44

PAPER NUMBER: LTR-12-0319

LOGGING DATE: 07/12/2012

ACTION OFFICE: EDO

AUTHOR: Dr. Jacob Paz

AFFILIATION: NV

ADDRESSEE: CHRM Allison Macfarlane

SUBJECT: Concerns the Yucca Mountain License Application

ACTION: Appropriate

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LETTER DATE: 07/02/2012

ACKNOWLEDGED No

SPECIAL HANDLING:

NOTES:

FILE LOCATION: ADAMS

DATE DUE:

DATE SIGNED:

EDO --G20120499

Dr. Jacob D Paz
5440 Count Carlson Cir.
Las Vegas, NV 89119-1367

July 2, 2012

The Honorable Dr. Allison Macfarlane,
Chair of the Nuclear Regulatory Commission
11545 Rockville Pike
Rockville, MD 20852

Dear. Dr. Macfarlane,

I am enclosing two documents as to why the Yucca Mountain License Application is incomplete and should be set aside on the grounds of:

1. The Department of Energy did noncompliance with NRC letter dated March 30, 2009 required the DOE to provide and submit a Supplement Environmental Impact Statement (see attachments 1-2).
2. A more recent a "White paper on the CDC Blog published on November 22, 2011 on the Health of Eironite" (see attachment 3-4). Eriornite mineral posed serious health hazards to workers and visitors, the health and safety precaution take by DOE are inadequate.

If you have any questions please feel free to communicate with me either by phone at 702-326-5857 or, by e-mail at drjacobp1@yahoo.com.

Yours,



Dr. Jacob D Paz
Cc: NV Congressional Delegation
State of Nevada

Dr. Jacob D. Paz
5440 Count Carlson Cir
Las Vegas, NV 89119
drjacobP1@yahoo.com
702-326-5857

June 20, 2012

The Honorable Barak H. Obama
The President
The White House
Washington, DC 20500
president@whitehouse.gov

RE: Yucca Mountain License Application

Dear Mr. President,

I am writing to you in regard to the Yucca Mountain Application and law suit pending at the U.S. Court of Appeals District of Columbia. It is my contention that the Sectary of Energy, Mr. Chu can and has the power to withdraw the Yucca Mountain License Application (LA) on the grounds that the previous administration submitted an incomplete LA.

Specifically, in a letter dated March 30th 2009, the Nuclear Regulatory Commission (NRC) stated the following: "With regard to your concern about DOE's EISs (Department of Energy's Environmental Impact Statements), the NRC staff agrees that DOE's analysis did not provide an adequate discussion of the cumulative amounts of radiological and non-radiological contaminants that may enter groundwater over time, and how these contaminants would behave in the aquifer and related environment. We found that this failure to adequately characterize potential contaminant release to groundwater and from surface discharge renders that portion of DOE's EIS inadequate. DOE's discussion of these impacts in its EISs is not consistent with NRC's regulations for completeness and adequacy of the discussion of environmental consequences of the proposed action."

Furthermore, the letter stated that "given the importance of groundwater as a natural resource in the arid Yucca Mountain region, we concluded that supplementation is needed to ensure the 2002 EIS and the Repository Supplemental EIS are adequate. The NRC staff's review and findings about the adequacy of DOE's EIS are documented in a September 5, 2008 report. The DOE did not comply with 10 CFR § 63 (a) which stated:

*"Information provided to the Commission by an applicant for a license or by a licensee, or information required by statute, or required by the Commission's regulations, orders, or license conditions to be maintained by the applicant or the licensee must be **complete and accurate in all material respects.**"*

And (b) which stated:

*"The applicant or licensee shall notify the Commission of information identified by the applicant or licensee as having, for the regulated activity, a significant implication for public health and safety or common defense and security. An applicant or licensee violates this paragraph only **if the applicant or licensee fails to notify the Commission of information that the applicant or licensee has identified as having a significant implication for public health and safety or common defense and security. Notification must be provided to the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, within 2 working days** of identifying the information. This requirement is not applicable to information that is already required to be provided to the Commission by other reporting or updating requirements."*

In conclusion, it appears that the previous administration did not provide a Supplement Environmental Impact Statement as a part of the License Application as was required by the Nuclear Regulatory Commission.

I respectfully suggest that your administration use this information to address the US Court of Appeals District of Columbia in this matter. Should you have any questions please feel free to communicate with me by E-mail at drjacobP1@yahoo.com or by phone at 702-326-5857.

Sincerely yours,

Dr. Jacob D. Paz

Cc: Secretary, Department of Energy
State of Nevada Agency for Nuclear Project
Nevada Congressional Delegation
NRC

March 30, 2009

Dr. Jacob D. Paz
402 Greenbrier Street #47
Deridder, LA 70634

Dear Dr. Paz:

I am responding to your letter of March 7, 2009, to Mr. Lawrence Kokajko, of the U.S. Nuclear Regulatory Commission's (NRC's) Division of High-Level Waste Repository Safety. You identify recent information about the observed induction of genomic instability in cells as a result of the combined exposure to metal ions and radiation. You ask that the NRC staff review this information as you believe it may have a major impact on NRC's review of an application to construct a repository at Yucca Mountain, Nevada. You also ask why the Environmental Impact Statements (EISs) prepared by the U.S. Department of Energy (DOE) did not fully discuss the potential for impacts arising from the release of heavy metals from the corrosion of waste canisters and how NRC will address this omission.

As you know, NRC received an application from DOE, on June 3, 2008, for a license to construct and operate a repository for high-level nuclear waste at Yucca Mountain. NRC's safety determination and licensing decision will be based on an evaluation of the information provided in the application as well as that considered during a formal adjudicatory (trial-type) proceeding. As a part of this process NRC must determine whether DOE's proposal meets all applicable NRC requirements. These requirements do not address the specific synergistic effects which are the subject of your concern.

As was noted in a December 12, 2003, letter to you, NRC does not have the statutory authority to regulate chemical hazards or the combined health effects from radiation and chemical hazards associated with facilities it regulates. The U.S. Congress gave authority for establishing public health, safety and environmental standards for the proposed repository at Yucca Mountain to the U.S. Environmental Protection Agency (EPA). On September 30, 2008, the EPA published final public health and environmental radiation protections standards for Yucca Mountain. Consistent with the Energy Policy Act of 1992, these are the only public health and safety standards that apply to the Yucca Mountain site. After careful consideration, and review of extensive public comments, NRC incorporated EPA's final standards into our final Part 63 regulations for Yucca Mountain on March 13, 2009, as required by the Nuclear Waste Policy Act.

With regard to your concern about DOE's EISs, the NRC staff agrees that DOE's analysis did not provide an adequate discussion of the cumulative amounts of radiological and non-radiological contaminants that may enter groundwater over time, and how these contaminants would behave in the aquifer and related environment. We found that this failure to adequately characterize potential contaminant release to groundwater and from surface discharge renders that portion of DOE's EIS inadequate. DOE's discussion of these impacts in its EISs is not consistent with NRC's regulations for completeness and adequacy of the discussion of environmental consequences of the proposed action.

Given the importance of groundwater as a natural resource in the arid Yucca Mountain region, we concluded that supplementation is needed to ensure the 2002 EIS and the Repository Supplemental EIS are adequate. The NRC staff's review and findings about the adequacy of DOE's EIS are documented in a September 5, 2008 report, "U.S. Nuclear Regulatory Commission Staff's Adoption Determination Report for the U.S. Department of Energy's Environmental Impact Statements for the Proposed Geologic Repository at Yucca Mountain." This report is available on NRC's website at: <http://www.nrc.gov/waste/hlw-disposal/yucca-lic-app/nrc-eis-adr.pdf>. On September 8, 2008, the Director of NRC's Office of Nuclear Material Safety and Safeguards, Mr. Michael Weber, informed DOE that additional supplementation is needed to ensure the 2002 FEIS and the 2008 Repository Supplemental EIS are adequate (available at: <http://www.nrc.gov/waste/hlw-disposal/letter-to-doe.pdf>). On October 3, 2008, DOE replied, stating that it will provide the needed supplement no later than fall of 2009 (available at: http://adamswebsearch2.nrc.gov/nrcws/nrcdoccontent.aspx?Library=PU_ADAMS^PBNTAD01&LogonID=9619198fec9c35737a25a29bdd5a6343&DocID=082820281).

I trust that this information is useful to you. We appreciate your interest in NRC's regulatory program for the proposed repository at Yucca Mountain.

Sincerely,

/RA/

Janet P. Kotra, Ph.D
Senior Project Manager
Division of High-Level Waste Repository Safety
Office of Nuclear Material Safety
and Safeguards

Dr. Jacob Paz
5440 Count Carlson Cir
Las Vegas, NV 89119

White Paper On Erionite Exposure of Employees and Visitors at Yucca Mountain

On November 22, 2011, the National Institute of Occupational Safety and Health NIOSH Science Blog <http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/> published an article entitled "Erionite: An Emerging Health Hazard" By David Weissman, MD, and Max Kiefer, MS, CIH. The article discusses the carcinogenicity, and occurrence of erionite in North America, and steps to reduce potential exposure to this health hazard. Until recently, erionite was not commonly considered a potential health hazard in North America, in part because a relatively minute risk for exposure was observed. However, erionite related disease has been reported in North American of workers engaged in road construction, road maintenance, and gravel work. Sources of possible erionite-related disease have been detected in the States of California, Oregon, Utah, and North Dakota, as well as at the Yucca Mountain site in large quintiles up to 35% in some location.

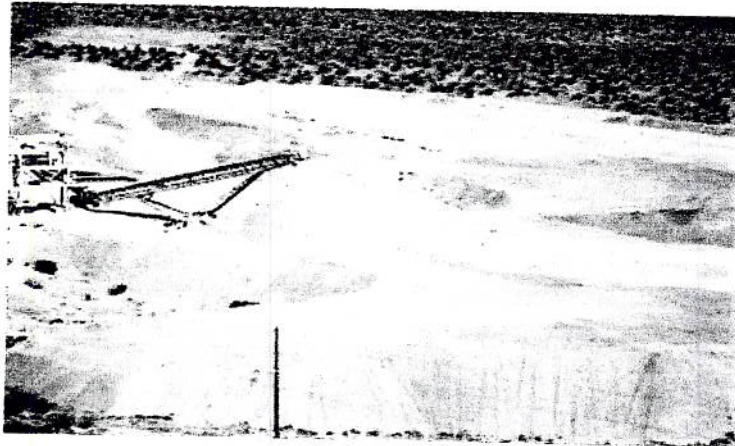
In March 16, 2004, a Congressional hearing in Las Vegas, NV chaired by Senator Reid heard complaints and testimony of Yucca Mountain employees who have been exposed to toxic dust in exploratory tunnel excavations. Employees stated that they were not provided with proper respirators and personal protective equipment to protect themselves against harmful toxic fibers such as silica and erionite. In spite of these warning on the potential/probable health hazards of exposure to erionite and silica, the Department of Energy and its contractors did not take the proper steps to remediate such health hazards. It took a prolonged amount of time to address this issue, and to develop appropriate health and safety procedures, in response to employee complaints. The Department of Energy ignored the fact that erionite is a potent carcinogen and their health safety precautions fell short. Looking back, a reasonable approach should have been based upon existing very strict OSHA regulations established for working with asbestos, See 29 CFR 1910.1001 and OSHA Act 1970, the general duty clause 5(a)(1) which stated the following: *"Each employer (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;"*

The NIOSH Blog mentioned above made specific recommendations to reduce the potential exposure to erionite and possible health risk. Below are highlighted some of the recommendations that the Department of Energy has not totally implemented into the Supplement Environmental Impact Statement of 2008:

- **Using wet methods to reduce dust generation for road and other work site such as in quarries where erionite is present (e.g., when drilling rock, apply water through the drill stem to reduce airborne dust, or use a drill with a dust collection system)**
- **Establishing decontamination protocols including changing of clothing, showering before leaving the worksite, and appropriate cleaning/disposal of personal protective equipment.**

Please note the area where tunnel waste dump is still ungraded and no posting of health hazard could pose a very serious health hazard to workers and visitors (**including Congress members**). The DOE technically is not in compliance with EPA guidelines "procedures for the proper disposal of waste and debris that contains erionite."

Figure 1 illustrate dumping of waste at YMP ground contaminated with erionite.



Following the hearing the DOE conducted medical surveillance and offered 1200 employees who were potentially exposed to silica and/or erionite to undergo X-ray evaluation. Recently, a published report by Cox (2010) working with the "The National Lung Screening Trial Research Team," conducted comprehensive medical testing on 53,454 persons at high risk for lung cancer. Participants were randomly assigned to undergo three annual screenings with either low-dose CT 26,722 participants or single-view posteroanterior chest radiography 26,732 patients. The medical test results reported that the rate of positive screening tests was 24.2% low-dose CT and compared with 6.9% with radiography.

It is extremely important to have a follow up study of Yucca Mountain employees to undergo low-dose CT, study. Such a study would improve detection rates and efforts to reduce mortality through the use of continuous screening.

We hereby request that Senator Reid and Congresswoman Shelley Berkeley fund this proposed a pilot study to save lives.

Yours,

Dr. Jacob D Paz

Cc//

Congresswoman Shelley Berkley,

State of Nevada Agency for Nuclear Projects

References

1. Cox. H.C, (2011). Better Evidence about Screening for Lung Cancer. *New England Journal of Medicine*. 365:455-457.
2. CDC-NIOSH Erionite: An Emerging Health Hazard By David Weissman, MD, and Max Kiefer. blogs.cdc.gov/niosh-science-blog/2011/11/erionite/

It is extremely important to have a follow up study of Yucca Mountain employees to undergo low-dose CT, study. Such a study would improve detection rates and efforts to reduce mortality through the use of continuous screening. **I hereby request that Nevada Congressional Delegation seek funding for a pilot study of Yucca Mountain workers in order to save lives. I am collaborating with the Department of Health Science at UNLV to investigate this potent health hazard.**

The Yucca Mountain License Application fails properly to protect employees and visitors and therefore it is incomplete, since it did not comply with OSHA Act (5)(a)(1) and 10 CFR 63 (a) & (b), and a recent EPA guidelines for disposal of erionite fibers.

Yours Truly,

Dr. Jacob D Paz
Cc// President Obama
Secretary of Energy Mr. Chu
NV Congressional Delegation
The NRC

References

1. Cox, H.C, (2011). Better Evidence about Screening for Lung Cancer. *New England Journal of Medicine*. 365:455-457.
2. CDC-NIOSH Erionite: An Emerging Health Hazard By David Weissman, MD, and Max Kiefer. blogs.cdc.gov/niosh-science-blog/2011/11/erionite/



NIOSH Science Blog

Safer Healthier Workers

Erionite: An Emerging North American Hazard (<http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/>)

Categories: [Respiratory hazards](http://blogs.cdc.gov/niosh-science-blog/category/respiratory-health/) (<http://blogs.cdc.gov/niosh-science-blog/category/respiratory-health/>), [Silica/Silicosis](http://blogs.cdc.gov/niosh-science-blog/category/silicasilicosis/) (<http://blogs.cdc.gov/niosh-science-blog/category/silicasilicosis/>)

November 22nd, 2011 8:50 am ET - **David Weissman, MD, and Max Kiefer, MS, CIH**

Erionite is a naturally occurring mineral that belongs to a group of silicate minerals called zeolites. It is usually found in volcanic ash that has been altered by weathering and ground water. Like naturally occurring asbestos, deposits are present in many Western states (see map).¹ Erionite can occur in a fibrous form. Disturbance of this material can generate airborne fibers with physical properties and health effects similar to asbestos. For example, it has long been known that residents of some Turkish villages where erionite-containing rock was used to construct homes have a remarkably high risk for development of malignant mesothelioma.²



(<http://blogs.cdc.gov/niosh-science-blog/?p=886>)

Occurrences of erionite in sedimentary rocks of the western US. From Sheppard (USGS), 1996. Click the image for a list of the identified locations.

Until recently, erionite was not generally considered to be a potential hazard in North America, in part because relatively little risk for exposure was seen. However, evidence has slowly accumulated linking exposure to erionite with serious adverse health effects in North America, and suggesting that some workers may have a greater potential for exposure than previously

recognized. The first North American with erionite-related lung disease was recognized in Utah and reported in 1981.³ He was a road construction worker who lived in an area rich in zeolite deposits. He had extensive parenchymal and pleural fibrosis and had a lung biopsy revealing the presence of both fibrous and nonfibrous particles which had compositions determined by energy-dispersive X-ray analysis to be consistent with erionite. In 2008, a mesothelioma cluster was described in the vicinity of a small village in a zeolite-rich region of central Mexico.⁴ The same year, 2 additional cases were reported from a neighboring Mexican state.⁵ One of them underwent lung biopsy and examination of tissue showed a high burden of erionite. In 2009, a mesothelioma case associated with pulmonary interstitial fibrosis, pleural plaque formation and substantial lung burden of erionite was documented in a man who had lived in Mexico and the United States.⁶ In 2011, the results of a study conducted in southwestern North Dakota were reported.⁷ The study was motivated by the realization that, since the 1980s, gravel pits had been excavated in areas containing erionite deposits and the gravel used to surface local roads and other areas. Ambient and activity-based sampling was performed and demonstrated the potential for airborne fiber exposures. Individuals with potentially high exposures were identified and underwent careful clinical evaluation. Two with histories of road maintenance work (one had also worked in a local gravel pit) were found with mild bilateral localized pleural changes with calcification and minimal unilateral and bilateral lower lobe interstitial changes that could only be seen by CT scan. Other than erionite, neither reported potentially causative exposures.

There are no regulatory or consensus standards or occupational exposure limits (OEL) for airborne erionite fibers. Development of a quantitative OEL awaits development of a standardized, validated exposure assessment method and quantitative evaluation of risks associated with given exposures. Still, The National Toxicology Program has designated erionite to be a known human carcinogen and a study by the U.S. Geological Survey found that erionite fibers from the Cappadocian region of Turkey, North Dakota, and Oregon were chemically and morphologically similar.^{8,9} Little is known about exposures currently experienced by US workers. However, erionite-related disease has most often been reported in road construction and maintenance workers with potential occupational exposures to erionite-containing gravel used in road surfacing. Also, one case had worked in an erionite-containing gravel pit (but had also been a road worker). Although it is reasonable to be concerned, erionite-related clinical disease has not yet been reported in other US workers engaged in activities that might crush erionite-containing rock or stir up dust in soils/gravel that contain erionite.

Erionite fibers only pose a hazard if they are disturbed and become airborne, and control recommendations should focus on reducing the potential for exposure to airborne erionite fibers. Activity-based breathing zone air sampling has confirmed that when gravels containing erionite are disturbed, erionite fibers can become airborne.¹⁰ Intensity of these exposures may vary due to a number of factors, including the weather conditions (damp vs. dry, windy vs. calm), the intensity with which erionite-containing materials are disturbed and the concentration of erionite in the gravels being disturbed. However, bulk gravel erionite concentrations alone are not a reliable predictor of air concentrations, as disturbance of gravels containing erionite in "trace" amounts (< 0.2%) can sometimes result in relatively high airborne fiber concentrations.

These data support the need to implement precautions to protect workers by limiting the generation and inhalation of dust known or thought to be contaminated with erionite. A

reasonable approach based on current information would be to take precautions such as those described in existing guidance for working with asbestos (Occupational Safety and Health Administration [OSHA] 29 CFR 1910.1001). Existing recommendations for working in areas with naturally occurring asbestos may be particularly relevant to reducing outdoor occupational erionite exposures.¹¹

Risk reduction recommendations to limit erionite exposures of workers who engage in activities that disturb erionite-containing gravel/soil or crush rocks that contain erionite can include:

- Training workers about the potential hazards of erionite and control methods for reducing the potential for exposure
- Knowing where erionite containing material is present and will be encountered prior to beginning any work
- Avoiding the use of erionite containing aggregate whenever possible
- Using wet methods to reduce dust generation for road and other work such as in quarries where erionite is present (e.g., when drilling rock, apply water through the drill stem to reduce airborne dust, or use a drill with a dust collection system)
- Limiting the number of workers who will be engaged in work with erionite
- Establishing decontamination protocols including change of clothing, showering before leaving the worksite, and appropriate cleaning/disposal of personal protective equipment
- Ensuring work clothing is not washed at home to prevent erionite fibers from being brought home on work clothes and boots
- Prohibiting dry sweeping, the use of leaf blowers, or the use of compressed air for cleaning
- Protecting employees with personal protective equipment, including respiratory protection. Note: An occupational safety and health professional should be consulted for specific guidance about the most appropriate personal protective equipment that should be used for the work being conducted.
- Prohibiting eating, drinking, or smoking in dusty work areas where erionite fibers may be airborne. Workers should move away from the work area for breaks and wash their hands and face before eating, drinking, or smoking.
- Establishing protocols for vehicle use on erionite containing roads (drive slowly, vents closed, windows up)
- Wet washing equipment and vehicle exteriors, and wet cleaning/High Efficiency Particulate Air (HEPA) filter vacuuming of vehicle interiors.
- Following Environmental Protection Agency (EPA) procedures for proper dispose of waste and debris that contains erionite.
- Limiting bystander exposure by preventing visitors and coworkers from standing in work areas where erionite fibers may become airborne.


Although much remains to be learned about erionite in the US, airborne occupational erionite fiber exposures should be considered at least as hazardous as asbestos fiber exposures and similar preventive measures used. We look forward to working with our scientific colleagues to stay informed about further occupational health data relating to erionite as more studies become available, and we invite you to consider what scientific and technical questions you would have about this emerging occupational health issue.

Dr. Weissman is Director of the NIOSH Division of Respiratory Disease Studies.

Mr. Kiefer is Director of the NIOSH Western States Office.

Works Cited

1. Sheppard R. Occurrences of erionite in sedimentary rocks of the western United States. Denver, CO: US Department of the Interior, US Geological Survey; 1996. Open File Report 96-018.
2. Carbone M, Baris I, Bertino P, Brass B, Corertpay S, Dogan A, Gaudino G, Jube S, Kanodia S, Partridge C, Pass H, Rivera Z, Steele I, Tuncer M, Way S, Yang H, Miller A (2011). Erionite exposure in North Dakota and Turkish villages with mesothelioma. *Proc Natl Acad Sci U S A* 108(33):13618-13623.
3. Rom W, Casey K, Parry W, Mjaatvedt C, Moatamed F (1983). Health implications of natural fibrous zeolites in the intermountain west. *Environ Res* 30:1-8.
4. Ilgren EB, Ortega Brena M, Castro Larragoitia J, et al. A reconnaissance study of a potential emerging Mexican mesothelioma epidemic due to fibrous zeolite exposure. *Indoor Built Environ*. 2008;17:496-515.
5. Ilgren EB, Pooley FD, Larragoitia JC, et al. First confirmed erionite related mesothelioma in North America. *Indoor Built Environ*. 2008;17:567-568.
6. Kliment CR, Clemens K, Oury TD. North american erionite-associated mesothelioma with pleural plaques and pulmonary fibrosis: a case report. *Int J Clin Exp Pathol*. 2009;2(4):407-10. Epub 2008 Nov 25.
7. Ryan P, Dihle M, Griffin S, Partridge C, Hilbert T, Taylor R, Adjei S, Lockey J (2011). Erionite in road gravel associated with interstitial and pleural changes - an occupational hazard in Western United States. *J. Occup Environ Med* 53(8): 892-898.
8. NTP-NIEHS. Report on carcinogens, twelfth edition (2011). Erionite. CAS No. 66733-21-9. [<http://ntp.niehs.nih.gov/ntp/roc/twelfth/profiles/Erionite.pdf>, accessed 11/4/11].
9. USGS (2010). Chemical and morphological comparison of erionite from Oregon, North Dakota, and Turkey. Prepared for the U.S. Environmental Protection Agency, Region 8. U.S. Department of the Interior, U.S. Geological Survey. Open-File Report 2010-1286.
10. EPA (2007) Analytical results report; Dunn County erionite, Killdeer, Dunn County, North Dakota. United States Environmental Protection Agency, Contract No. EP-W-05-050
11. ATSDR-CDC. Asbestos: for workers involved in activities that disturb soil or generate dust in areas with naturally occurring asbestos. [<http://www.atsdr.cdc.gov/noa/docs/Asbestos-workers.pdf>, accessed 10/22/2011].

 [22 Comments \(#comments\)](#) - [Post a Comment \(#postcomment\)](#)

Public Comments

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1. November 22, 2011 at 10:31 am ET - Michael

For the benefit of blog readers, please provide full citations for the 11 references cited.

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2051\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2051)

- o AUTHOR COMMENT November 22, 2011 at 12:12 pm ET - David Weissman and Max Kiefer

Thank you for contacting us. The full citations are available by clicking on "Works

Cited” under our signature lines. To make this clearer to readers we have changed the link to read “Click for Works Cited.”

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2073\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2073)

2. November 22, 2011 at 12:11 pm ET - Patrick

Any way to get a listing of the sites referenced on the map or did I miss a hyperlink somewhere?

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2052\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2052)

- o AUTHOR COMMENT November 22, 2011 at 3:03 pm ET - David Weissman and Max Kiefer

Thank you for you suggestion. The location of all sites listed on the map can now be found by clicking on the map (<http://blogs.cdc.gov/niosh-science-blog/?p=886>) . Specific locations for these sites are also available in reference #1.

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2072\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2072)

3. November 22, 2011 at 4:59 pm ET - Frank Ehrenfeld

I’m working with a newly charged ASTM D22.07 committee to develop analytical methods for erionite testing. I’ll be in Yellowstone (51 on your map) in August 2012. Anyone I can contact about getting some samples to test by our group? Thanks.

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2053\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2053)

- o AUTHOR COMMENT November 23, 2011 at 9:17 am ET - David Weissman and Max Kiefer

Thank you for your comment. We will contact you directly to discuss.

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2071\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2071)

4. November 22, 2011 at 5:02 pm ET - Stuart

Would you be able to post these sites on Google Earth so we can get a better idea of where they are located and what to avoid?

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2054\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2054)

- o AUTHOR COMMENT November 23, 2011 at 2:51 pm ET - David Weissman and Max Kiefer

Our intent was not to encourage people to avoid these areas, but to provide information about the US distribution of naturally occurring erionite deposits as reported by the USGS in 1996 so that employers and workers would be aware of the possibility of a potential for job-related exposure similar to that reported in North Dakota, where gravel used to surface roads came from a pit containing erionite. Those concerned about the possibility of occupational exposure to airborne fibers of such materials should consult with an expert familiar with the geology of their area and knowledgeable about the presence of erionite containing quarry pits.

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2070\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2070)

5. November 22, 2011 at 9:43 pm ET - Andrew Robbins

No mineral is safe for you/us to inhale! Not one.

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2055\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2055)

6. November 23, 2011 at 1:52 pm ET - Dr. Jacob D Paz

Yucca Mountain Project the proposed high nuclear repository (YMP) and Erionite In 2004, DOE employees at Yucca Mountain Project YMP complained of exposure to high levels of silica and erionite, a potent carcinogen, erionite were located in various veins at YMP This complain resulatt in a Congressional Hearing in Las Vegas, NV March 16, 2004. About 1200 employees or more were exposed were exposed to eironite they and had X-ray evaluation, but no CT or MRI were taken of these workers what is the medical outcome is unknown.

Figure 1. Congressional Hearing on Exposure to Silica and Erionite dust at YMP (Las Vegas Review Journal March 16, 2004)

There are additional health and safety concerns. During tunneling operations at Yucca Mountain Project the proposed high nuclear repository located 100 mile north of Las Vegas NV. YMP, waste contaminated with erionite was dumped onto the open ground and pose health risks for visitors, employees and the environment. The further use of tunnel boring machines and conveyor belts during tunneling operations would or had increased erionite air contaminant exposure spread within the tunnel. In the Environmental Impact Statement 2008 recommended use of use of "administrative control" to minimize exposure to erionite this method is impractical and is not used in asbestos abatement. Asbestos removal must use personal protection equipment (PPE) that includes respirators and protective clothing. Negative room pressure, and separate room for PPE change is used to prevent releases of asbestos contamination of employees and the releasing asbestos into the environment. The health and Safety precaution in the EISs are inadequate and posed health risk to workers and visitors.

Figure 2. OSHA Asbestos Disposal

Figure 3. Erionite Disposal At YMP site

Methods (OSHA.gov) (LV Review The EPA and OSHA have very stringent regulations for asbestos disposal, such as double bagging. Currently, there are no EPA or OSHA regulations for handling, disposal, and health and safety precautions for erionite, the only OSHA regulation applicable is 5 (a)(1).)

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2056\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2056)

7. November 24, 2011 at 8:29 am ET - M Geyer

Given the map and sites listed as "occurrences of erionite," I notice that many of these "sites" are identified as: drill holes. Please explain.

Are these "sites" actually locations where core samples were collected from borings? If so, just what is the hazard? If this material is not surficial or near surface...so what! I've identified galena, arsinatite, tremolite, chrysotile, and cinibar, to name a few "hazardous" minerals, in core samples at drill sites. Given that these mineral were not surficial, there is no risk of inhalation.

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2057\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2057)

- AUTHOR COMMENT November 23, 2011 at 2:51 pm ET - David Weissman and Max Kiefer

Thank you for your comment; our intent was not to make a hazard determination but provide information about the US distribution of naturally occurring erionite deposits as reported by the USGS in 1996 so that employers and workers would be aware of the possibility of a potential for job-related exposure similar to that reported in North Dakota, where gravel used to surface roads came from a pit containing erionite. You are correct, erionite fibers only pose a hazard if they are disturbed, become airborne, and present a risk of inhalation.

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2069\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2069)

8. November 27, 2011 at 7:03 am ET - Michel H Nazaire

Thank you for the data concerning erionite and its potentially causative exposures: the ideal objective is to preclude occupational exposure detrimental to the health ... People working in healthful and comfortable environment are more productive...

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2058\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2058)

9. November 28, 2011 at 9:17 am ET - Chris

Hundreds of thousands of tons of sand are being transported to the Eastern United States from the identified region for "fracking" of natural gas wells. The sand is then transloaded to trucks at various rail sidings with considerable sand dust being created. This sand is then transported to drilling site sand hogs for use in the drilling process. Considering the properties described above and the purpose of using this sand it seems possible. Do you have knowledge of these sands being derived from these erionite deposits?

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2059\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2059)

- AUTHOR COMMENT December 1, 2011 at 6:37 pm ET - David Weissman and Max Kiefer

Thank you for your question and for raising this as a potential occupational health issue. If sands are being derived from volcanic ashes in erionite-rich regions, it is possible that erionite could be present in some of these materials. However, currently available information does not allow us to determine if this is, or is not, the case. It has been documented that silica is present in fracking material. For more information on silicosis see the recent blog [The Continuing Persistence of Silicosis](http://blogs.cdc.gov/niosh-science-blog/?p=543) (<http://blogs.cdc.gov/niosh-science-blog/?p=543>).

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2068\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2068)

10. December 2, 2011 at 6:44 pm ET - Genevieve

we at Mesothelioma Lawsuits also discuss this threats in great details. its really alarming to have this kinds of hazards in our environment today and so we should act now or never.

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2060\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2060)

11. January 19, 2012 at 12:37 pm ET - Kathie Marsaglia

My guess is that Site 14 near Shoshone refers to erionite in altered tuffs in the Tecopa lake beds, a place visited by thousands of geologists over the years. Should I reconsider taking my students out to examine these units? Unfortunately, I have distinct “dusty” memories of camping in the wash there on a few windy nights. It would be great to have some idea of the relative dangers associated with each of your numbered localities.

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2103\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2103)

- AUTHOR COMMENT January 23, 2012 at 1:34 pm ET - David Weissman and Max Kiefer

Thank you for your question. To answer it, we would need to have risk assessment information similar to that performed by EPA to assess environmental risks associated with naturally occurring asbestos deposits in California's Clear Creek Management Area (see <http://www.epa.gov/region9/toxic/noa/clearcreek/index.html> (<http://www.epa.gov/region9/toxic/noa/clearcreek/index.html>) <http://www.cdc.gov/Other/disclaimer.html>). We do not have similar risk assessment information about sites where erionite was found in rock samples in the 1996 USGS report (Sheppard 1996). Also, we do not have similar measurements of airborne erionite fiber exposures or knowledge of the potential for airborne erionite fiber exposures at these sites. Given that, it is not possible to estimate what, if any, transient exposure could occur from camping in the identified areas. As we discuss in the blog, the reported cases of erionite-related disease have thus far been in those with risks for high levels of exposure, such as those using contaminated gravel for road work or excavating such gravel from contaminated pits.

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2125\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2125)

12. January 26, 2012 at 6:54 pm ET - Beth Nichols Boyd

The following caption accompanies a map (and article) in the February, 2012 issue of EARTH magazine:

“Map of occurrences of erionite in sedimentary rocks of the western United States. Since the map was produced in 1996, erionite deposits have also been found in Washington. A full listing of the locations identified here can be found at [www.cdc.gov/niosh/blog/nsb112211_erionite-map.html].”

This url was no longer correct but linked to the page where this comment box is located.

My question? I don't see where to access the full listing of the locations shown in the map. Instructions, please.

Thank you.

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2131\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2131)

- AUTHOR COMMENT January 27, 2012 at 10:06 am ET - Administrator

Thank you for bringing this to our attention. The map can now be found here: <http://blogs.cdc.gov/niosh-science-blog/2011/11/map-erionite/> (<http://blogs.cdc.gov/niosh-science-blog/2011/11/map-erionite/>)

We have added a redirector to the URL to fix the 404 error you encountered.

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2135\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2135)

13. February 6, 2012 at 3:14 pm ET - Berthin Hyde

The USGS study references sedimentary rock-containing zeolites in their study. Zeolites commonly are secondary minerals in volcanic rocks. Volcanic rocks are commonly used as roadbed and are ground up and applied as "sand" to roads during icy conditions. Do you have information on:

- 1) studies that have sought to determine the Erionite (zeolite) presence/absence in volcanic rocks? Eastern Washington and other western states have a lot of vesicular basalt with zeolites used in roadbeds.
- 2) groundwater/drinking water studies that evaluate Erionite (zeolite) concentrations? There are many aquifers and surface waters that are within or come in contact with zeolites. and
- 3) whether Erionite could pose a health risk if ingested (ie to the digestive system by drinking) rather than the respiratory system?

Thanks,
Berthin Hyde

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2336\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2336)

- o AUTHOR COMMENT February 7, 2012 at 2:15 pm ET - David Weissman and Max Kiefer

Thank you for your excellent questions. Unfortunately, there is still much to learn. The 1996 USGS study referenced in the blog is the only currently-available national survey for presence of erionite that we are aware of. Also, we cannot provide information about levels in the US water supply or risks related specifically to ingestion into the GI tract. Clearly, more research is needed on this topic. We hope the blog has increased awareness of this issue and will help to encourage additional studies.

[Link to this comment \(http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2374\)](http://blogs.cdc.gov/niosh-science-blog/2011/11/erionite/#comment-2374)

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