Sinks, Tom (ATSDR/OA/OD)

From: Coleman.Sam@epamail.epa.gov
Sent: Wednesday, July 05, 2006 10:37 AM
To: Benken, Donald (CDC/CCEHIP/NCEH)
Cc: Sinks, Tom (ATSDR/OA/OD); Keim, Mark (CDC/CCEHIP/NCEH); R E. Greene; David Gray; L Starfield; S Coleman; Dana Tulis
Subject: Re: FEMA Conf. Call Number

I spoke to them on Monday. They continue to want to do some testing. I suggested that we have a followup conf call this week. Additionally, I strongly suggest that this is a policy decision. We need to brief the Agency leadership to assure that we are all together.
to ----------\Sent by EPA Wireless E-Mail Services.

----- Original Message -----
From: "Benken, Donald (CDC/CCEHIP/NCEH)" [dxb3@cdc.gov]
Sent: 07/05/2006 08:50 AM
To: Sam Coleman/R6/USEPA/US@EPA
Cc: "Sinks, Tom (ATSDR/OA/OD)" <ths2@cdc.gov>; "Keim, Mark (CDC/CCEHIP/NCEH)" <mjk9@cdc.gov>
Subject: RE: FEMA Conf. Call Number

Sam,

Have you heard anything else from FEMA regarding the issue that addresses interior air quality related to their trailers (formaldehyde)?

From the call, it was clear they have a specific interest in testing a random sample of the current trailers in New Orleans or at least those trailers that will come into the area from the manufacturers. Will they continue to seek assistance from the Consumer Protection Agency or the manufacturers?

Clearly, testing of the trailers is not in our jurisdiction, but I also don't want to be unresponsive to their request. After the lengthy conference call with FEMA, EPA, CDC, ATSDR, et.al. last week, and recommendations against testing, if they determine that it is still a viable mission assignment, we will be willing to review the protocol for testing to determine the best collection methods and determine if we can measure the benefit from a public health perspective.

If you happen to hear the direction they plan on going, please let me know.

Donald Benken, MPH, JD
Senior Public Health Advisor
Acting Deputy Director

Centers for Disease Control and Prevention National Center for Environmental Health and ATSDR Office of Terrorism Preparedness and Emergency Response

4770 Buford Highway, Mailstop F-29
Chamblee, Georgia 30341

770-488-7930 Office
770-488-7742 Fax
770-361-2601 Cell

dxb3@cdc.gov

----Original Message-----
From: Coleman.Sam@epamail.epa.gov [mailto:Coleman.Sam@epamail.epa.gov]
Sent: Wednesday, June 28, 2006 9:39 AM
To: Benken, Donald (CDC/CCEHIP/NCEH)
Subject: Fw: FEMA Conf. Call Number

U.S. Department of Homeland Security
500 C Street, SW
Washington, DC 20472

FEMA

November 30, 2006

Scott V. Wright
ATSDR
Mailstop F-29, Room 3217
4770 Buford Highway, NE
Atlanta, GA 30341-3717
(770) 488-3343

Re: FEMA Trailer Formaldehyde Testing

Dear Mr. Wright:

Enclosed you will find a DVD disk containing the test results and related data from the FEMA trailer formaldehyde testing conducted by EPA. Please review the data and provide to me a written report of your analysis of the results of these tests and any conclusions or recommendations that can be derived therefrom.

Please keep this information and your analysis confidential. No information should be released to any third party without my express permission. Please contact me directly if you have any questions at (202) 646-3825.

Sincerely,

Patrick Edward Preston, Trial Attorney
Office of Chief Counsel
(202) 646-3825
(202) 646-4536 *fax*

Enclosure

Frumkin, Howard (ATSDR/OA/OD)

From: Coleman.Sam@epamail.epa.gov
Sent: Friday, December 01, 2006 6:20 PM
To: Little, Joseph D. (ATSDR/DTEM/PRMSB); Wright, Scott V. (ATSDR/DTEM/PRMSB)
Cc: starfield.lawrence@epa.gov; coleman.sam@epa.gov; broyles.ragan@epa.gov; Rauscher.Jon@epamail.epa.gov; Dinan.Janine@epamail.epa.gov; Tulis.Dana@epamail.epa.gov; Crossland.Ronnie@epamail.epa.gov; Dunne, Tom; Frumkin, Howard (ATSDR/OA/OD)
Subject: Fw: Summary of bi-monthly formaldehyde conference call

Thanks for all of you work up to this point on this project. We at EPA are concerned that FEMA might not be properly interpreting the data. We urge CDC to complete its review as soon as possible to provide appropriate advice to FEMA. Should you need any assistance from EPA you can contact me, or Dana Tulis in HQ. Dana's number is 202.564.7938, or 202.253.8309.

Samuel Coleman, P.E.
Director, Superfund Division Region 6
214 665-6701
214 789-2016 (cell)
coleman.sam@epa.gov
----- Forwarded by Sam Coleman/R6/USEPA/US on 12/01/2006 05:09 PM -----

"Bryant, Madeline L" <lenell.bryant@associates.dhs.gov>
12/01/2006 04:31 PM

To "Hall, Betsy" <betsy.hall@dhs.gov>, "Alamia, Frank " <frank.alamia@dhs.gov>, "Andrews, Michael" <michael.andrews@dhs.gov>, "Bonomo, Guy" <Guy.Bonomo@dhs.gov>, "Boyle, Brian" <Brian.Boyle@dhs.gov>, "Burnette, Tina" <tina.burnette@dhs.gov>, "Collor, Corey " <corey.collor@dhs.gov>, "Chawaga, David J" <david.chawaga@dhs.gov>, "Smith, George" <george.smith3@dhs.gov>, "Haubrich, Gail" <gail.haubrich@dhs.gov>, "Igert, Jill" <jill.igert@dhs.gov>, "Stark, James W" <james.w.stark@dhs.gov>, "Souza, Kevin" <kevin.souza@dhs.gov>, "Miller, Stephen" <stephen.miller1@dhs.gov>, "McNeese, Martin"

<martin.mcneese@dhs.gov>, Gary Newhart/CI/USEPA/US@EPA, "Reams, Stephen" <stephen.m.reams@dhs.gov>, "Brown, Bronson" <bronson.brown@dhs.gov>, "Byrd, Jon" <Jon.Byrd@dhs.gov>, "Donley, Diane" <diane.donley@dhs.gov>, "Preston, Patrick" <pepreston@dhs.gov>, "Phillips, David" <david.phillips1@dhs.gov>, "Rodi, Rachel C" <rachel.rodi@dhs.gov>, "Simoneaux Jr, Louis J" <louis.simoneaux@dhs.gov>, "Sislen, Rita" <rita.sislen@dhs.gov>, "Hallstead, Carl" <carl.hallstead@dhs.gov>, jdl0@cdc.gov, svw3@cdc.gov, Dana Tulis/DC/USEPA/US@EPA, rauscher.jon@epa.com, Ronnie Crossland/R6/USEPA/US@EPA, Sam Coleman/R6/USEPA/US@EPA, stephen.mason@dhs.gov, "Tillery, Lori" <lori.tillery@dhs.gov>, "Haynes, Tracy" <Tracy.Haynes@dhs.gov>, edward.laundry@dhs.gov, "emily e." <williams@hud.gov>, "Thigpen, Tanya L" <tanya.thigpen@dhs.gov>, "Sherman, Ron" <ron.sherman@dhs.gov>

cc

Subject

Summary of bi-monthly formaldehyde conference call

During our brief conference call representatives from FEMA IA, FEMA Safety, EPA, CDC, MS TRO, OC and GCRO.

- Rick Preston of, FEMA OCC Headquarters, offered an update.

??????????? oThe raw data from the EPA was received on a data disk during Thanksgiving week, culminating the EPA's reporting process ??????????? oThe data was duplicated and forwarded to Scott Wright of the CDC ??????????? oAnticipate final analysis from the CDC on, or around, December 11, 2006

oReviewed the raw data, "in a very non-scientific manner".? It appeared overall, there were low levels of airborne contaminants of formaldehyde found in the ?samples collected and analyzed by the EPA. Ventilation is the primary method in which to reduce formaldehyde in the trailers.

oReiterated the fact, if the media or another government agency ask questions pertaining to formaldehyde, refer them to FEMA OCC

Our next bi-monthly conference all will be Thursday, December 14, 2006, 4PM (CST)

Lenell Bryant
DHOPS Special Projects/
DHOPS Demolition Lead
(504)762-2407 - desk
(703)399-0549 - cell

Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)

From: Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Sent: Monday, December 04, 2006 7:10 AM
To: Little, Joseph D. (ATSDR/DTEM/PRMSB); Wright, Scott V. (ATSDR/DTEM/PRMSB); Holler, James S. (Jim) (ATSDR/DTEM/PRMSB)
Subject: Re: Summary of bi-monthly formaldehyde conference call

Guys if you could get a one pager on the background of this for Dr Frumkin it would be most helpful. Since he made a direct request to you it is probably appropriate to respond directly. A cc would be apprecuated.

Mike

Sent from my BlackBerry Wireless Device

-----Original Message-----
From: Frumkin, Howard (ATSDR/OA/OD) <haf6@cdc.gov>
To: Little, Joseph D. (ATSDR/DTEM/PRMSB) <jdl0@cdc.gov>; Wright, Scott V. (ATSDR/DTEM/PRMSB) <svw3@cdc.gov>; Rodenbeck, Sven (ATSDR/DHAC/CAPEB) <svr1@cdc.gov>; Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH) <mia2@cdc.gov>
CC: Sinks, Tom (ATSDR/OA/OD) <ths2@cdc.gov>
Sent: Sat Dec 02 07:39:19 2006
Subject: RE: Summary of bi-monthly formaldehyde conference call

Joseph, Scott:
I didn't know that this was happening. Can you let me know who at our end is handling it?
Thanks.
Howie

Howard Frumkin, M.D., Dr.P.H., Director
National Center for Environmental Health / Agency for Toxic Substances and Disease Registry Centers for Disease Control and Prevention 1600 Clifton Road, MS E-28 Atlanta, GA 30333 Tel 404-498-0004 Fax 404-498-0083 E-mail hfrumkin@cdc.gov FedEx deliveries:
1825 Century Boulevard
Atlanta, GA 30345

-----Original Message-----
From: Coleman.Sam@epamail.epa.gov [mailto:Coleman.Sam@epamail.epa.gov]
Sent: Friday, December 01, 2006 6:20 PM
To: Little, Joseph D. (ATSDR/DTEM/PRMSB); Wright, Scott V. (ATSDR/DTEM/PRMSB)
Cc: starfield.lawrence@epa.gov; coleman.sam@epa.gov; broyles.ragan@epa.gov; Rauscher.Jon@epamail.epa.gov; Dinan.Janine@epamail.epa.gov; Tulis.Dana@epamail.epa.gov; Crossland.Ronnie@epamail.epa.gov; Dunne, Tom; Frumkin, Howard (ATSDR/OA/OD)
Subject: Fw: Summary of bi-monthly formaldehyde conference call

Thanks for all of you work up to this point on this project. We at EPA are concerned that FEMA might not be properly interpreting the data. We urge CDC to complete its review as soon as possible to provide appropriate advice to FEMA. Should you need any assistance from EPA you can contact me, or Dana Tulis in HQ. Dana's number is 202.564.7938, or 202.253.8309.

Samuel Coleman, P.E.
Director, Superfund Division Region 6
214 665-6701
214 789-2016 (cell)
coleman.sam@epa.gov
----- Forwarded by Sam Coleman/R6/USEPA/US on 12/01/2006 05:09 PM -----

Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)

From: Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Sent: Monday, December 04, 2006 2:51 PM
To: Little, Joseph D. (ATSDR/DTEM/PRMSB); Holler, James S. (Jim) (ATSDR/DTEM/PRMSB)
Subject: Re: Summary of bi-monthly formaldehyde conference call

Good writeup Joe. You were wise to include the reference to the weekly. I know they are a pain but they do document your involvement in the issue. Also appreciate the cc. We may have to answer some more questions at some point. Hopefully this will address the question at hand.

Mike

Sent from my BlackBerry Wireless Device

-----Original Message-----
From: Little, Joseph D. (ATSDR/DTEM/PRMSB) <jdl0@cdc.gov>
To: Frumkin, Howard (ATSDR/OA/OD) <haf6@cdc.gov>
CC: Sinks, Tom (ATSDR/OA/OD) <ths2@cdc.gov>; Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH) <mia2@cdc.gov>; Wright, Scott V. (ATSDR/DTEM/PRMSB) <svw3@cdc.gov>; Rodenbeck, Sven (ATSDR/DHAC/CAPEB) <svr1@cdc.gov>; Holler, James S. (Jim) (ATSDR/DTEM/PRMSB) <jsh2@cdc.gov>; Benken, Donald (CDC/CCEHIP/NCEH) <dxb3@cdc.gov>; Perlman, Gary D. <Perlman.Gary@epa.gov>; De Rosa, Christopher (Chris) (ATSDR/DTEM/OD) <cyd0@cdc.gov>; Ayers, David H. (ATSDR/DTEM/OD) <dha1@cdc.gov>
Sent: Mon Dec 04 14:14:12 2006
Subject: RE: Summary of bi-monthly formaldehyde conference call

Dr. Frumkin,

Scott Wright and myself are currently awaiting to receive sampling data from FEMA concerning formaldehyde in temporary housing unit examples, similar to those utilized by Hurricane Katrina displaced persons. Rick Preston from FEMA's Office of General Council (OGC), indicated last Thursday (Nov. 30) that he would send, by fedex, a CD with the data to us. As of this moment, the data has not been received, but is expected some time today (Dec. 4). We indicated to FEMA that once the data is received, we would be able to provide a quick turn-around evaluation, as is standard protocol for evaluation of EPA data by the Emergency Response Program within the Division of Toxicology and Environmental Medicine. A time-frame of approximately 10 days or less was discussed for our evaluation. FEMA will use ATSDR's evaluation to effect their policy decision. The ATSDR Emergency Response Team's activities involving this issue have been described in the program's weekly activity reports.

Background:
June 19, 2006:
First conference call to discuss FEMA's concern of formaldehyde in temporary housing units used by Hurricane Katrina displaced persons. Participants on the call included, Don Benken (NCEH Katrina lead), Scott Wright (ATSDR ER), Joseph Little (ATSDR ER), Gary Perlman (ATSDR DRO), Sam Coleman (EPA 6), Rick Preston (FEMA OGC), and other FEMA, EPA, and ATSDR representatives. Concerns by FEMA about this issue are due to a pending lawsuit against FEMA concerning formaldehyde exposure from temporary housing units.

July 10, 2006:
Joseph Little (ATSDR ER) and Gary Perlman (ATSDR DRO) met with Sam Coleman (EPA 6) and Dana Tulis (EPA HQ) to discuss the formaldehyde issue while at the EPA On-Scene Coordinator (OSC) Training in Los Angeles, CA.

July 13, 2006:
conference call was conducted from the EPA OSC Training in Los Angeles. Participants on the call included Joseph Little (ATSDR ER), Gary Perlman (ATSDR DRO), Don Benken (NCEH), Ronnie Crossland (EPA 6), Sam Coleman (EPA 6), Dana Tulis (EPA HQ), Rick Preston (FEMA OGC), and other FEMA and EPA staff. Numerous concerns were expressed by ATSDR and EPA to FEMA regarding the difficulties associated with sampling for formaldehyde and interpreting

the data, due to the large number of other formaldehyde sources from other products in the home and individual lifestyle. The sampling project went forward at FEMA's request.

By-monthly conference calls have been conducted concerning the status of the sampling project. A total of 96 trailers (unoccupied from various manufacturers used by FEMA) were sampled. A sampling plan was provided by EPA, and ATSDR ER had the opportunity to review the plan. The sampling was completed over the Columbus Day weekend (Oct. 9). EPA provided their data report to FEMA in November and requested that FEMA provide the data directly to ATSDR/CDC for FEMA's requested evaluation.

If you have additional question please contact myself at 770-488-3339 or Scott Wright at 770-488 3343.

Joseph D. Little, MSPH
CDR US Public Health Service
Emergency Response Coordinator
Agency for Toxic Substances and Disease Registry
(770) 488-3339
(770) 488-7100 24-Hour

-----Original Message-----
From: Frumkin, Howard (ATSDR/OA/OD)
Sent: Saturday, December 02, 2006 7:39 AM
To: Little, Joseph D. (ATSDR/DTEM/PRMSB); Wright, Scott V. (ATSDR/DTEM/PRMSB); Rodenbeck, Sven (ATSDR/DHAC/CAPEB); Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Cc: Sinks, Tom (ATSDR/OA/OD)
Subject: RE: Summary of bi-monthly formaldehyde conference call

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I didn't know that this was happening. Can you let me know who at our end is handling it?
Thanks.
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Howard Frumkin, M.D., Dr.P.H., Director
National Center for Environmental Health / Agency for Toxic Substances and Disease Registry Centers for Disease Control and Prevention 1600 Clifton Road, MS E-28 Atlanta, GA 30333 Tel 404-498-0004 Fax 404-498-0083 E-mail hfrumkin@cdc.gov FedEx deliveries:
1825 Century Boulevard
Atlanta, GA 30345

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Samuel Coleman, P.E.
irector, Superfund Division Region 6
214 665-6701
214 789-2016 (cell)
coleman.sam@epa.gov
----- Forwarded by Sam Coleman/R6/USEPA/US on 12/01/2006 05:09 PM -----

From: Frumkin, Howard (ATSDR/OA/OD)
Sent: Tuesday, December 05, 2006 11:19 PM
To: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Cc: Sinks, Tom (ATSDR/OA/OD)
Subject: FW: Summary of bi-monthly formaldehyde conference call

Chris:
This came up on my radar screen recently, and I had to ask Joseph for an explanation since I hadn't heard anything about it. For activities that reach across to other agencies, and/or that are liable to involve any controversy, it really helps me to be kept up to date. Our weekly Senior Staff meetings are designed for these sorts of exchanges. Will that work for you?
Howie

Howard Frumkin, M.D., Dr.P.H., Director
National Center for Environmental Health / Agency for Toxic Substances and Disease Registry Centers for Disease Control and Prevention 1600 Clifton Road, MS E-28 Atlanta, GA 30333 Tel 404-498-0004 Fax 404-498-0083 E-mail hfrumkin@cdc.gov FedEx deliveries:
1825 Century Boulevard
Atlanta, GA 30345

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From: Little, Joseph D. (ATSDR/DTEM/PRMSB)
Sent: Monday, December 04, 2006 2:14 PM
To: Frumkin, Howard (ATSDR/OA/OD)
Cc: Sinks, Tom (ATSDR/OA/OD); Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH); Wright, Scott V. (ATSDR/DTEM/PRMSB); Rodenbeck, Sven (ATSDR/DHAC/CAPEB); Holler, James S. (Jim) (ATSDR/DTEM/PRMSB); Benken, Donald (CDC/CCEHIP/NCEH); Perlman, Gary D.; De Rosa, Christopher (Chris) (ATSDR/DTEM/OD); Ayers, David H. (ATSDR/DTEM/OD)
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Nickle, Richard (ATSDR/DTEM/PRMSB)

From: Wright, Scott V. (ATSDR/DTEM/PRMSB)
Sent: Thursday, December 07, 2006 10:29 AM
To: Nickle, Richard (ATSDR/DTEM/PRMSB); Zarus, Gregory M. (ATSDR/DHAC/EISAB)
Cc: Florence, John (ATSDR/OC); Little, Joseph D. (ATSDR/DTEM/PRMSB)
Subject: RE: FEMA Trailers

To all,

We are under a Gag Order from the Office of Chief Counsel, Department of Homeland Security, Federal Emergency Management Agency, to not discuss any aspect of the formaldehyde in FEMA family housing units. We were instructed to limit any discussion or release of the data itself and our analysis of the data to Joe Little and Scott Wright and DHS/FEMA's Office of Chief Counsel.

Thank you for your cooperation in this sensitive matter,

Scott V. Wright
Joseph D. Little
Emergency Response Coordinators
CDC/ATSDR
770-488-3430

From: Nickle, Richard (ATSDR/DTEM/PRMSB)
Sent: Thursday, December 07, 2006 9:46 AM
To: Zarus, Gregory M. (ATSDR/DHAC/EISAB)
Cc: Florence, John (ATSDR/OC); Wright, Scott V. (ATSDR/DTEM/PRMSB); Little, Joseph D. (ATSDR/DTEM/PRMSB)
Subject: RE: FEMA Trailers

Greg, Scott and Joe are working on that. They got the data package yesterday and it is over 500 pages long.

Rich Nickle
ATSDR Emergency Response

From: Zarus, Gregory M. (ATSDR/DHAC/EISAB)
Sent: Thursday, December 07, 2006 9:43 AM
To: Nickle, Richard (ATSDR/DTEM/PRMSB)
Cc: Florence, John (ATSDR/OC)
Subject: FEMA Trailers

Rich,

Could you keep John in the loop about where we are with reviewing the trailer data.
John received press calls that "ATSDR" was reviewing the data currently.

Last time I was in the loop was July to review the (then) sampling plan (below).

Greg

<< File: Draft Formaldehyde QASP_7_28_06.Doc >>

From: Florence, John (ATSDR/OC)
Sent: Wednesday, December 06, 2006 6:46 PM
To: Zarus, Gregory M. (ATSDR/DHAC/EISAB)
Cc: Green, Charles (ATSDR/OC)
Subject: RE: Conference activities - My attempt to provide a summary of our activities at the conference

Nickle, Richard (ATSDR/DTEM/PRMSB)

From: Nickle, Richard (ATSDR/DTEM/PRMSB)
Sent: Tuesday, December 26, 2006 10:13 AM
To: Holler, James S. (Jim) (ATSDR/DTEM/PRMSB)
Cc: Zarus, Gregory M. (ATSDR/DHAC/EISAB)
Subject: FW: ATSDR's Emergency Response Weekly Activities

Per Greg's request, I reviewed the information in the weekly and the only thing that I think might be significant enough to warrant an inquiry from outside the division would be the FEMA trailers issue. The rest of these are pretty routine matters. I'm not real certain what prompted this request for highlights, so let me point out a couple of other things that might come up depending on who is asking about our activities.

The explosion in MA might come up since it seems a high profile event for the region, but we have been working it since the end of November. Susan Cogdon, the environmental health lead for MaDPH, mentioned that response to Dr. Frumkin in a informal discussion at the environmental health conference earlier this month as an example of how ATSDR works well with states. I would expect it would have come up already if it was going to. We are reviewing data packages from EPA and turning around evaluations in 24 hours.

PSC, the odor problem in Fayetteville, still hangs on in the local media, but we haven't been very active in that site in a couple of weeks. The state has the lead there and has been working with the GA Poison Control as well as EPA and ourselves to put out a health consult.

On the preparedness side, we have things like the HHS ESF-8 Playbook development for the 15 scenarios under HSPD-8, where we are representing CDC/ATSDR on their chlorine scenario workgroup at the request of OTPER. We also have the Environmental Health Target Capability List work that we are working with the CDC/Homeland Security workgroup on, again at the request of OTPER. These efforts are just now getting organized and most of the work will go down in January 2007.

Rich Nickle
ATSDR Emergency Response

From: Cseh, Larry (ATSDR/DTEM/PRMSB)
Sent: Friday, December 22, 2006 9:38 AM
To: Nickle, Richard (ATSDR/DTEM/PRMSB); Abadin, Henry (ATSDR/DTEM/ATB); Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH); Ashizawa, Annette (ATSDR/DTEM/ATB); Auf der Heide, Erik (ATSDR/DTEM/EMESB); Ayers, David H. (ATSDR/DTEM/OD); Benken, Donald (CDC/CCEHIP/NCEH); Bonzo, Sandra E. (CDC/CCEHIP/NCIPC); Burgess, Paula (ATSDR/DTEM/PRMSB); Campolucci, Sharon (ATSDR/DHS/OD); Chou, Selene (ATSDR/DTEM/PRMSB); Cibulas, William (ATSDR/DHAC/OD); Crawford, Jewel L. (ATSDR/DTEM/PRMSB); Cronin, Diana (ATSDR/DTEM/EMESB); Cseh, Larry (ATSDR/DTEM/PRMSB); Dawkins, Olga B. (ATSDR/DTEM/ATB); De Rosa, Christopher (Chris) (ATSDR/DTEM/OD); Deitchman, Scott (CDC/CCEHIP/NCEH); Delli Aglio, Damon M. (ATSDR/DTEM/PRMSB) (CTR); Demchuk, Eugene (ATSDR/DTEM/OD); Dennard, Evelyn (ATSDR/DTEM/PRMSB); DePaul, Roiene (CDC/CCEHIP/NCIPC); Doyle, John R. (ATSDR/DTEM/EMESB); Faroon, Obaid (ATSDR/DTEM/ATB); Fay, Mike (ATSDR/DTEM/OD); Forrester, Tina (ATSDR/DRO); Fowler, Bruce (ATSDR/DTEM/OD); Frumkin, Howard (ATSDR/OA/OD); Gehle, Kimberly (ATSDR/DTEM/EMESB); Gilbert, Wanda R. (ATSDR/DTEM/OD); Going, William (Todd) (ATSDR/DHAC/OD); Grant, Delores (ATSDR/DTEM/OD) (CTR); Hanley, G. Douglas (Doug) (ATSDR/DTEM/PRMSB); Hansen, Hugh (ATSDR/DTEM/OD); Harper, Carolyn (ATSDR/DTEM/ATB); Hatcher, Michael (ATSDR/DTEM/EMESB); Hicks, Heraline (ATSDR/DTEM/ATB); Hill, Melva, D. (ATSDR/DTEM/OD); Holler, James S. (Jim) (ATSDR/DTEM/PRMSB); Jenkins, Kimberly E.

(Kim) (ATSDR/DTEM/EMESB); Johnson, Collette J. (ATSDR/DTEM/OD); Jolly, Ronald T. (ATSDR/DTEM/EMESB); Jones, Dennis E. (ATSDR/DTEM/OD); Keim, Mark (CDC/CCEHIP/NCEH); Keith, Sam (ATSDR/DTEM/ATB); Millette, Deborah (CDC/CCEHIP/NCEH); Muhammad, Yahya (ATSDR/OA/OD) (CTR); Mumtaz, Moiz (ATSDR/DTEM/OD); Murray, Ed (ATSDR/DTEM/ATB); Peters, Renee (ATSDR/DTEM/ATB) (CTR); Pohl, Hana R. (ATSDR/DTEM/PRMSB); Radke, Marilyn (CDC/NIOSH/DSHEFS); Risher, John (ATSDR/DTEM/ATB); Roberts, Delene (ATSDR/DTEM/EMESB); Roney, Nickolette (ATSDR/DTEM/ATB); Rosemond, Zemoria (ATSDR/DTEM/ATB); Ruiz, Patricia (ATSDR/DTEM/OD) (CTR); Schwartz, Michael (ATSDR/DTEM/PRMSB); Scinicariello, Franco (ATSDR/DTEM/ATB); Sinks, Tom (ATSDR/OA/OD); Smith, Casandra V. (ATSDR/DTEM/ATB); Stevens, Yee-Wan (ATSDR/DTEM/ATB); Tarrago, Oscar (ATSDR/DTEM/EMESB); Taylor, Jessilynn B. (ATSDR/DTEM/ATB); Telfer, Jana L. (CDC/CCEHIP/NCEH); Tencza, Brian (ATSDR/DTEM/EMESB); Todd, Glenn D. (Dan) (ATSDR/DTEM/ATB); Tomei-Torres, Francisco A. (ATSDR/DTEM/EMESB); Touch Jr, Ralph (ATSDR/DTEM/OD); Tucker, Pamela G. (ATSDR/DTEM/EMESB); Tullos, James (ATSDR/DTEM/EMESB); Tylenda, Carolyn (ATSDR/DTEM/PRMSB); Washington, Yvette M. (ATSDR/DHAC/OD); Wilbur, Sharon (ATSDR/DTEM/ATB); Williams, Malcolm (ATSDR/DTEM/ATB); Williams, Robert L. (ATSDR/DTEM/PRMSB); Williams-Fleetwood, Sharon O. (ATSDR/DHAC/OD); Williamson, G. David (ATSDR/DHS/OD); Wilson, Jewell D. (ATSDR/DTEM/OD); Wright, Scott V. (ATSDR/DTEM/PRMSB); Yu, Dianyi (ATSDR/DTEM/EMESB); Zarus, Gregory M. (ATSDR/DHAC/EISAB)

Subject: ATSDR's Emergency Response Weekly Activities as of 12/22/2006 09:34

OPERATIONS

- ERT provided follow-up for Reg. 8 about request on a Brown fields plan to place a school on a municipal solid waste landfill. Levels were all low, but insufficient number for a 50 acre site.

- ERT provided a TA about the Hazardous Air Pollutants (HAP) in asphalt to DRO Region IV: Listed: (1) the contaminants that are reported by EPA; (2) contaminants measured by NIOSH and ATSDR at the asphalt sites that they investigated; (3) the health conclusions from each of the NIOSH and ATSDR reports.

- ERT provided a TA about HAPs in wood treatment liquids to Region IV EPA Air Branch: listed those compounds in the methods used at 3 ATSDR-related sites and listed those that were detected.

- ERT received a call from a private citizen about a herbicide exposures in a town in TN. We are working closely with TN Dept of Ag and TN DOH to gather additional information.

- Throughout the week, ERT continued support of ATSDR I, EPA I, and the state in response to a facility explosion in MA. EPA was conducting an emergency removal action of various VOCs used in the facility. This week, ATSDR reviewed two data packages, completed an AROA discussing an exceedance of the site specific action level for toluene, drafted a second AROA on the detection of a new compound in one of the new data sets, transmitted an email evaluation of the second data set which had no exceedances and no new compounds in the field samples. Assuming the response continues on schedule, EPA anticipates 6 more data packages for the site and will likely request same day turnaround on ATSDR review and state concurrence.

- On 12/19 ERT contacted FEMA, Office of General Counsel, to discuss the general trends found in the evaluation of the data from the Formaldehyde Sampling Project for FEMA Temporary Housing Units located in Baton Rouge, Louisiana. The final written comments will be completed after the first of the new year (2007).

- On 12/20, ERT assisted ATSDR X in developing potential response options to an

Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)

From: Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Sent: Saturday, January 06, 2007 3:38 PM
To: Keim, Mark (CDC/CCEHIP/NCEH)
Subject: Re: Topic for Monday January 8 issues management meeting

Be glad to

Mike

Sent from my BlackBerry Wireless Device

-----Original Message-----
From: Keim, Mark (CDC/CCEHIP/NCEH) <mjk9@cdc.gov>
To: Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH) <mia2@cdc.gov>
Sent: Sat Jan 06 15:32:02 2007
Subject: Topic for Monday January 8 issues management meeting

Mike,

I dropped a couple of copies of the DTEM health consultation for formaldehyde sampling at FEMA temporary housing units into your mailbox. It's relatively open and shut case, that just needs to be run by OD.

I highlighted the main points in one of the copies, but the bottom line is FEMA asked DTM to evaluate indoor air samples that were collected by EPA from temporary housing units similar to those ones used in Katrina. The bottom line of the investigation revealed that air formaldehyde levels could be significantly decreased below levels of concern, (which is in effect level associate with narrowing of the bronchi in sensitive individuals), within four days by opening the windows or using the fan to bring in fresh air.

DTEM asked us to pass this on to Dr. Frumkin because they think that the reply letter and report should likely come from him. I asked Louise Williams to place this on the agenda for the January 8 issues management meeting, so that Dr. Frumkin can decide if he wants to send a letter or if he wants you or I to do so. I forgot that I'm going to be in jury duty on Monday. Otherwise I wouldn't be bothering you with this at the last minute. Would you please present this to Howie on Monday?

All my best,

Mark

Mark Keim, MD
Associate Director
NCEH/ATSDR Office of Terrorism Preparedness and Emergency Response Centers for Disease Control and Prevention 4770 Buford Highway, MS-F29 Atlanta, GA 30341
Telephone: (770) 488-7145

Little, Joseph D. (ATSDR/DTEM/PRMSB)

From: Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
nt: Monday, January 08, 2007 7:54 AM
.o: Little, Joseph D. (ATSDR/DTEM/PRMSB); Wright, Scott V. (ATSDR/DTEM/PRMSB)
Subject: FEMA trailer Formaldehyde consult

Hi guys,

I'll be presenting this to Howie this morning. I'll let you know how he wants to proceed.

Mike

Little, Joseph D. (ATSDR/DTEM/PRMSB)

From: Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
nt: Monday, January 08, 2007 2:27 PM
: Little, Joseph D. (ATSDR/DTEM/PRMSB); Wright, Scott V. (ATSDR/DTEM/PRMSB)
Cc: Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH); Keim, Mark (CDC/CCEHIP/NCEH)
Subject: formaldehyde consult

Joe and Scott,

Your consult looked good to me from a content standpoint. Frumkin had some concerns however. He wants an executive summary and some conclusions in the letter.

I suggest you wait until I hear back from him with details, but be prepared to do a short executive summary and put the essence of your conclusions and recommendations in the cover letter. There may be more changes needed depending on how he reacts. I'll let you hear as soon as I know.

Thanks.

Mike

Exec. Summary 1/16/07
last modified 1/18/07 10:13 am

Formaldehyde Sampling at FEMA Temporary Housing Units
Baton Rouge, Louisiana

Executive Summary:

The ATSDR Emergency Response program was requested by the Federal Emergency Management Agency (FEMA), Office of General Counsel (OGC) to review and provide an evaluation of analytical data related to a project involving formaldehyde sampling at FEMA temporary housing units located in Baton Rouge, Louisiana. The examples of temporary housing units used in the study are similar to those utilized by Hurricane Katrina displaced persons.

The objectives of the sampling project included the establishment of general baseline concentrations for formaldehyde and other VOCs in the 96 trailers involved in the study and evaluate the general effect of two separate and distinct ventilation practices used on these particular trailers. In Group A, ventilation was provided by running the air conditioning system; in Group B, ventilation was provided by opening windows and vents.

The method of ventilation which allows for the greatest number of air exchanges will be the most effective in lowering the concentration of formaldehyde. The method of ventilation used in trailer group B, of opening all windows, static vents, and exhaust fan vents, was more effective at lowering the concentration of formaldehyde during the period of this sampling project than the method of ventilation used in trailer Group A of running the air conditioning system with the bathroom static vents open.

The average concentration of formaldehyde per day in Group B trailers, after the fourth day of sampling and for the remainder of the study, was below the level of concern for sensitive individuals of 369 ug/m3 (0.3 ppm). The average concentration of formaldehyde per day in Group A trailers was above the level of concern for sensitive individuals in all but two days of the study.

The concentrations of the other VOCs detected during the sampling project were below levels expected to produce adverse health effects.

Increasing the ventilation to provide for the greatest number of air exchanges will be the most effective action in lowering the potential exposure to formaldehyde.

Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)

From: Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Sent: Thursday, January 18, 2007 1:04 PM
To: Williams, Louise W. (ATSDR/OA/OD)
Subject: Formaldehyde consultation

Hi Louise,

If you remember back to a couple of staff meetings ago, I presented to Dr. Frumkin a consultation that the ATSDR ER Team had done on formaldehyde in FEMA temporary housing facilities. I never got any further comments back from him, but have asked the guys in ATSDR to respond to the comments he did provide in the meeting. I have the consult ready to go, but don't feel that it needs to go beyond Tom for further review. If I bring it to you today or tomorrow, can we set it up for Tom's review - or can Helen set it up?

If Tom feels the need to further brief Dr. Frumkin he can take it to him. I just need to get this consult off-center and out the door. The FEMA folks are wanting it pretty soon.

Please let me know how you think we should proceed and thanks for your help.

Mike

Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)

From: Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Sent: Friday, January 19, 2007 6:18 PM
To: Williams, Louise W. (ATSDR/OA/OD)
Subject: Re: Issues Management Topics

Excellent idea. I'd like to notch it down a bit on everyones radar if possible.

Enjoy your weekend!!!

Sent from my BlackBerry Wireless Device

-----Original Message-----
From: Williams, Louise W. (ATSDR/OA/OD)
To: Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Sent: Fri Jan 19 17:40:21 2007
Subject: RE: Issues Management Topics

Hi Mike,
If you still only want Tom's review maybe you can get here around 8:45 am and speak with him before Issues Management meeting and you won't have to discuss it with the "group." :-) What do you think?

Louise

From: Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Sent: Friday, January 19, 2007 4:12 PM
To: Williams, Louise W. (ATSDR/OA/OD)
Subject: RE: Issues Management Topics

Louise,

I did not get to talk to Tom so I guess the Formaldehyde consult for FEMA needs a very brief mention - don't need but 5 minutes.

I have meetings Monday morning and all day wednesday, but the rest of the week is fairly open if I need to help with interviews.

Thanks. have a good weekend! See you Monday first thing.

Mike

From: Williams, Louise W. (ATSDR/OA/OD)
Sent: Friday, January 19, 2007 3:54 PM
To: Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH); Aloisio, Carol (ATSDR/OFAS/OD); Bashor, Mark M. (CDC/CCEHIP/NCEH); Davis, Richard (CDC/CCEHIP/NCEH); DiSirio, Marilyn (CDC/CCEHIP/NCEH); Fielding, Sascha (CDC/CCEHIP/NCEH); Fishman, Julie (ATSDR/OA/OD); Frumkin, Howard (ATSDR/OA/OD); Furphy, Larry (CDC/CCEHIP/NCEH); Keim, Mark (CDC/CCEHIP/NCEH); Meiburg, Stanley (CDC/CCEHIP/NCEH); Rose, Kenneth (ATSDR/OPPE); Sinks, Tom (ATSDR/OA/OD); Telfer, Jana L. (CDC/CCEHIP/NCEH); Vindigni, Stephen M. (CDC/CCEHIP/NCEH); Williams, Louise W. (ATSDR/OA/OD); Youson, Michael A. (Mike) (ATSDR/OFAS/OD)
Subject: Issues Management Topics

Good afternoon everyone,
Please send me your topics for Monday's Issues Management Meeting. Please note that Monday's meeting is scheduled for 9 am in the OD Conference Room.
Thank you.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Agency for Toxic Substances
and Disease Registry
Atlanta GA 30333

February 1, 2007

Patrick Edward Preston, Trial Attorney
Office of Chief Counsel
Federal Emergency Management Agency
U.S. Department of Homeland Security
500 C Street, SW
Washington, D.C. 20472
(202) 646-4536

Dear Mr. Preston:

Enclosed you will find the Health Consultation produced by the Agency for Toxic Substances and Disease Registry (ATSDR). This document discusses the evaluation of the EPA produced analytical data which was generated from the sampling of the Federal Emergency Management Agency (FEMA) provided manufactured homes during the time period of September 19 – October 7, 2006. This Health Consultation was derived utilizing the most valid and current scientific data available to ATSDR. Per your request, the data and the subsequent analysis of the data has not been shared with anyone other than Scott V. Wright and Joseph D. Little. In summary, the opening of windows and vents was effective in reducing formaldehyde concentrations below levels of health concern. Running the heating, ventilation and air conditioning systems did not provide adequate air exchanges to adequately reduce the formaldehyde concentrations. A combination of ventilation methods may be necessary to reduce formaldehyde concentrations below levels of health concern for sensitive individuals. FEMA has not requested ATSDR to evaluate longer term formaldehyde concentrations in trailers or health concerns related to potential exposures. ATSDR will be available to provide assistance, if such data becomes available in the future. The consultation is not intended to establish FEMA's future policy concerning temporary housing units.

Please contact me directly with any questions or concerns at 770-488-7145.

Sincerely,

Mike Allred for Mark Keim

Mark E. Keim, MD
Acting Associate Director
Office of Terrorism, Preparedness and
Emergency Response
National Center for Environmental
Health/Agency for Toxic Substances and
Disease Registry

cc:
P. Michael Allred, Deputy Director, OTPER
Joseph D. Little, ERC, DTEM
Scott V. Wright, ERC, DTEM

Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)

From:	Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Sent:	Thursday, February 15, 2007 2:30 PM
To:	Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Subject:	FEMA temp housing

I spoke with Patrick (Rick) Preston of FEMA about the temporary housing issues.

202/646-3825

Hundreds of thousands of people in temp housing facilities

Issue is not just Katrina/Rita but for other disasters.

Holler, James S. (Jim) (ATSDR/DTEM/PRMSB)

From: Nickle, Richard (ATSDR/DTEM/PRMSB)
Sent: Friday, February 02, 2007 2:26 PM
To: Abadin, Henry (ATSDR/DTEM/ATB); Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH); Ashizawa, Annette (ATSDR/DTEM/ATB); Auf der Heide, Erik (ATSDR/DTEM/EMESB); Ayers, David H. (ATSDR/DTEM/OD); Benken, Donald (CDC/CCEHIP/NCEH); Bonzo, Sandra E. (CDC/CCEHIP/OD); Burgess, Paula (ATSDR/DTEM/PRMSB); Campolucci, Sharon (ATSDR/DHS/OD); Chou, Selene (ATSDR/DTEM/PRMSB); Cibulas, William (ATSDR/DHAC/OD); Crawford, Jewel L. (ATSDR/DTEM/PRMSB); Cronin, Diana (ATSDR/DTEM/EMESB); Cseh, Larry (ATSDR/DTEM/PRMSB); Dawkins, Olga B. (ATSDR/DTEM/ATB); De Rosa, Christopher (Chris) (ATSDR/DTEM/OD); Deitchman, Scott (CDC/CCEHIP/NCEH); Delli Aglio, Damon M. (ATSDR/DTEM/PRMSB) (CTR); Demchuk, Eugene (ATSDR/DTEM/OD); Dennard, Evelyn (ATSDR/DTEM/PRMSB); DePaul, Rolene (CDC/CCEHIP/NCIPC); Doyle, John R. (ATSDR/DTEM/EMESB); Faroon, Obaid (ATSDR/DTEM/ATB); Fay, Mike (ATSDR/DTEM/OD); Forrester, Tina (ATSDR/DRO); Fowler, Bruce (ATSDR/DTEM/OD); Frumkin, Howard (ATSDR/OA/OD); Gehle, Kimberly (ATSDR/DTEM/EMESB); Gilbert, Wanda R. (ATSDR/DTEM/OD); Going, William (Todd) (ATSDR/DHAC/OD); Grant, Delores (ATSDR/DTEM/OD) (CTR); Hanley, G. Douglas (Doug) (ATSDR/DTEM/PRMSB); Hansen, Hugh (ATSDR/DTEM/OD); Harper, Carolyn (ATSDR/DTEM/ATB); Hatcher, Michael (ATSDR/DTEM/EMESB); Hicks, Heraline (ATSDR/DTEM/ATB); Hill, Melva, D. (ATSDR/DTEM/OD); Holler, James S. (Jim) (ATSDR/DTEM/PRMSB); Jenkins, Kimberly E. (Kim) (ATSDR/DTEM/EMESB); Johnson, Collette J. (ATSDR/DTEM/OD); Jolly, Ronald T. (ATSDR/DTEM/EMESB); Jones, Dennis E. (ATSDR/DTEM/OD); Keim, Mark (CDC/CCEHIP/NCEH); Keith, Sam (ATSDR/DTEM/ATB); Little, Joseph D. (ATSDR/DTEM/PRMSB); Millette, Deborah (CDC/CCEHIP/NCEH); Muhammad, Yahya (ATSDR/OA/OD) (CTR); Mumtaz, Moiz (ATSDR/DTEM/OD); Murray, Ed (ATSDR/DTEM/ATB); Nickle, Richard (ATSDR/DTEM/PRMSB); Peters, Renee (ATSDR/DTEM/ATB) (CTR); Pohl, Hana R. (ATSDR/DTEM/PRMSB); Radke, Marilyn (CDC/NIOSH/DSHEFS); Risher, John (ATSDR/DTEM/ATB); Roberts, Delene (ATSDR/DTEM/EMESB); Roney, Nickolette (ATSDR/DTEM/ATB); Rosemond, Zemoria (ATSDR/DTEM/ATB); Ruiz, Patricia (ATSDR/DTEM/OD) (CTR); Schwartz, Michael (ATSDR/DTEM/PRMSB); Scinicariello, Franco (ATSDR/DTEM/ATB); Sinks, Tom (ATSDR/OA/OD); Smith, Casandra V. (ATSDR/DTEM/ATB); Stevens, Yee-Wan (ATSDR/DTEM/ATB); Tarrago, Oscar (ATSDR/DTEM/EMESB); Taylor, Jessilynn B. (ATSDR/DTEM/ATB); Telfer, Jana L. (CDC/CCEHIP/NCEH); Tencza, Brian (ATSDR/DTEM/EMESB); Todd, Glenn D. (Dan) (ATSDR/DTEM/ATB); Tomei-Torres, Francisco A. (ATSDR/DTEM/EMESB); Touch Jr, Ralph (ATSDR/DTEM/OD); Tucker, Pamela G. (ATSDR/DTEM/EMESB); Tullos, James (ATSDR/DTEM/EMESB); Tylenda, Carolyn (ATSDR/DTEM/PRMSB); Washington, Yvette M. (ATSDR/DHAC/OD); Wilbur, Sharon (ATSDR/DTEM/ATB); Williams, Malcolm (ATSDR/DTEM/ATB); Williams, Robert L. (ATSDR/DTEM/PRMSB); Williams-Fleetwood, Sharon O. (ATSDR/DHAC/OD); Williamson, G. David (ATSDR/DHS/OD); Wilson, Jewell D. (ATSDR/DTEM/OD); Wright, Scott V. (ATSDR/DTEM/PRMSB); Yu, Dianyi (ATSDR/DTEM/EMESB); Zarus, Gregory M. (ATSDR/DHAC/EISAB)
Subject: ATSDR Emergency Response Weekly Activity Report - 2/01/2007

OPERATIONS

Throughout the week, ERT continued support of EPA I, ATSDR I, and State Health after an explosion in a print shop in a residential area in MA. This week, ERT received and reviewed one data package, completed an AROA discussing the health implications of the data, reviewed a revised ambient air sampling plan, and discussed the significance of contaminants detected in laboratory blanks.

On 1/30, ERT provided the state health with medical management information following a release of maleic anhydride at a chemical facility in LA.

On 1/31, ERT provided assistance to the Florida Dept. of Health in establishing cleanup goals following a mercury release from a broken blood pressure cuff in an exam room located at a county health clinic.

On 2/1, ERT finalized the Formaldehyde Health Consultation for the Federal Emergency Management Agency (FEMA). This consultation discusses the evaluation of EPA data generated from sampling of FEMA manufactured homes during the time period of September 19 – October 7, 2006. A total of 96 new, never occupied homes were tested at a location in the Greater New Orleans/Baton Rouge area. In summary, the opening of windows and vents was effective in reducing formaldehyde concentrations below levels of health concern. Running the heating, ventilation and air conditioning systems did not provide adequate air exchanges to adequately reduce the formaldehyde concentrations.

PREPAREDNESS

On 1/26, ERT assisted NCEH with information on resource persons from outside CDC/ATSDR for emergency response planning guidance.

Rich Nickle
ATSDR Emergency Response

Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)

From: Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Sent: Friday, March 02, 2007 3:58 PM
To: Keim, Mark (CDC/CCEHIP/NCEH)
Subject: RE: Topics for Monday

I have some information to update in response to Tom's direction. Finally got some info from FEMA and talked with Jim Rifenburg and Ed Murray.

From: Keim, Mark (CDC/CCEHIP/NCEH)
Sent: Friday, March 02, 2007 2:31 PM
To: Williams, Louise W. (ATSDR/OA/OD)
Cc: Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Subject: RE: Topics for Monday

1. Formaldehyde in FEMA trailers

From: Williams, Louise W. (ATSDR/OA/OD)
Sent: Friday, March 02, 2007 2:09 PM
To: Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH); Aloisio, Carol (ATSDR/OFAS/OD); Bashor, Mark M. (CDC/CCEHIP/NCEH); Davis, Richard (CDC/CCEHIP/NCEH); DiSirio, Marilyn (CDC/CCEHIP/NCEH); Fielding, Sascha (CDC/CCEHIP/NCEH); Fishman, Julie (ATSDR/OA/OD); Frumkin, Howard (ATSDR/OA/OD); Furphy, Larry (CDC/CCEHIP/NCEH); Keim, Mark (CDC/CCEHIP/NCEH); Rose, Kenneth (ATSDR/OPPE); Sinks, Tom (ATSDR/OA/OD); Telfer, Jana L. (CDC/CCEHIP/NCEH); Vindigni, Stephen M. (CDC/CCEHIP/NCEH); Williams, Louise W. (ATSDR/OA/OD); Youson, Michael A. (Mike) (ATSDR/OFAS/OD)
Subject: Topics for Monday

Good afternoon all,
Please send me your topics for Monday's Issues Management Meeting, 8:30-9:30 am.
Thank you

Louise

Fax 404-498-0083
E-mail hfrumkin@cdc.gov
FedEx deliveries:
325 Century Boulevard
Atlanta, GA 30345

From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Thursday, March 08, 2007 9:34 AM
To: Frumkin, Howard (ATSDR/OA/OD); Sinks, Tom (ATSDR/OA/OD)
Cc: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Subject: Draft Letter to FEMA
Importance: High

Howie and Tom,

I am resending the previous email (below) which describes my concerns regarding the formaldehyde health consultation. If I receive no objections from you, I will send the attached letter to FEMA by C.O.B Friday, March 9.

Chris

---

om: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Tuesday, February 27, 2007 7:22 PM
To: Frumkin, Howard (ATSDR/OA/OD); Sinks, Tom (ATSDR/OA/OD)
Cc: Holler, James S. (Jim) (ATSDR/DTEM/PRMSB); Murray, Ed (ATSDR/DTEM/ATB)
Subject: FW: Draft Letter

Howie and Tom,
This is the issue that I discussed w/ you Tom this afternoon. The letter captures some of my concerns on this consult which I saw for the first time today. In my discussions w/ staff, regarding why I was not in the loop, I was informed that they were working on this under the directions of your office. I now have a clearer picture of this and have reaffirmed our SOP's that have been in place for many years. I regret this breakdown and have addressed this issue w/ our staff.
I have no intention of pursuing this any further until I have direction from your office.
Chris
Christopher T. De Rosa, M.S., Ph.D.
Director, Division of Toxicology and Environmental Medicine
Agency for Toxic Substances and Disease Registry
1600 Clifton Road - Mailstop F32
Atlanta, GA 30333
(770) 488-7003

Patrick Edward
Preston.doc

February 27, 2007

Patrick Edward Preston, Trial Attorney
Office of Chief Counsel
Federal Emergency Management Agency
US Department of Homeland Security
500 C Street, SW
Washington, DC 20472
(202) 646-4536

Dear Mr. Preston:

It has just come to my attention that the Health Consultation "Formaldehyde Sampling at FEMA Temporary Housing Units" has been completed without a policy review by our senior technical staff. I am concerned that this health consultation is incomplete and perhaps misleading.

Formaldehyde is classified as "reasonably anticipated to be a human carcinogen. As such, there is no recognized "safe level" of exposure. Thus, any level of exposure to formaldehyde may pose a cancer risk, regardless of duration. Failure to communicate this issue is possibly misleading, and a threat to public health. I had discussed this issue several months ago in a review of the public statement derived from Toxicological Profile that FEMA proposed. I specified at that time that this statement contained no mention of the cancer risk and that should be a public health concern.

Thank you for your consideration of this issue and please feel free to contact me. Failure to speak to the long-term cancer risk regarding formaldehyde exposure irrespective of duration is of particular concern.

Christopher T. De Rosa, M.S., Ph.D.
Director, Division of Toxicology and Environmental Medicine
Agency for Toxic Substances and Disease Registry

Holler, James S. (Jim) (ATSDR/DTEM/PRMSB)

From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Friday, March 09, 2007 4:00 PM
To: Keim, Mark (CDC/CCEHIP/NCEH); Holler, James S. (Jim) (ATSDR/DTEM/PRMSB)
Subject: FW: Draft Letter to FEMA

Importance: High

Attachments: Patrick Edward Preston.doc

Mark /Jim
fyi
Chris

Christopher T. De Rosa, M.S., Ph.D.
Director, Division of Toxicology and Environmental Medicine
Agency for Toxic Substances and Disease Registry
1600 Clifton Road - Mailstop F32
Atlanta, GA 30333
(770) 488-7003

From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Thursday, March 08, 2007 9:34 AM
To: Frumkin, Howard (ATSDR/OA/OD); Sinks, Tom (ATSDR/OA/OD)
Cc: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Subject: Draft Letter to FEMA
Importance: High

Howie and Tom,

I am resending the previous email (below) which describes my concerns regarding the formaldehyde health consultation. If I receive no objections from you, I will send the attached letter to FEMA by C.O.B Friday, March 9.

Chris

From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Tuesday, February 27, 2007 7:22 PM
To: Frumkin, Howard (ATSDR/OA/OD); Sinks, Tom (ATSDR/OA/OD)
Cc: Holler, James S. (Jim) (ATSDR/DTEM/PRMSB); Murray, Ed (ATSDR/DTEM/ATB)
Subject: FW: Draft Letter

Howie and Tom,
This is the issue that I discussed w/ you Tom this afternoon. The letter captures some of my concerns on this consult which I saw for the first time today. In my discussions w/ staff, regarding why I was not in the loop, I was informed that they were working on this under the directions of your office. I now have a clearer picture of this and have reaffirmed our SOP's that have been in place for many years. I regret this breakdown and have addressed this issue w/ our staff.
I have no intention of pursuing this any further until I have direction from your office.
Chris
Christopher T. De Rosa, M.S., Ph.D.
Director, Division of Toxicology and Environmental Medicine
Agency for Toxic Substances and Disease Registry

1600 Clifton Road - Mailstop F32
Atlanta, GA 30333
(770) 488-7003

Patrick Edward
Preston.doc (30...

February 27, 2007

Patrick Edward Preston, Trial Attorney
Office of Chief Counsel
Federal Emergency Management Agency
US Department of Homeland Security
500 C Street, SW
Washington, DC 20472
(202) 646-4536

Dear Mr. Preston:

It has just come to my attention that the Health Consultation "Formaldehyde Sampling at FEMA Temporary Housing Units" has been completed without a policy review by our senior technical staff. I am concerned that this health consultation is incomplete and perhaps misleading.

Formaldehyde is classified as "reasonably anticipated to be a human carcinogen. As such, there is no recognized "safe level" of exposure. Thus, any level of exposure to formaldehyde may pose a cancer risk, regardless of duration. Failure to communicate this issue is possibly misleading, and a threat to public health. I had discussed this issue several months ago in a review of the public statement derived from Toxicological Profile that FEMA proposed. I specified at that time that this statement contained no mention of the cancer risk and that should be a public health concern.

Thank you for your consideration of this issue and please feel free to contact me. Failure to speak to the long-term cancer risk regarding formaldehyde exposure irrespective of duration is of particular concern.

Christopher T. De Rosa, M.S., Ph.D.
Director, Division of Toxicology and Environmental Medicine
Agency for Toxic Substances and Disease Registry

Vatave, Ajay (CDC/CCEHIP/NCEH)

From: Frumkin, Howard (ATSDR/OA/OD)
Sent: Tuesday, August 07, 2007 6:16 PM
To: Fielding, Sascha (CDC/CCEHIP/NCEH); McGeehin, Mike (CDC/CCEHIP/NCEH); Sinks, Tom (ATSDR/OA/OD)
Subject: FW: Draft Letter to FEMA

Importance: High

Attachments: Patrick Edward Preston.doc

My e-mail on this from March 9.

Howard Frumkin, M.D., Dr.P.H., Director
National Center for Environmental Health /
Agency for Toxic Substances and Disease Registry
Centers for Disease Control and Prevention
1600 Clifton Road, MS E-28
Atlanta, GA 30333
Tel 404-498-0004
Fax 404-498-0083
E-mail hfrumkin@cdc.gov
FedEx deliveries:
1825 Century Boulevard
Atlanta, GA 30345

From: Frumkin, Howard (ATSDR/OA/OD)
Sent: Friday, March 09, 2007 4:04 PM
To: Keim, Mark (CDC/CCEHIP/NCEH)
Cc: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD); Sinks, Tom (ATSDR/OA/OD)
Subject: FW: Draft Letter to FEMA
Importance: High

Mark:
Chris contacted me about a week ago, as you can see below, with concerns that we had responded to a FEMA request about formaldehyde exposures in mobile homes and had restricted our response to acute toxicity (omitting to mention formaldehyde carcinogenicity). He's right; a complete response would need to make reference to both acute and chronic toxicity. I understand that our response to FEMA came from your office. If that's correct, I want to ask you to follow up that response with a second communication to FEMA, noting our omission and correcting it. Chris has offered to do this directly, but I'd prefer that we speak with one voice, and it's most appropriate for the correction to come from the same source that issued the original letter. Thanks.
Howie

Howard Frumkin, M.D., Dr.P.H., Director
National Center for Environmental Health /
Agency for Toxic Substances and Disease Registry
Centers for Disease Control and Prevention
1600 Clifton Road, MS E-28
Atlanta, GA 30333
Tel 404-498-0004

Vatave, Ajay (CDC/CCEHIP/NCEH)

From: Frumkin, Howard (ATSDR/OA/OD)
Sent: Tuesday, August 07, 2007 6:17 PM
To: Fielding, Sascha (CDC/CCEHIP/NCEH); Sinks, Tom (ATSDR/OA/OD)
Subject: FW: Draft Letter to FEMA

The next one.
As I recall Mark's letter came very soon thereafter.

Howard Frumkin, M.D., Dr.P.H., Director
National Center for Environmental Health / Agency for Toxic Substances and Disease Registry Centers for Disease Control and Prevention 1600 Clifton Road, MS E-28 Atlanta, GA 30333 Tel 404-498-0004 Fax 404-498-0083 E-mail hfrumkin@cdc.gov FedEx deliveries:
1825 Century Boulevard
Atlanta, GA 30345

-----Original Message-----
From: Frumkin, Howard (ATSDR/OA/OD)
Sent: Friday, March 09, 2007 4:29 PM
To: Keim, Mark (CDC/CCEHIP/NCEH)
Cc: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD); Sinks, Tom (ATSDR/OA/OD)
Subject: RE: Draft Letter to FEMA

Thanks Mark.

Howard Frumkin, M.D., Dr.P.H., Director
National Center for Environmental Health / Agency for Toxic Substances and Disease Registry Centers for Disease Control and Prevention 1600 Clifton Road, MS E-28 Atlanta, GA 30333 Tel 404-498-0004 Fax 404-498-0083 E-mail hfrumkin@cdc.gov FedEx deliveries:
1825 Century Boulevard
Atlanta, GA 30345

-----Original Message-----
From: Keim, Mark (CDC/CCEHIP/NCEH)
Sent: Friday, March 09, 2007 4:27 PM
To: Frumkin, Howard (ATSDR/OA/OD)
Cc: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD); Sinks, Tom (ATSDR/OA/OD); Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Subject: Re: Draft Letter to FEMA

I'd be happy to do so. Chris and I have already discussed this action.

All my best,
-Mark Keim, MD

-----Original Message-----
From: Frumkin, Howard (ATSDR/OA/OD)
To: Keim, Mark (CDC/CCEHIP/NCEH)
CC: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD); Sinks, Tom (ATSDR/OA/OD)
Sent: Fri Mar 09 16:03:39 2007
Subject: FW: Draft Letter to FEMA

Mark:
Chris contacted me about a week ago, as you can see below, with concerns that we had responded to a FEMA request about formaldehyde exposures in mobile homes and had restricted our response to acute toxicity (omitting to mention formaldehyde carcinogenicity). He's right; a complete response would need to make reference to both acute and chronic toxicity. I understand that our response to FEMA came from your office. If that's correct, I want to ask you to follow up that response with a second communication to FEMA, noting our omission and correcting it. Chris has offered to do this directly, but I'd prefer that we speak with one voice, and it's most appropriate for the correction to come from the same source that issued the original letter. Thanks.
Howie

De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)

From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Friday, March 09, 2007 1:56 PM
To: Frumkin, Howard (ATSDR/OA/OD); Sinks, Tom (ATSDR/OA/OD)
Subject: RE: Draft Letter to FEMA

The consultation was developed, sent forward, and signed by our DTEM staff. They indicated to me that they had been directed to not share the information further and not to address longer term health effects. That's why IARC was cited repeatedly without reference to cancer and was not included in the literature cited.

FEMA's initial contact came directly to me nine months ago on this issue. I reviewed the proposed statement and specified that they had neglected to address longer term risk including cancer.

FEMA then came back through our COPTER office with the same request and this was then assigned to DTEM staff. After completion of the consultation our staff sent their signed consultation directly to COPTER who sent out the letter.

By separate email I have shared this proposed response with Mark Keim. If you wish for him to send it out that's fine. Otherwise I will send it out at your direction. Either way is fine with me.

Christopher T. De Rosa, M.S., Ph.D.
Director, Division of Toxicology and Environmental Medicine
Agency for Toxic Substances and Disease Registry
1600 Clifton Road - Mailstop F32
Atlanta, GA 30333
(770) 488-7003

From: Frumkin, Howard (ATSDR/OA/OD)
Sent: Friday, March 09, 2007 1:23 PM
To: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD); Sinks, Tom (ATSDR/OA/OD)
Subject: RE: Draft Letter to FEMA

OK, I've read your letter Chris. I agree with your concern and I agree that we need to amend our Health Consultation with information on cancer risk. However, I don't think a separate letter from a different location in our agency than originated the initial consultation is the right way to go. It would be better to have the author of the health assessment send an amendment, so we speak with a single voice. Did this come out of Bill Cibulas's shop?

Howard Frumkin, M.D., Dr.P.H., Director
National Center for Environmental Health /
Agency for Toxic Substances and Disease Registry
Centers for Disease Control and Prevention
1600 Clifton Road, MS E-28
Atlanta, GA 30333
Tel 404-498-0004
Fax 404-498-0083
E-mail hfrumkin@cdc.gov
FedEx deliveries:
1825 Century Boulevard
Atlanta, GA 30345

From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Thursday, March 08, 2007 9:34 AM
To: Frumkin, Howard (ATSDR/OA/OD); Sinks, Tom (ATSDR/OA/OD)

A-4-5

Cc: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Subject: Draft Letter to FEMA
Importance: High

Howie and Tom,

I am resending the previous email (below) which describes my concerns regarding the formaldehyde health consultation. If I receive no objections from you, I will send the attached letter to FEMA by C.O.B Friday, March 9.

Chris

From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Tuesday, February 27, 2007 7:22 PM
To: Frumkin, Howard (ATSDR/OA/OD); Sinks, Tom (ATSDR/OA/OD)
Cc: Holler, James S. (Jim) (ATSDR/DTEM/PRMSB); Murray, Ed (ATSDR/DTEM/ATB)
Subject: FW: Draft Letter

Howie and Tom,
This is the issue that I discussed w/ you Tom this afternoon. The letter captures some of my concerns on this consult which I saw for the first time today. In my discussions w/ staff, regarding why I was not in the loop, I was informed that they were working on this under the directions of your office. I now have a clearer picture of this and have reaffirmed our SOP's that have been in place for many years. I regret this breakdown and have addressed this issue w/ our staff.
I have no intention of pursuing this any further until I have direction from your office.
Chris

Christopher T. De Rosa, M.S., Ph.D.
Director, Division of Toxicology and Environmental Medicine
Agency for Toxic Substances and Disease Registry
1600 Clifton Road - Mailstop F32
Atlanta, GA 30333
(770) 488-7003

<< File: Patrick Edward Preston.doc >>

A-4-6

De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)

From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Tuesday, February 27, 2007 7:22 PM
To: Frumkin, Howard (ATSDR/OA/OD); Sinks, Tom (ATSDR/OA/OD)
Cc: Holler, James S. (Jim) (ATSDR/DTEM/PRMSB); Murray, Ed (ATSDR/DTEM/ATB)
Subject: FW: Draft Letter

Attachments: Patrick Edward Preston.doc

Howie and Tom,

This is the issue that I discussed w/ you Tom this afternoon. The letter captures some of my concerns on this consult which I saw for the first time today. In my discussions w/ staff, regarding why I was not in the loop, I was informed that they were working on this under the directions of your office. I now have a clearer picture of this and have reaffirmed our SOP's that have been in place for many years. I regret this breakdown and have addressed this issue w/ our staff.

I have no intention of pursuing this any further until I have direction from your office.

Chris

Christopher T. De Rosa, M.S., Ph.D.
Director, Division of Toxicology and Environmental Medicine
Agency for Toxic Substances and Disease Registry
1600 Clifton Road - Mailstop F32
Atlanta, GA 30333
(770) 488-7003

Patrick Edward Preston.doc (30...

A-84-4

February 27, 2007

Patrick Edward Preston, Trial Attorney
Office of Chief Counsel
Federal Emergency Management Agency
US Department of Homeland Security
500 C Street, SW
Washington, DC 20472
(202) 646-4536

Dear Mr. Preston:

It has just come to my attention that the Health Consultation "Formaldehyde Sampling at FEMA Temporary Housing Units" has been completed without a policy review by our senior technical staff. I am concerned that this health consultation is incomplete and perhaps misleading.

Formaldehyde is classified as "reasonably anticipated to be a human carcinogen. As such, there is no recognized "safe level" of exposure. Thus, any level of exposure to formaldehyde may pose a cancer risk, regardless of duration. Failure to communicate this issue is possibly misleading, and a threat to public health. I had discussed this issue several months ago in a review of the public statement derived from Toxicological Profile that FEMA proposed. I specified at that time that this statement contained no mention of the cancer risk and that should be a public health concern.

Thank you for your consideration of this issue and please feel free to contact me. Failure to speak to the long-term cancer risk regarding formaldehyde exposure irrespective of duration is of particular concern.

Christopher T. De Rosa, M.S., Ph.D.
Director, Division of Toxicology and Environmental Medicine
Agency for Toxic Substances and Disease Registry

DEPARTMENT OF HEALTH & HUMAN SERVICES

. Public · ealth Service

Centers for Disease Control
and Prevention (CDC)
Atlanta GA 30333

March 17, 2007

Patrick Edward Preston, Trial Attorney
Office of Chief Counsel
Federal Emergency Management Agency
US Department of Homeland Security
500 C Street, SW
Washington, DC 20472

Dear Mr. Preston:

I am writing in follow-up to my previous correspondence last month on behalf of the CDC National Center for Environmental Health/Agency for Toxic Substances and Disease Registry.

It has just come to my attention that the Health Consultation "Formaldehyde Sampling at FEMA Temporary Housing Units" has been completed without a policy review by our senior technical staff. I am concerned that this health consultation is incomplete and perhaps misleading.

Formaldehyde is classified as "reasonably anticipated to be a human carcinogen. As such, there is no recognized "safe level" of exposure. Thus, any level of exposure to formaldehyde may pose a cancer risk, regardless of duration. Failure to communicate this issue is possibly misleading, and a threat to public health. I had discussed this issue several months ago in a review of the public statement derived from Toxicological Profile that FEMA proposed. I specified at that time that this statement contained no mention of the cancer risk and that should be a public health concern.

Thank you for your consideration of this issue and please feel free to contact me. Failure to speak to the long-term cancer risk regarding formaldehyde exposure irrespective of duration is of particular concern.

Sincerely,

M. Keim, MD

Mark Keim, MD
Associate Director
Office of Terrorism Preparedness and
Emergency Response
National Centers for Environmental Health/
Agency for Toxic Substances and Disease Registry

CC: Christopher T. De Rosa, M.S., Ph.D.
Director, Division of Toxicology and Environmental Medicine
Agency for Toxic Substances and Disease Registry

Howard Frumkin, MD, PhD
Director,
National Center for Environmental Health/
Agency for Toxic Substances and Disease Registry

From: Becky Gillette [mailto:bgillette@bellsouth.net]
Sent: Tuesday, February 27, 2007 10:55 AM
To: Durant, James T. (ATSDR/DHAC/EISAB)
Subject: Formaldehyde in FEMA trailers...

James:

We have been very frustrated with the widespread poisoning of tens of thousands of people in FEMA trailers due to high levels of formaldehyde. FEMA and the MS Health Dept. refuse to do anything about it. Would this be something we could request investigated by ATSDR? Any tips for us on how to do that?

Thanks!

Becky

Becky Gillette
34 Davis Bayou Circle
Ocean Springs MS 39564
228-872-3457

Holler, James S. (Jim) (ATSDR/DTEM/PRMSB)

From: Metcalf, Susan (ATSDR/DHAC/EISAB)
Sent: Tuesday, March 06, 2007 10:33 AM
To: Holler, James S. (Jim) (ATSDR/DTEM/PRMSB); Brown, Mary Jean (CDC/CCEHIP/NCEH)
Cc: Moore, Susan (ATSDR/DHAC/EISAB); Durant, James T. (ATSDR/DHAC/EISAB)
Subject: FW: Formaldehyde in FEMA trailers...
Attachments: formaldehyde The Nation.doc

I understand that you all are the Center's leads on this issue. Could you please respond to the inquiry from Becky Gillette (first email) about formaldehyde in the FEMA trailers and the testing that was done? She is a local resident (and president of the local Sierra Club chapter) that Jim Durant met during a visit to one of his sites along the MS coast. A timely response to Ms Gillette about this concern will increase our Agency's credibility and also facilitate our team's site work.

Thank you for your help.

Susan

Susan W. Metcalf, MD
Team Leader, Exposure Investigations

Division of Health Assessment and Consultations
Agency for Toxic Substances and Disease Registry
Mail Stop E-29
1600 Clifton Road NE
Atlanta, GA 30333

Telephone 404-498-0493
FAX 404-498-0420

From: Durant, James T. (ATSDR/DHAC/EISAB)
Sent: Wednesday, February 28, 2007 8:32 AM
To: Metcalf, Susan (ATSDR/DHAC/EISAB)
Subject: FW: Formaldehyde in FEMA trailers...

Susan -

Please advice on how to respond. I am not sure what has been going on regarding the issues of the FEMA trailers. I am not even sure where to begin. I am sure that whatever I send back will be taken and carefully dissected.

James T. Durant MSPH CIH
Environmental Health Scientist
Agency for Toxic Substances and Disease Registry
1600 Clifton Road NE MS E-29
Atlanta GA 30333
404-498-0449

Pasternak, Doug

From: Becky Gillette [bgillette4@cox.net]
Sent: Thursday, February 21, 2008 1:39 PM
To: doug.pastenak@mail.house.gov
Subject: FW: formaldehyde contact at ATSDR?

This is a message from May again asking for an ATSDR contact.

-----Original Message-----
From: Becky Gillette [mailto:bgillette@bellsouth.net]
Sent: Monday, May 07, 2007 12:24 PM
To: James Durant (hzd3@cdc.gov)
Subject: formaldehyde contact at ATSDR?

James:

Did you ever find out who is handling the FEMA request for information from ATSDR regarding formaldehyde in FEMA trailers? FEMA just put out a release showing their testing showed very high levels of formaldehyde even after ventilation. But FEMA says that is below the ATSDR threshold, which is several times higher than the EPA and American Lung Assn.
guidelines.

I just tested a family with .32 ppm.they have spent over $700 on medical bills related to the toxic exposure. It is very wrong to suggest these levels-so strong they make your eyes burn-are acceptable.

Do you have a contact at ATSDR on this?

Thanks!

Becky

http://www.fema.gov/news/newsrelease.fema?id=36010

FEMA Study: Ventilating Travel Trailers Can Significantly Reduce Formaldehyde Emission Levels

Release Date: May 4, 2007
Release Number: HQ-07-061
WASHINGTON, D.C. -- The Department of Homeland Security's Federal Emergency Management Agency (FEMA) said today that its study of air samples collected from travel trailers in the Gulf shows that formaldehyde emission levels in the units can be significantly reduced through adequate ventilation.
FEMA initiated the study in response to concerns expressed about formaldehyde in the trailers and because of the high number of the units used as temporary housing following hurricanes Katrina and Rita. The objective of the study was to validate the most effective measures for lowering formaldehyde concentrations in travel trailers.
Formaldehyde is a common substance that is found in homes and buildings everywhere. It is released into the air from many household products, new permanent pressed clothing, tobacco products and cigarette smoke and construction materials as well as other sources. The most significant sources of formaldehyde in travel trailers are the pressed wood products used in flooring, cabinetry and wallboard.
The study involved collecting air samples from 96 new, unused travel trailers from Sept. 19 to Oct. 7, 2006, at a staging area in Baton Rouge, La. Only previously unoccupied trailers were tested in order to eliminate any effects from human activities that might cause formaldehyde levels to rise. The units tested had been closed for approximately six weeks before the sampling. The air sampling data was analyzed for FEMA by the Department of Health and Human Services' Agency for Toxic Substances and Disease Registry (ATSDR) in

-----Original Message-----
From: Fielding, Sascha (CDC/CCEHIP/NCEH)
To: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
CC: Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Sent: Fri Mar 23 15:03:03 2007
Subject: FEMA Trailers

<<40495 Taylor Response-FEMA (2).doc>>

Hi Chris,

We met this afternoon with Mike, Barbara (CDC/W) and a few others to discuss our response to Rep. Taylor. Mike mentioned that it would be great for you to take a look at the response to verify (or correct) the science issues discussed. We anticipate that this issue will continue to evolve and we want to be sure we have the best answer possible. I really appreciate you taking time to look this over. Since this is a Congressional response, we have a quick window to get this out. Can you please send me your comments by Monday morning at 10AM?

Thanks!
Sascha

-----Original Message-----
From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Tuesday, March 27, 2007 3:59 AM
To: Fielding, Sascha (CDC/CCEHIP/NCEH)
Subject: Re: FEMA Trailers

Hi Sasha,
The letter speaks to recirculation only in summer and not winter when there is muh less recirculation, if any.

Also I am unsure about the comparison to new homes. Having experience w/ both, there is a difference. This maybe due to the greater headspace conventional housing or the amount of formaldehyde per unit volume.

Finnaly I do think the cancer issue should be addressed in some fashion. I would con> ult our PHS on this for wordsmithing.

Chris

PS. Have you coordinated w/ Mark Keim' s offce? They recently did a consult for FcEMA on this issue
---
Sent from my BlackBerry Wireless Device

-----Original Message-----
From: Fielding, Sascha (CDC/CCEHIP/NCEH)
To: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Mon Mar 26 14:59:48 2007
Subject: RE: FEMA Trailers

Hi Chris,

Have you had a chance to review the letter of response to Rep. Taylor?
We really need to get this out right away - we are already late. I look forward to your comments.

Thanks!
Sascha

-----Original Message-----
From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Friday, March 23, 2007 3:33 PM
To: Fielding, Sascha (CDC/CCEHIP/NCEH)
Subject: Re: FEMA Trailers

Sasha Will do
Chris

Sent from my BlackBerry Wireless Device

Davis, Angela Johnson (ATSDR/OPPE) (CTR)

From: Rogers, Barbara A. (CDC/OD/CDCW)
Sent: Wednesday, March 21, 2007 2:29 PM
To: Davis, Angela Johnson (ATSDR/OPPE) (CTR); Fielding, Sascha (CDC/CCEHIP/NCEH)
Subject: RE: Toxic Trailers

Thank you ; during our call I hadn't realized the attorney who instructed ATSDR re disclosure of findings was from FEMA.
I'd be glad to discuss further, but wanted to let you know asap I think that this definitely needs to be elevated within NCEH/ATSDR; I realize I don't have all the facts, but it strikes me as highly problematic that we would follow direction from another agency to not disclose our findings re health threats.

Barbara Rogers
CDC Washington Office
(202) 260-3012 (direct)
(202) 690-7536 (office)
http://www.cdc.gov/washington

D- Scheduler appt 5 w/ Staffers

From: Davis, Angela Johnson (ATSDR/OPPE) (CTR)
Sent: Wednesday, March 21, 2007 12:52 PM
To: Rogers, Barbara A. (CDC/OD/CDCW); Fielding, Sascha (CDC/CCEHIP/NCEH)
Subject: Toxic Trailers

Hi Barbara,

Per your request in today's Issue Management meeting, please not that Patrick Edward Preston, Office of the General Counsel, Department of Homeland Security, FEMA has asked that the results of the EPA/ATSDR investigation of formaldehyde in 96 new, unoccupied trailers not be released.

/Angela

Angela Johnson Davis, PhD, CHES
Management Analyst
Quantell, INC.
NCEH/ATSDR/OPPE
Centers for Disease Control and Prevention
1600 Clifton Road MS-E-28
1825 Century Boulevard (Delivery Only)
Atlanta, GA 30345
Office: 404-498-0179
Fax: 404-498-0039
ADavis9@cdc.gov

Nickle, Richard (ATSDR/DTEM/PRMSB)

From: Frumkin, Howard (ATSDR/OA/OD)
Sent: Friday, April 06, 2007 11:25 AM
To: CDC All - NCEH/ATSDR
Cc: Falk, Henry (CDC/CCEHIP/OD); Galaska, Louise (CDC/CCEHIP/NCIPC)
Subject: Newsletter

Dear colleagues:

Greetings! Time has flown by since my last newsletter, in December. I've planned this newsletter to introduce 2007 and to look ahead to NCEH/ATSDR activities during the year, but before I knew it, we were a quarter of the way through the year. As you'll see from the pages below, there is a lot of activity to report—explaining the delay in this newsletter.

2007 PRIORITIES

When I first arrived at NCEH/ATSDR, I identified three priorities: **healthy places, preparedness,** and **excellent science**. I announced then that I hoped to work together with all of you to advance each of these priorities. I am delighted, a year and a half later, at how much progress we've made, despite budgetary and other challenges.

Healthy Places, of course, is not only one of my priorities for our Center; it is also a set of CDC Health Protection Goals. Our progress in this area has been extraordinary (see later in this newsletter). The Built Environment Working Group, led by **Andy Dannenberg**, **Ken Rose**, and other staff in our Center, with strong support from **Sharunda Buchanan**, and including members from across CDC, has an impressive track record of extramural research, publications, technical assists to state and local health agencies, innovative partnerships and collaborations, presentations at high-profile meetings, national leadership in healthy community design, and other activities. (You can see some of this work at http://www.cdc.gov/healthyplaces/.) Our Healthy Homes work is taking off under **Mary Jean Brown's** leadership, and in coordination with CDC's Healthy Homes goal team; one important milestone this year will be the release of a Surgeon General's Call for Healthy Homes, and we are providing much of the support for this important event. **Tina Forrester** is leading important efforts in Brownfields redevelopment, expanding our approach from simply interrupting toxic exposures to also achieving healthy community revitalization.

Preparedness is a key public health activity, and over the last year, our Center's work has advanced considerably. **Mike McGeehin** is leading a renewed and expanded effort to address global climate change, a looming public health challenge; we have strong support from CDC

evidence of our effectiveness and complimented the commitment ATSDR has to measuring our accountability to the public. I am very grateful to everyone in ATSDR who spent extra hours helping us prepare for this important review. Your work paid off!

ALS

The ATSDR Division of Health Studies is conducting pilot projects to evaluate the feasibility of developing a National Amyotrophic Lateral Sclerosis (ALS) Registry, based on Congressional direction. This effort will be a valuable example of data collection on neurodegenerative diseases, an increasingly important category of disease. ATSDR has had collaborative discussions with many in the ALS community, including clinicians, patient advocates, non-profit organizations, and other agencies. With the input and guidance of the collaborators, ATSDR has designed three pilot projects. The goals of these projects include the development and testing of strategies to efficiently identify ALS patients. Another goal focuses on determining how to obtain data from existing registries and/or databases within the IRB and HIPAA requirements for data sharing. We have recently briefed Congressman Eliot Engel and staff of Senators Harry Reid and Tom Harkin regarding ALS registries. Thanks to **Vik Kapil** for his very effective leadership of the ALS pilot projects.

Post-Katrina Temporary Housing

Congressman Gene Taylor wrote to Dr. Gerberding to encourage CDC to initiate an investigation of the toxic vapors released from FEMA trailers. His letter was spurred by an article entitled "Toxic Trailers" that was featured in the February 26 issue of *The Nation* and was reprinted in the (Biloxi) *Sun Herald*. The article detailed a variety of prolonged respiratory illnesses and other health problems faced by many of the Mississippi and Louisiana residents living in FEMA trailers. NCEH/ATSDR staff have collaborated to prepare a response to the Congressman. At the request of FEMA, EPA and our staff analyzed the formaldehyde levels in unoccupied FEMA emergency housing trailers. These data indicate that in trailers with closed windows, formaldehyde levels are similar to those found in new conventional housing. At this time we do not plan to conduct a health assessment of formaldehyde exposure in FEMA trailers. We have offered the Congressman practical recommendations to reduce exposures to formaldehyde in the emergency housing trailers. Thanks to **Mary Jean Brown** for coordinating with several divisions and offices to provide a timely response to Representative Taylor.

Panama MOH

On March 21st and 22nd, the Minister of Health of Panama, Dr. Camilo Alleyne, visited CDC/ATSDR. His primary purpose was to thank CDC/ATSDR for our rapid response to the outbreak of paralysis and acute renal failure linked to consumption of medication contaminated by diethylene glycol. This response was a demonstration of coordinated international efforts and an illustration of the close partnership between the U.S. and Panamanian governments. The Minister presented a lecture to NCEH/ATSDR staff, presented CDC with a Certificate of Appreciation and toured NCEH's laboratory. The Minister and his delegation also met with COGH and other CDC programs at the Roybal campus.

Endicott

In late March, the New York State Department of Health and ATSDR released the Endicott Health Statistics Review Follow-up which describes a more in-depth review of those health

Nickle, Richard (ATSDR/DTEM/PRMSB)

From: Nickle, Richard (ATSDR/DTEM/PRMSB)
Sent: Friday, May 04, 2007 10:18 AM
To: Heller, James S. (Jim) (ATSDR/DTEM/PRMSB)
Subject: FW: FEMA Release Requiring Immediate Review

Sorry, I thought you were in one of these email strings. In other emails, we had a deadline of 3 or 3:30 pm to respond to OC.

Rich Nickle
ATSDR Emergency Response

-----Original Message-----
From: Little, Joseph D. (ATSDR/DTEM/PRMSB)
Sent: Thursday, May 03, 2007 2:38 PM
To: Olivares, Dagny (ATSDR/OC); Nickle, Richard (ATSDR/DTEM/PRMSB); Cseh, Larry (ATSDR/DTEM/PRMSB); 'rwilliams@cdc.gov'; Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Cc: Keim, Mark (CDC/CCEHIP/NCEH)
Subject: RE: FEMA Release Requiring Immediate Review

Dagny,

I have reviewed the news release and concur with the content. -

Joseph Little

-----Original Message-----
From: Olivares, Dagny (ATSDR/OC)
Sent: Thursday, May 03, 2007 2:24 PM
To: Nickle, Richard (ATSDR/DTEM/PRMSB); Little, Joseph D. (ATSDR/DTEM/PRMSB); Cseh, Larry (ATSDR/DTEM/PRMSB); 'rwilliams@cdc.gov'; Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Subject: FEMA Release Requiring Immediate Review
Importance: High

Hello.

Per Mark Keim's suggestion, I am emailing you with a request from FEMA that we review the below news release this afternoon. This is simply a courtesy review as they will send the release to the media by COB whether we respond or not. In these cases we usually review for scientific accuracy but allow for their preferences in grammar and style.

Thank you.

Dagny

-----Original Message-----
From: Burden, Bernadette (CDC/OD/OEC)
Sent: Thursday, May 03, 2007 12:43 PM
To: Olivares, Dagny (ATSDR/OC)
Cc: Telfer, Jana L. (CDC/CCEHIP/NCEH); Green, Charles <<image001.png>>
<<image002.jpg>> (ATSDR/OC)
Subject: Fw: FormaldehyDRAFTNewsRelease5-3-07a (2).doc

Dagny, see email below. Andre needs ATSDR staff to review this news release today. They wanto to issue this this afternoon. We need a ver fasty review clear. Can you get on this?? Our outlook is still down so +'ve not ben able to review. THIS IS PRIORITY.

Sent from my BlackBerry Wireless Handheld

-----Original Message-----
From: Bell, Andre (HHS/ASPA)
To: Burden, Bernadette (CDC/OD/OEC); Hunter, Karen (CDC/OD/OEC)
CC: Dreyfuss, Ira (HHS/ASPA); Hall, Bill (HHS/ASPA); Pearson, Christina (HHS/ASPA)
Sent: Thu May 03 12:21:26 2007
Subject: FormaldehyDRAFTNewsRelease5-3-07a (2).doc

Karen/Bernadette- Could you please forward this FEMA release to ATSDR for review? The release references ATSDR's research on formaldehyde. FEMA is requesting to issue this release sometime today so we ask that you please turn this around as quickly as possible. thx

---

Contact: FEMA Public Affairs

202-646-4600

Date: May xx, 2007

DRAFT

Last Modified: 05-03-2007 11:00 am

News Release

FEMA STUDY: VENTILATING TRAVEL TRAILERS CAN SIGNIFICANTLY REDUCE FORMALDEHYDE EMISSION LEVELS

WASHINGTON – The Department of Homeland Security's Federal Emergency Management Agency (FEMA) said today that its study of air samples collected from travel trailers in the Gulf shows that formaldehyde emission levels in the units can be significantly reduced through adequate ventilation.

FEMA initiated the study in response to concerns expressed about formaldehyde in the trailers and because of the high number of the units used as temporary housing following hurricanes Katrina and Rita. The objective of the study was to validate the most effective measures for lowering formaldehyde concentrations in travel trailers.

Formaldehyde is a common substance that is found in homes and buildings everywhere. It is released into the air from many household products, new permanent pressed clothing, tobacco products and cigarette smoke and construction materials as well as other sources. The most significant sources of formaldehyde in travel trailers are the pressed wood products used in flooring, cabinetry and wallboard.

The study involved collecting air samples from 96 new, unused travel trailers from Sept. 19 to Oct. 7, 2006, at a staging area in Baton Rouge, La. Only previously unoccupied trailers were tested in order to eliminate any effects from human activities that might cause formaldehyde levels to rise and the units tested had been closed for approximately six weeks before the sampling,

The baseline for concentrations of formaldehyde in the units averaged 1.2 ppm (parts per million) at the beginning of the test and samples were collected from two different groups of trailers each using a different method of ventilation. One group was ventilated by opening windows and vents, while for the second group, ventilation was provided using the air conditioning system with open static vents in the bathroom. Samples were taken at different times of the day. Ambient outdoor samples also were taken concurrently with the collection of the samples in the trailers.

According to the Department of Health and Human Services' Agency for Toxic Substances and Disease Registry (ATSDR), the average concentration of formaldehyde per day in the units using open window ventilation dropped below 0.3 ppm after four days of ventilation and remained low for the rest of the test period. Average, per-day levels in the test group of trailers

using air conditioning only with one open static vent in the bathroom, remained above 0.3 ppm for all but two days of the test period. The level for health concerns for sensitive individuals was referenced by ATSDR at 0.3 ppm and above.

Early Steps Taken

In early 2006, FEMA established procedures for replacing units if the occupants were experiencing problems because of heightened sensitivity to formaldehyde. Out of more than 110,000 travel trailers used as temporary housing in the Gulf, approximately 70 had been replaced by the end of last year because of formaldehyde concerns – 20 in Louisiana and 50 in Mississippi.

The study design and testing project planning was initiated in July 2006.

Also in July 2006, FEMA distributed information to trailer occupants across the Gulf Coast explaining how those persons sensitive to formaldehyde may be affected by its presence and spelling out specific actions that should be taken to ventilate the units. The advice, which was validated by the study, involved urging occupants to take the following steps:

§ Increase ventilation. Open the windows and door of the trailer and use fans to force stale air out and bring fresh air in.

§ Keep indoor temperatures cool. Heat does cause formaldehyde to increase the rate at which it releases fumes, so, after the trailer is well ventilated, keep temperatures cooler with air conditioning,.

§ Keep the humidity low. Like heat, humidity causes formaldehyde to release fumes, so keep the relative humidity in the trailer at about 40 to 50 percent.

§ Do not smoke inside. Tobacco smoking releases formaldehyde and other toxic chemicals.

The brochures are being updated to recommend that occupants ventilate trailers thoroughly if they have been closed up for several days.

Based on the findings of the study, FEMA is moving forward with the following:

§ Establishing procedures for ventilating units currently in inventory;

§ Strengthening training for employees and contractors concerning the presence of formaldehyde and methods of reducing levels in travel trailers and park models;

§ Updating and standardizing communications to occupants regarding the presence of and methods for reducing formaldehyde in temporary housing units;

§ Formalizing procedures for responding to formaldehyde complaints from occupants of travel trailers.

§ Working with manufacturers to reduce formaldehyde emitting materials in FEMA purchased units.

FEMA began working early in 2006 to identify ways to reduce formaldehyde levels in travel trailers. The intent of the study was to validate the most effective method for reducing the level of formaldehyde concentration in travel trailers. The security and safety of all the residents of travel trailers deployed in the Gulf Coast states is of paramount importance to the agency.

###

FEMA

FEMA Study: Ventilating Travel Trailers Can Significantly Reduce Formaldehyde Emission Levels

Release Date: May 4, 2007
Release Number: HQ-07-061

» En Español

WASHINGTON, D.C. -- The Department of Homeland Security's Federal Emergency Management Agency (FEMA) said today that its study of air samples collected from travel trailers in the Gulf shows that formaldehyde emission levels in the units can be significantly reduced through adequate ventilation.

FEMA initiated the study in response to concerns expressed about formaldehyde in the trailers and because of the high number of the units used as temporary housing following hurricanes Katrina and Rita. The objective of the study was to validate the most effective measures for lowering formaldehyde concentrations in travel trailers.

Formaldehyde is a common substance that is found in homes and buildings everywhere. It is released into the air from many household products, new permanent pressed clothing, tobacco products and cigarette smoke and construction materials as well as other sources. The most significant sources of formaldehyde in travel trailers are the pressed wood products used in flooring, cabinetry and wallboard.

The study involved collecting air samples from 96 new, unused travel trailers from Sept. 19 to Oct. 7, 2006, at a staging area in Baton Rouge, La. Only previously unoccupied trailers were tested in order to eliminate any effects from human activities that might cause formaldehyde levels to rise. The units tested had been closed for approximately six weeks before the sampling. The air sampling data was analyzed for FEMA by the Department of Health and Human Services' Agency for Toxic Substances and Disease Registry (ATSDR) in Atlanta, Ga.

The baseline for concentrations of formaldehyde in the units averaged 1.2 ppm (parts per million) at the beginning of the test. Samples were collected from two different groups of trailers, each using a different method of ventilation. One group was ventilated by opening windows and vents, while for the second group, ventilation was provided using the air conditioning system with open static vents in the bathroom. Samples were taken at different times of the day. Ambient outdoor samples also were taken concurrently with the collection of the samples in the trailers.

According to the evaluation report provided to FEMA by ATSDR, the average concentration of formaldehyde per day in the units using open window ventilation dropped below 0.3 ppm after four days of ventilation and remained low for the rest of the test period. Average, per-day levels in the test

group of trailers using air conditioning only with one open static vent in the bathroom remained above 0.3 ppm for all but two days of the test period. The level for health concerns for sensitive individuals was referenced by ATSDR at 0.3 ppm and above.

Early Steps Taken

In early 2006, FEMA established procedures for replacing units if the occupants were experiencing problems because of heightened sensitivity to formaldehyde. Out of more than 110,000 travel trailers used as temporary housing in the Gulf, approximately 70 had been replaced by the end of last year because of formaldehyde concerns □ 20 in Louisiana and 50 in Mississippi.

Study design and testing project planning were initiated in July 2006.

Also in July 2006, FEMA distributed information to trailer occupants across the Gulf Coast explaining how those persons sensitive to formaldehyde may be affected by its presence and spelling out specific actions that should be taken to ventilate the units. The advice, which was validated by the study, involved urging occupants to take the following steps:

- ***Increase ventilation***. Open the windows and door of the trailer and use fans to force stale air out and bring fresh air in.
- ***Keep indoor temperatures cool.*** Heat does cause formaldehyde to increase the rate at which it releases fumes, so, after the trailer is well ventilated, keep temperatures cooler with air conditioning,.
- ***Keep the humidity low***. Like heat, humidity causes formaldehyde to release fumes, so keep the relative humidity in the trailer at about 40 to 50 percent.
- ***Do not smoke inside.*** Tobacco smoking releases formaldehyde and other toxic chemicals.

The brochures are being updated to recommend that occupants ventilate trailers thoroughly if they have been closed up for several days.

Based on the findings of the study, FEMA is moving forward with the following:

- Establishing procedures for ventilating units currently in inventory;
- Strengthening training for employees and contractors concerning the presence of formaldehyde and methods of reducing levels in travel trailers and park models;
- Updating and standardizing communications to occupants regarding the presence of and methods for reducing formaldehyde in temporary housing units;
- Formalizing procedures for responding to formaldehyde complaints from travel trailer occupants; and
- Working with manufacturers to reduce formaldehyde emitting materials in FEMA-purchased units.

The security and safety of all the residents of travel trailers deployed in the Gulf Coast states is of paramount importance to the agency. FEMA began working early in 2006 to identify ways to reduce formaldehyde levels in travel trailers. The intent of the study was to validate the most effective method for reducing the level of formaldehyde concentration in travel trailers.

The Federal Emergency Management Agency *coordinates the federal government□s role in preparing for, preventing, mitigating the effects of, responding to and recovering from all domestic disasters, whether natural or man-made, including acts of terror.*

The Agency for Toxic Substances and Disease Registry (ATSDR)*, based in Atlanta, Georgia, is a federal public health agency of the* ***U.S. Department of Health and Human Services****. ATSDR serves the public by using the best science, taking responsive public health actions, and providing trusted health information to prevent harmful exposures and diseases related to toxic substances.*

mia2@cdc.gov

From: Olivares, Dagny (ATSDR/OC)
Sent: Thursday, May 17, 2007 4:51 PM
To: Keim, Mark (CDC/CCEHIP/NCEH); Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Cc: Burden, Bernadette (CDC/OD/OEC)
Subject: Formaldehyde and FEMA Trailers
Importance: High

We are receiving media requests about CDC's response to increases in respiratory problems among persons living in FEMA trailers, including an urgent request from CBS Evening News. To our knowledge, we have received no requests from FEMA or state/local authorities and therefore have not undertaken any kind of health assessment. Before responding we wanted to confirm with you that this is the latest status.

Thank you.

Dagny E. (Putman) Olivares
Emergency Communications Specialist
National Center for Environmental Health/ Agency for Toxic Substances and Disease Prevention Centers for Disease Control and Prevention 404-498-0250

Keep the humidity low. Like heat, humidity causes formaldehyde to release fumes, so keep the relative humidity in the trailer at about 40 to 50 percent.
Do not smoke inside. Tobacco smoking releases formaldehyde and other toxic chemicals.
The brochures are being updated to recommend that occupants ventilate trailers thoroughly if they have been closed up for several days.

Jana

-----Original Message-----
From: Cibulas, William (ATSDR/DHAC/OD)
Sent: Monday, May 21, 2007 10:14 AM
To: Meiburg, Stanley (CDC/CCEHIP/NCEH); Fielding, Sascha (CDC/CCEHIP/NCEH); Telfer, Jana L. (CDC/CCEHIP/NCEH); Rose, Kenneth (ATSDR/OPPE)
Cc: McGeehin, Mike (CDC/CCEHIP/NCEH)
Subject: RE: CBS News report on FEMA trailers & formaldehyde concerns (follow up)

Stan and others,

Thanks for sharing the attached information. Does anyone have a copy of the two-week old FEMA report referenced? Has the letter to Congressman Taylor been finalized for Julie's signature?

Bill

-----Original Message-----
From: Meiburg, Stanley (CDC/CCEHIP/NCEH)
Sent: Monday, May 21, 2007 9:50 AM
To: Fielding, Sascha (CDC/CCEHIP/NCEH); Telfer, Jana L. (CDC/CCEHIP/NCEH); Rose, Kenneth (ATSDR/OPPE)
Cc: Cibulas, William (ATSDR/DHAC/OD); McGeehin, Mike (CDC/CCEHIP/NCEH)
Subject: FW: CBS News report on FEMA trailers & formaldehyde concerns (follow up)

FYI per discussion this morning at Issues Management.

Stan

-----Original Message-----
From: Mitchell.Ken@epamail.epa.gov [mailto:Mitchell.Ken@epamail.epa.gov]
Sent: Monday, May 21, 2007 9:25 AM
To: Baldridge.Ellen@epamail.epa.gov
Cc: Guinnup.Dave@epamail.epa.gov; Murphy.Deirdre@epamail.epa.gov; Smith.Roy@epamail.epa.gov; Pollard.Solomon@epamail.epa.gov; Louis.Egide@epamail.epa.gov; Hitchcock.Shane@epamail.epa.gov;

Holler, James S. (Jim) (ATSDR/DTEM/PRMSB)

From: Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Sent: Monday, May 21, 2007 12:26 PM
To: Holler, James S. (Jim) (ATSDR/DTEM/PRMSB); Nickle, Richard (ATSDR/DTEM/PRMSB)
Subject: FW: CBS News report on FEMA trailers & formaldehyde concerns (follow up)

FYI

Mike

-----Original Message-----
From: Telfer, Jana L. (CDC/CCEHIP/NCEH)
Sent: Monday, May 21, 2007 11:40 AM
To: Cibulas, William (ATSDR/DHAC/OD); Meiburg, Stanley (CDC/CCEHIP/NCEH); Fielding, Sascha (CDC/CCEHIP/NCEH); Rose, Kenneth (ATSDR/OPPE)
Cc: McGeehin, Mike (CDC/CCEHIP/NCEH); Frumkin, Howard (ATSDR/OA/OD); Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Subject: RE: CBS News report on FEMA trailers & formaldehyde concerns (follow up)

Colleagues,
I just spoke with the press person for FEMA, and the referenced report is the report we produced in February 2007. They evidently just released it on May 4. Links to the materials are available here:
http://www.fema.gov/media/index.shtm.

Three documents are available:
FEMA's statement
Formaldehyde Sampling Statistics, which appears to be a communication from OSHA
Formaldehyde Sampling at FEMA Temporary Housing Units, which is the report ATSDR provided on February 1, 2007

FEMA's news release, available at (http://www.fema.gov/news/newsrelease.fema?id=36010) contains the following public health recommendations:
Also in July 2006, FEMA distributed information to trailer occupants across the Gulf Coast explaining how those persons sensitive to formaldehyde may be affected by its presence and spelling out specific actions that should be taken to ventilate the units. The advice, which was validated by the study, involved urging occupants to take the following steps:

Increase ventilation. Open the windows and door of the trailer and use fans to force stale air out and bring fresh air in.
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The brochures are being updated to recommend that occupants ventilate trailers thoroughly if they have been closed up for several days.

Jana

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Sent: Monday, May 21, 2007 10:14 AM
To: Meiburg, Stanley (CDC/CCEHIP/NCEH); Fielding, Sascha (CDC/CCEHIP/NCEH); Telfer, Jana L. (CDC/CCEHIP/NCEH); Rose, Kenneth (ATSDR/OPPE)
Cc: McGeehin, Mike (CDC/CCEHIP/NCEH)
Subject: RE: CBS News report on FEMA trailers & formaldehyde concerns (follow up)

Stan and others,

Thanks for sharing the attached information. Does anyone have a copy of the two-week old FEMA report referenced? Has the letter to Congressman Taylor been finalized for Julie's signature?

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-----Original Message-----
From: Meiburg, Stanley (CDC/CCEHIP/NCEH)
Sent: Monday, May 21, 2007 9:50 AM
To: Fielding, Sascha (CDC/CCEHIP/NCEH); Telfer, Jana L. (CDC/CCEHIP/NCEH); Rose, Kenneth (ATSDR/OPPE)
Cc: Cibulas, William (ATSDR/DHAC/OD); McGeehin, Mike (CDC/CCEHIP/NCEH)
Subject: FW: CBS News report on FEMA trailers & formaldehyde concerns (follow up)

FYI per discussion this morning at Issues Management.

Stan

-----Original Message-----
From: Mitchell.Ken@epamail.epa.gov [mailto:Mitchell.Ken@epamail.epa.gov]
Sent: Monday, May 21, 2007 9:25 AM
To: Baldridge.Ellen@epamail.epa.gov
Cc: Guinnup.Dave@epamail.epa.gov; Murphy.Deirdre@epamail.epa.gov; Smith.Roy@epamail.epa.gov; Pollard.Solomon@epamail.epa.gov; Louis.Egide@epamail.epa.gov; Hitchcock.Shane@epamail.epa.gov; Shrieves.Van@epamail.epa.gov; Meiburg, Stanley (CDC/CCEHIP/NCEH); Yurk.Jeffrey@epamail.epa.gov; Slack.Henry@epamail.epa.gov; Terry.Carl@epamail.epa.gov; Wise.Allison@epamail.epa.gov; Dinan.Janine@epamail.epa.gov; Neeley.Doug@epamail.epa.gov
Subject: Fw: CBS News report on FEMA trailers & formaldehyde concerns (follow up)

Ellen....please see below. I'm also sending this to Stan Meiburg at ATSDR and my Region 6 contact, Jeff Yurk, since, as I recall, Region 6 was responsible for taking samples of indoor air in FEMA trailers and ATSDR was responsible for reviewing the results.

Kenneth L. Mitchell, Ph.D.
Acting Deputy Division Director
Air, Pesticides, and Toxics Management Division U.S. Environmental Protection Agency
61 Forsyth Street, SW
Atlanta, GA 30303
404-562-9065 (voice)
404-562-9066 (fax)
mitchell.ken@epa.gov

----- Forwarded by Ken Mitchell/R4/USEPA/US on 05/21/2007 09:20 AM -----

Henry Slack/R4/USEPA/US		
05/21/2007 08:10 AM	To	Ken Mitchell/R4/USEPA/US@EPA, Doug Neeley/R4/USEPA/US@EPA, Todd Rinck/R4/USEPA/US@EPA, Carol Kemker/R4/USEPA/US@EPA, Beverly Banister/R4/USEPA/US@EPA, Carl Terry/R4/USEPA/US@EPA, Laura Niles/R4/USEPA/US@EPA, Dawn Harris-Young/R4/USEPA/US@EPA
	cc	

GENE TAYLOR
4TH DISTRICT, MISSISSIPPI

COMMITTEE ON ARMED SERVICES

CHAIRMAN
SUBCOMMITTEE ON SEAPOWER AND EXPEDITIONARY FORCES

COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE

http://www.house.gov/genetaylor

Congress of the United States
House of Representatives
Washington, DC 20515–2404

February 22, 2007

2235 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515-2404
(202) 225-5772
FAX: (202) 225-7074

DISTRICT OFFICES:
2428 13rd STREET
GULFPORT, MS 39501
(228) 864-7670

701 MAIN STREET
SUITE 216
HATTIESBURG, MS 39401
(601) 582-3248

2600 GOVERNMENT STREET, SUITE B
OCEAN SPRINGS, MS 39564
(228) 872-7960

527 CENTRAL AVENUE
LAUREL, MS 39440
(601) 425-3905

Julie Louise Gerberding, M.D., M.P.H.
Director
Centers for Disease Control
1600 Clifton Road, N.E.
Atlanta, GA 30333

Dear Dr. Gerberding:

Enclosed please find a copy of an article in the February 26 issue of *The Nation*, entitled "Toxic Trailers," as reprinted in the (Biloxi) *Sun Herald*.

The article describes respiratory illness and other health problems suffered by residents of FEMA trailers in Mississippi and Louisiana. Several health experts expressed the opinion that formaldehyde emissions from the wood products in the trailers are responsible for the illness among trailer residents.

I urge you to initiate a detailed investigation by the Centers for Disease Control. According to the article, FEMA, OSHA, EPA, and the Mississippi Department of Health have looked into the concerns, but each questions its authority to conduct a substantive investigation. CDC should be the appropriate agency to fully investigate whether formaldehyde in the FEMA trailers has caused an outbreak of respiratory illness.

If you need any action by Congress or by the affected states, please let me know immediately and I will do all I can to make it happen.

Thank you for your immediate attention to this request. If you have any questions, please contact Brian Martin in my office at (202) 225-5772.

Sincerely,

GENE TAYLOR
Member of Congress

GT:jbm

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
and Prevention (CDC)
Atlanta GA 30333

MAY 30 2007

MAY 29 2007

The Honorable Gene Taylor
House of Representatives
Washington, D.C. 20515-2404

Dear Mr. Taylor:

Thank you for your letter regarding the health problems reported by Mississippi and Louisiana residents concerning Federal Emergency Management Agency (FEMA) trailers in those states and your request that the Centers for Disease Control and Prevention (CDC) conduct a health investigation of formaldehyde exposure to people living in FEMA trailers. CDC shares your concern about those affected by Hurricane Katrina.

CDC and the National Center for Environmental Health/Agency for Toxic Substances and Disease Registry (NCEH/ATSDR), in collaboration with the U.S. Environmental Protection Agency (EPA) and at the request of FEMA, have found levels of formaldehyde in closed trailers to cause irritation to the eyes, nose, and/or throat. For nonsensitized persons, symptoms are likely to be transient; however, long-term effects are not known. In addition to analyzing formaldehyde levels in closed FEMA trailers, NCEH/ATSDR is providing support to Mississippi and Louisiana State Health Departments to conduct epidemiologic studies on exposures from the trailers.

CDC recognizes that residents experiencing symptoms want and need to alleviate their discomfort. They can do so by reducing their total exposure to formaldehyde. Residents can protect themselves by increasing the exchange rate of indoor air with fresh outdoor air in their homes (i.e., keeping their windows open or operating their air conditioners in an exhaust mode as opposed to a circulate mode). They can also avoid certain products and activities likely to increase formaldehyde levels. For instance, they can avoid using products that contain formaldehyde such as dry cleaning fluids and some household cleaners, paints, varnishes, and vinyls. They can also avoid cigarette smoke which is known to contain formaldehyde. In addition, residents should avoid using kerosene heaters which can increase formaldehyde levels. Furthermore, wood products such as plywood and particle board should be sealed with vinyl paint that does not contain formaldehyde.

CDC has contacted FEMA, EPA, the Department of Housing and Urban Development (HUD), and the Department of Transportation (DOT) regarding your request. EPA is responsible for regulating formaldehyde as a hazardous air pollutant. HUD is responsible for regulating formaldehyde levels in manufactured housing and other prefabricated dwellings, excluding travel trailers. DOT is responsible for regulating mobile homes under 49 CFR, Part 571, "Federal Motor Vehicle Safety Standard."

Enclosed is supplemental scientific-related information about formaldehyde (Tab A). This information is provided to demonstrate the state of our science regarding this issue. An ATSDR fact sheet which answers frequently asked questions about formaldehyde exposure is also enclosed (Tab B). For more information about the health effects of formaldehyde exposure, please access ATSDR's Toxicological Profile for formaldehyde at www.atsdr.cdc.gov/toxprofiles/tp111.html.

Formaldehyde is just one of many factors to consider related to health in the home. CDC has two related initiatives that may also be of interest to you. These initiatives focus on building healthy communities and healthy homes. Our staff members will be pleased to discuss these initiatives in greater detail upon your request.

I appreciate the opportunity to address this important public health issue and hope this information is helpful.

Sincerely,

Julie Louise Gerberding, M.D., M.P.H.
Director, Centers for Disease Control and Prevention, and
Administrator, Agency for Toxic Substances and Disease Registry

2 Enclosures

Tab A: CDC/ATSDR Science-Related Summary of Findings on Formaldehyde

Background on Formaldehyde

Formaldehyde is a colorless gas with a pungent, irritating odor. An odor threshold is reported as 0.83 ppm with a range of 0.05 to 1.0 ppm (ACGIH, 2001). Some studies of people exposed to formaldehyde in workplace air found more cases of cancer of the nose and throat than expected, but other studies did not confirm this finding. Nonetheless, the Department of Health and Human Services (HHS) has determined that formaldehyde may reasonably be anticipated to be a human carcinogen on the basis of limited evidence in humans and sufficient evidence in laboratory animals (NTP, 2005). The U. S. Environmental Protection Agency (EPA) and the International Agency for Research on Cancer also classify formaldehyde as a probable human carcinogen.

Adverse Health Effects of Intermediate Exposure to Formaldehyde

Table 1: Acute Adverse Health Effects from the Inhalation of Formaldehyde

Exposure Level (ppm)	Reported Adverse Effects
0.05—1.0	50—70% of people tested report no effects
0.05—1.0	Odor threshold
0.05—2.0	Eye irritation
0.10—25	Upper airway irritation
5.0—30	Lower airway and pulmonary effects
50—100	Pulmonary edema, inflammation, pneumonia
>100	Death

From National Research Council, Committee on Aldehydes: Formaldehydes and Other Aldehydes. 1981, National Academy Press, Washington D.C.

Inhalation exposure of months to one year or longer is expected to increase the incidence of symptoms of upper respiratory tract and eye irritation (ATSDR, 1999).

Formaldehyde is found in low levels in homes, offices, and the urban environments. Mobile homes are a potential source of relatively high formaldehyde exposures because they are typically constructed of large quantities of particle board bonded with formaldehyde resins. Mobile homes also have lower outdoor air exchange rates than conventionally built housing which leads to an accumulation of free formaldehyde in living spaces (Stenton, 1994). Ritchie and Lehnen conducted a study of 2000 individuals living in mobile and conventional homes and

found that occupants complained of nose and throat irritation, headache, and rashes at exposures of ≥ 0.1 ppm (Ritchie, 1987). Further information on the health effects of formaldehyde exposure can be found in the Toxicological Profile for formaldehyde available at www.atsdr.cdc.gov/toxprofiles/tp111.html.

Levels of Formaldehyde in "worst case" Unoccupied, Closed Trailers

CDC and ATSDR, in collaboration with EPA and at the request of the Federal Emergency Management Association (FEMA), have reviewed the formaldehyde levels from tests of 96 unoccupied FEMA emergency-housing trailers. The available data suggest that in closed trailers, the average formaldehyde level of 1.1 ppm dropped to below 0.14 ppm when maximum ventilation was used, including opening windows and running exhaust fans. However, in trailers where ventilation was provided by running the air conditioners with only the bathroom vents open, the formaldehyde levels, on average, were reduced to 0.4 ppm. This level may be high enough to cause symptoms in people who have already become "sensitized" to formaldehyde. Although formaldehyde levels in new trailers may remain above the threshold for symptoms in sensitized people for as long as three years, nonsensitized people are unlikely to experience anything other than transient irritation. However, the long term health effects of formaldehyde exposure cannot be determined from this analysis.

References:

Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological profile for Formaldehyde. Research Triangle Institute. 1999.

American Conference of Governmental Industrial Hygienists (ACGIH). Formaldehyde: TLV® Chemical Substances 7th Edition. Cincinnati, Ohio 2001.

Ritchie IM and Lehnen RG. Formaldehyde-related complaints of residents living in mobile and conventional homes. American Journal of Public Health. 1987; 77:323-328.

Stenton SC and Hendrick DJ. Formaldehyde. Immunology and Allergy Clinics of North America. 1994; 3:635-657.

U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program (NTP). Report on Carcinogens, 11th Edition. 2005.

Tab B: ATSDR Fact Sheet "ToxFAQs™" for Formaldehyde

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

FORMALDEHYDE
CAS # 50-00-0

Agency for Toxic Substances and Disease Registry ToxFAQs | **June 1999**

This fact sheet answers the most frequently asked health questions (FAQs) about formaldehyde. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Everyone is exposed to small amounts of formaldehyde in air and some foods and products. Formaldehyde can cause irritation of the skin, eyes, nose, and throat. High levels of exposure may cause some types of cancers. This substance has been found in at least 26 of the 1,467 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is formaldehyde?
(Pronounced för-măl'də-hīd')

At room temperature, formaldehyde is a colorless, flammable gas that has a distinct, pungent smell. It is also known as methanal, methylene oxide, oxymethyline, methylaldehyde, and oxomethane. Formaldehyde is naturally produced in small amounts in our bodies.

It is used in the production of fertilizer, paper, plywood, and urea-formaldehyde resins. It is also used as a preservative in some foods and in many products used around the house, such as antiseptics, medicines, and cosmetics.

What happens to formaldehyde when it enters the environment?

- Formaldehyde dissolves easily but does not last a long time in water.
- Most formaldehyde in the air breaks down during the day.
- The breakdown products of formaldehyde are formic acid and carbon monoxide.
- Formaldehyde does not build up in plants and animals.

How might I be exposed to formaldehyde?

- Smog is a major source of formaldehyde exposure.
- Cigarettes and other tobacco products, gas cookers, and open fireplaces are sources of formaldehyde exposure.
- It is used in many industries and in hospitals and laboratories.
- Formaldehyde is given off as a gas from the manufactured wood products used in new mobile homes.
- The amount of formaldehyde in foods is very small.
- Household sources, such as fiberglass, carpets, permanent press fabrics, paper products, and some household cleaners.

How can formaldehyde affect my health?

Low levels of formaldehyde can cause irritation of the eyes, nose, throat, and skin. It is possible that people with asthma may be more sensitive to the effects of inhaled formaldehyde.

Drinking large amounts of formaldehyde can cause severe pain, vomiting, coma, and possible death.

ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html

How likely is formaldehyde to cause cancer?

Some studies of people exposed to formaldehyde in workplace air found more cases of cancer of the nose and throat than expected, but other studies did not confirm this finding.

In animal studies, rats exposed to high levels of formaldehyde in air developed nose cancer. The Department of Health and Human Services (DHHS) has determined that formaldehyde may reasonably be anticipated to be a carcinogen.

How can formaldehyde affect children?

The most common route of exposure is by breathing it, which is likely to cause nose and eye irritation (burning, itchy, tearing, and sore throat) in children as well as in adults.

Animal studies suggest that formaldhyde will not cause birth defects in humans. It is not likely to be transferred to a child in breast milk.

How can families reduce the risk of exposure to formaldehyde?

Formaldehyde is usually found in the air, and levels are usually higher indoors than outdoors. Opening windows and using fans to bring fresh air indoors are the easiest ways to lower levels in the house. Not smoking and not using unvented heaters indoors can lower the formaldehyde levels.

Removing formaldehyde sources in the home can reduce exposure. Formaldehyde is given off from a number of products used in the home. Providing fresh air, sealing unfinished manufactured wood surfaces, and washing new permanent press clothing before wearing can help lower exposure.

Is there a medical test to show whether I've been exposed to formaldehyde?

Laboratory tests can measure formaldehyde in blood, urine, and breath. These tests do not tell you how much formaldehyde you have been exposed to or if harmful effects will occur. The tests are not routinely available at your doctor's office.

What recommendations has the federal government made to protect human health?

The EPA recommends that an adult should not drink water containing more than 1 milligram of formaldehyde per liter of water (1 mg/L) for a lifetime exposure, and a child should not drink water containing more than 10 mg/L for 1 day or 5 mg/L for 10 days.

The Occupational Safety and Health Administration (OSHA) has set a permissable exposure limit for formaldehyde of 0.75 parts per million (ppm) for an 8-hour workday, 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends an exposure limit of 0.016 ppm.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for formaldehyde. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Services.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737. FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Holler, James S. (Jim) (ATSDR/DTEM/PRMSB)

From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Friday, June 01, 2007 2:02 PM
To: Holler, James S. (Jim) (ATSDR/DTEM/PRMSB); Nickle, Richard (ATSDR/DTEM/PRMSB)
Cc: Murray, Ed (ATSDR/DTEM/ATB)
Subject: FW: Formaldehyde & Kids

Christopher T. De Rosa, M.S., Ph.D.
Director, Division of Toxicology and Environmental Medicine Agency for Toxic Substances and Disease Registry 1600 Clifton Road - Mailstop F32 Atlanta, GA 30333
(770) 488-7003

-----Original Message-----
From: Frumkin, Howard (ATSDR/OA/OD)
Sent: Wednesday, May 30, 2007 7:34 PM
To: Sinks, Tom (ATSDR/OA/OD); De Rosa, Christopher (Chris) (ATSDR/DTEM/OD); 'Meiburg.Stan@epamail.epa.gov'; Deitchman, Scott (CDC/CCEHIP/NCEH); Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Subject: Fw: Formaldehyde & Kids

Dear all:
FYI.
Howie

Sent using BlackBerry

-----Original Message-----
From: Bill Ravanesi <ravanesi@comcast.net>
To: Frumkin, Howard (ATSDR/OA/OD)
Sent: Wed May 30 15:27:19 2007
Subject: Formaldehyde & Kids

Howie,

In the event you haven't seen this brief news item-ugh!

AN INSIDE LOOK AT EMERGING MARKET AND POLITICAL TRENDS
Formaldehyde & Kids: Sleep Well

by Bill Walsh, National Coordinator
Healthy Building Network

May 30, 2007

In the May 11, 2007 issue of the Healthy Building News, we reported on the California Air Resources Board (CARB) decision to severely limit allowable emissions of toxic formaldehyde gas from particle board and other composite wood building materials.

One week later, news reports documenting formaldehyde poisoning of children in the Gulf Coast region of Mississippi were being dismissed by federal officials. The source of the kids' chronic coughing, burning eyes, nose bleeds and sinus infections: those same building materials as used in trailers provided to survivors of hurricane Katrina by the Federal Emergency Management Agency (FEMA). According to news reports, FEMA Director David Paulison said he was unaware of any health risks from the trailers. "We've told people they can air those trailers out," he said, by opening windows and turning on air conditioners.

Back in March, two weeks after the state of California determined that "Exposure to low or moderate levels of formaldehyde can result in eye and upper respiratory tract irritation, headache, and rhinitis,"[1] FEMA officials reassured Congressman Henry Waxman, Chairman of the Committee on Oversight and Government Reform, that according to the federal Environmental Protection Agency (EPA) and Centers for Disease Control (CDC) there were no health risks associated with FEMA trailers.[2] But according to the EPA, formaldehyde, at levels that can be found in homes with significant amounts of pressed products, can cause "watery eyes, burning sensations in the eyes and throat, nausea, and difficulty in breathing," along with wheezing and coughing; fatigue; skin rash; severe allergic reactions and asthma attacks.

The CDC concurs and adds that "Children exposed to the same levels of formaldehyde as adults may receive larger doses because they have greater lung surface area:body weight ratios and increased minute volumes:weight ratios. In addition, they may be exposed to higher levels than adults in the same location because of their short stature and the higher levels of formaldehyde found nearer to the ground."

The health effects of formaldehyde don't stop with bronchial distress and allergic responses. The World Health Organization classifies formaldehyde as a known carcinogen.

After learning that a Mississippi pediatrician was attributing multiple cases of childhood illnesses to formaldehyde offgassing in their FEMA trailers and raising cancer concerns, CBS news tested the home of one sick child using the same equipment FEMA uses. That test found the child exposed to formaldehyde in his home at levels 70% higher than EPA's recommended exposure limits for adults in the workplace. The child has lived there for almost 2 years.

One would think that the EPA, CDC and California findings would compel action to prevent formaldehyde poisoning of children in FEMA trailers. But there is no law against knowingly and needlessly exposing children in Mississippi trailers to a human carcinogen while they sleep, two years after a hurricane took their home. This is why we need the Precautionary Principle.[3]

In the meantime - sleep well Mr. Paulison, the law's on your side.

HEALTHY BUILDING NEWS SOURCES

[1] "Proposed Airborne Toxic Control Measure To Reduce Formaldehyde Emissions From Composite Wood Products" California Air Resource Board, March 9, 2007.

[2] Letter from David Garrat, FEMA Acting Director of Recovery to Rep. Henry Waxman, March 23, 2007 p.3

[3] "When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. In this context the proponent of an activity, rather than the public, should bear the burden of proof." - Wingspread Statement on the Precautionary Principle, Jan. 1998

Bill Ravanesi MA, MPH
Boston Regional Director
Health Care Without Harm
19 Pleasantview Ave.
Longmeadow. MA 01106
413-565-2315 office
413-427-7006 cell
www.noharm.org
--

Sinks, Tom (ATSDR/OA/OD)

From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Tuesday, July 10, 2007 6:06 PM
To: Sinks, Tom (ATSDR/OA/OD); Rogers, Barbara A. (CDC/OD/CDCW); Weston, Richard C. (CDC/OD/CDCW); Rose, Kenneth (ATSDR/OPPE); Fielding, Sascha (CDC/CCEHIP/NCEH)
Subject: FW: Indoor air formaldehyde

Richard,
This is what I sent forward earlier, when this issue came up. Toluene and other VOC's are also of potential concern, both individually and as a mixture.
Chris

Christopher T. De Rosa, M.S., Ph.D.
Director, Division of Toxicology and Environmental Medicine Agency for Toxic Substances and Disease Registry 1600 Clifton Road - Mailstop F32 Atlanta, GA 30333
(770) 488-7003

-----Original Message-----
From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Friday, June 01, 2007 6:05 PM
To: Frumkin, Howard (ATSDR/OA/OD); Sinks, Tom (ATSDR/OA/OD); 'Meiburg.Stan@epamail.epa.gov'; Deitchman, Scott (CDC/CCEHIP/NCEH); Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH)
Cc: Fowler, Bruce (ATSDR/DTEM/OD); Murray, Ed (ATSDR/DTEM/ATB); Orloff, Ken L. (OIG); Osterloh, John (CDC/CCEHIP/NCEH); De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Subject: FW: Indoor air formaldehyde

Howie and et. al.,

We should be very cautious about the use of the word "safe" in reference to formaldehyde. Since it is a carcinogen it is a matter of science policy that there is no "safe" level of exposure. DHHS has classified formaldehyde as "reasonably anticipated" to be a human carcinogen." IARC has determined that formaldehyde is "probably carcinogenic to humans" while EPA has determined that formaldehyde is "a probable human carcinogen."

In addition to cancer formaldehyde has been shown to be a reproductive/developmental toxicant and is a skin sensitizer as is evidenced by the reported symptoms of the children in the trailers in Mississippi. These overt symptoms will probably trigger sensitization in some proportion to varying degrees in children.

Nevertheless, there are acute, intermediate and chronic inhalation MRL's in our toxicological profile as well as intermediate and chronic oral MRL's for non-cancer end points. Since these values have been peer and publically reviewed, I would suggest that they be used as a point of departure for any deliberative process.

Also, please note that it has been demonstrated that formaldehyde potentiates the effects of the triazide monomer found in melamine which is currently a dietary concern being addressed by FDA in consultation with a number of different agencies including CDC/NCEH and ATSDR.

To my knowledge this represents the third time that FEMA has approached NCEH/ATSDR requesting that we specify safe levels of exposure to formaldehyde. In two instances they specifically requested that we limit the scope of our response to short term exposures. Last fall, I was contacted by FEMA in region 4 requesting that I review and approve a modified version of our Toxfaqs sheet. More recently we were contacted through OPTER again requesting guidance for short term exposures only.

For these reasons we should be very cautious in making a public health call on this issue.

Chris

Christopher T. De Rosa, M.S., Ph.D.

Director, Division of Toxicology and Environmental Medicine Agency for Toxic Substances and Disease Registry 1600 Clifton Road - Mailstop F32 Atlanta, GA 30333 (770) 488-7003

-----Original Message-----
From: Murray, Ed (ATSDR/DTEM/ATB)
Sent: Friday, June 01, 2007 4:31 PM
To: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Subject: FW: Indoor air formaldehyde

fyi

Ed

-----Original Message-----
From: Fowler, Bruce (ATSDR/DTEM/OD)
Sent: Friday, June 01, 2007 2:27 PM
To: Orloff, Kenneth G. (ATSDR/DHAC/OD); Murray, Ed (ATSDR/DTEM/ATB)
Subject: Re: Indoor air formaldehyde

Hi Ken: I am sure we can help out. I am copying Ed Murray on this and will ask him to forward the name of our SME on formaldehyde to you. I will also voluinteer if needed. I thought they had stopped using the foam insulation in mobile homes long ago. Wow-lowest bidder.
Best,
Brucd

Sent from my BlackBerry Wireless Device

-----Original Message-----
From: Orloff, Kenneth G. (ATSDR/DHAC/OD)
To: Fowler, Bruce (ATSDR/DTEM/OD)
CC: Cibulas, William (ATSDR/DHAC/OD); Williams-Fleetwood, Sharon O. (ATSDR/DHAC/OD)
Sent: Fri Jun 01 14:00:13 2007
Subject: Indoor air formaldehyde

Bruce,

FEMA and the Department of Homeland Security have requested assistance from NCEH in investigating reported respiratory illness in children who are living in trailers provided by FEMA for families displaced by Hurricane Katrina. As you are probably aware, Scott Wright and Joe Little have written a health consultation that assesses the impact of various ventilation methods on indoor air levels of formaldehyde in these trailers.

As part of its investigation, NCEH has asked DHAC to recommend indoor air levels of formaldehyde that would be safe for residents of FEMA trailers (there are no EPA or federal standards). To respond to this request, I will be chairing a small ad hoc work group of toxicologists and health assessors. I would appreciate DTEM's participation in this workgroup, and I am requesting 1 or 2 DTEM staff to participate in the discussions. This is a fast-track request, and I hope to get a recommendation out in 30-days.

Please indicate if DTEM can participate.

Thanks, Ken

Wright, Scott V. (ATSDR/DTEM/PRMSB)

From:	Wright, Scott V. (ATSDR/DTEM/PRMSB)
Sent:	Friday, July 20, 2007 11:06 AM
To:	Fielding, Sascha (CDC/CCEHIP/NCEH)
Cc:	Little, Joseph D. (ATSDR/DTEM/PRMSB); Murray, Ed (ATSDR/DTEM)
Subject:	RE: IMPORTANT FEMA trailer hearing re ATSDR

ATSDR actually did not derive any number nor did it calculate any number. The Level of Concern (LOC) of 0.3 PPM seen in the ATSDR Health Consultation was based upon an Effects Level seen in the documented, peer reviewed, scientific literature. This LOC was meant to be applied only to the 96 test trailers and not as a Health Guidance Value to be applied to all FEMA trailers. This was stated consistently and repeatedly throughout the ATSDR Health Consultation. ATSDR emphatically stated in the conclusions that the levels of formaldehyde seen in trailers was of a Health Concern!

The purpose of the ATSDR consultation was to provide FEMA a clearer understanding of the issues associated with formaldehyde in temporary housing units. The consultation was not intended to establish FEMA's future policy concerning temporary housing units. The conclusions derived from the sampling of the 96 trailers are for those trailers only, and are not necessarily applicable to all other trailers due to numerous variables for which appropriate data and information are not available.

Persons who are sensitized to formaldehyde may experience headaches, and minor eye and airway irritation at levels below the odor threshold of 0.5 to 1.0 ppm (615 – 1230 ug/m3). Some sensitive individuals may experience asthma-like symptoms, and dermatitis, even at very low doses [1]. Previously sensitized individuals can develop severe narrowing of the bronchi at very low concentrations such as 0.3 ppm (369 ug/m3). Bronchial narrowing may begin immediately, or can be delayed for 3 to 4 hours. Effects may worsen for up to 20 hours after exposure and can persist for several days [1]. The Threshold Limit Value (TLV), Short-term Exposure Limit (STEL) recommended by the American Conference of Government Industrial Hygienists (ACGIH) is also 0.3 ppm (369 ug/m3).

Populations of humans that have received considerable attention in the literature as being particularly sensitive to formaldehyde exposure following inhalation and/or dermal contact include asthmatics and persons with dermal sensitization. The concerns involving asthmatics focuses on the potential changes in lung function parameters that formaldehyde may produce. Studies involving asthmatics have been somewhat conflicting, but generally indicate that formaldehyde does not induce airway hyper-reactivity at concentrations less than 3 ppm (3690 ug/m3) [2]. Symptoms of increased itching, sneezing, mucosal congestion, and transient burning sensation of the eyes and the nasal passages, were observed in a group of potentially sensitive individuals, some with dermal hypersensitivity, exposed to formaldehyde at a concentration of 0.4 ppm (492 ug/m3) for a period of 2 hours (Pazdrak et al. 1993) [2].

References:

1. Agency for Toxic Substances and Disease Registry, Managing Hazardous Materials Incidents, Medical Management Guidelines for Acute Chemical Exposures, Formaldehyde. Atlanta, ATSDR, 2001.

2. Agency for Toxic Substances and Disease Registry, Toxicological Profile for Formaldehyde. Atlanta, ATSDR, July 1999.

scott

-----Original Message-----
From: Fielding, Sascha (CDC/CCEHIP/NCEH)
Sent: Friday, July 20, 2007 10:21 AM
To: Wright, Scott V. (ATSDR/DTEM/PRMSB); McGeehin, Mike
Cc: Murray, Ed (ATSDR/DTEM); Little, Joseph D. (ATSDR/DTEM/PRMSB); Frumkin, Howard (ATSDR/OA/OD); Falk, Henry (CDC/CCEHIP/OD)
Subject: RE: IMPORTANT FEMA trailer hearing re ATSDR

Wright, Scott V. (ATSDR/DTEM/PRMSB)

From: Fielding, Sascha (CDC/CCEHIP/NCEH)
Sent: Friday, July 20, 2007 1:35 PM
To: Holler, James S. (Jim) (ATSDR/DTEM/PRMSB); Wright, Scott V. (ATSDR/DTEM/PRMSB)
Subject: FW: IMPORTANT FEMA trailer hearing re ATSDR

-----Original Message-----
From: Frumkin, Howard (ATSDR/OA/OD)
Sent: Friday, July 20, 2007 11:18 AM
To: Fielding, Sascha (CDC/CCEHIP/NCEH); McGeehin, Mike (CDC/CCEHIP/NCEH); Cibulas, William (ATSDR/DHAC/OD); Falk, Henry (CDC/CCEHIP/OD)
Cc: Olivares, Dagny (ATSDR/OC)
Subject: Re: IMPORTANT FEMA trailer hearing re ATSDR

OK, if I understand this correctly the "level of concern" has little or no operational meaning. One wonders why it was ever announced! I'm not sure we need to retract it, but I think we DO need a statement that speaks to the possibility of health effects at various low levels. I think FEMA and the public both expect guidance from us as to what is safe and how to approach symptoms. Mike, as the lead on this, how about drafting key points today, which (once we agree) we can provide to JLG and to FEMA (and have available for public statements if needed).

Howard Frumkin, M.D., Dr.P.H., Director
National Center for Environmental Health / Agency for Toxic Substances and Disease Registry U.S. Centers for Disease Control and Prevention 1600 Clifton Rd., NE, MS E-28 Atlanta GA 30333 Tel 404-498-0004 Fax 404-498-0083 E-mail haf6@cdc.gov

---Original Message-----
From: Fielding, Sascha (CDC/CCEHIP/NCEH)
To: McGeehin, Mike (CDC/CCEHIP/NCEH); Cibulas, William (ATSDR/DHAC/OD); Frumkin, Howard (ATSDR/OA/OD)
CC: Olivares, Dagny (ATSDR/OC)
Sent: Fri Jul 20 11:08:01 2007
Subject: FW: IMPORTANT FEMA trailer hearing re ATSDR

This is what I just received from Scott.

-----Original Message-----
From: Wright, Scott V. (ATSDR/DTEM/PRMSB)
Sent: Friday, July 20, 2007 11:06 AM
To: Fielding, Sascha (CDC/CCEHIP/NCEH)
Cc: Little, Joseph D. (ATSDR/DTEM/PRMSB); Murray, Ed (ATSDR/DTEM)
Subject: RE: IMPORTANT FEMA trailer hearing re ATSDR

ATSDR actually did not derive any number nor did it calculate any number. The Level of Concern (LOC) of 0.3 PPM seen in the ATSDR Health Consultation was based upon an Effects Level seen in the documented, peer reviewed, scientific literature. This LOC was meant to be applied only to the 96 test trailers and not as a Health Guidance Value to be applied to all FEMA trailers. This was stated consistently and repeatedly throughout the ATSDR Health Consultation. ATSDR emphatically stated in the conclusions that the levels of formaldehyde seen in trailers was of a Health Concern!

The purpose of the ATSDR consultation was to provide FEMA a clearer understanding of the issues associated with formaldehyde in temporary housing units. The consultation was not intended to establish FEMA's future policy concerning temporary housing units. The conclusions derived from the sampling of the 96 trailers are for those trailers only, and are not necessarily applicable to all other trailers due to numerous variables for which appropriate data and information are not available.

Wright, Scott V. (ATSDR/DTEM/PRMSB)

From: Falk, Henry (CDC/CCEHIP/OD)
Sent: Friday, July 20, 2007 2:42 PM
To: Fielding, Sascha (CDC/CCEHIP/NCEH); McGeehin, Mike (CDC/CCEHIP/NCEH); Frumkin, Howard (ATSDR/OA/OD); Cibulas, William (ATSDR/DHAC/OD); Murray, Ed (ATSDR/DTEM)
Cc: Wright, Scott V. (ATSDR/DTEM/PRMSB); Holler, James S. (Jim) (ATSDR/DTEM/PRMSB); Olivares, Dagny (ATSDR/OC); Vatave, Ajay (CDC/CCHP/NCBDDD); Rogers, Barbara A. (CDC/OD/CDCW); Telfer, Jana L. (CDC/CCEHIP/NCEH); Rose, Kenneth (ATSDR/OPPE)
Subject: RE: DRAFT FEMA Talking Points

I think the first 2 bullets are not as sharp as could be, as we don't explicitly define "health concern" or why these 96 trailers should be different than any others. I would recommend saying something like the following: that for the FEMA test trailers we specifically for the purpose of that single evaluation used a number which is at (or just below) the level which is known/likely/capable of causing acute symptoms. Since a number of trailers were above that number it was clear that the trailers could cause symptoms if they were occupied. This 0.3ppm level was never intended to be a safe level for long-term exposure and the prevention of potential chronic effects and was not meant to be a safe level for long term occupance of the trailers. And I assume if anyone asks why we used the 0.3 number it's because symptoms were being reported in FEMA trailers and we were trying to ascertain if that was plausible based on the numbers, and the answer was yes.

From: Fielding, Sascha (CDC/CCEHIP/NCEH)
Sent: Friday, July 20, 2007 1:43 PM
To: McGeehin, Mike (CDC/CCEHIP/NCEH); Frumkin, Howard (ATSDR/OA/OD); Falk, Henry (CDC/CCEHIP/OD); Cibulas, William (ATSDR/DHAC/OD); Murray, Ed (ATSDR/DTEM)
Cc: Wright, Scott V. (ATSDR/DTEM/PRMSB); Holler, James S. (Jim) (ATSDR/DTEM/PRMSB); Olivares, Dagny (ATSDR/OC); Vatave, Ajay (CDC/CCHP/NCBDDD); Rogers, Barbara A. (CDC/OD/CDCW); Telfer, Jana L. (CDC/CCEHIP/NCEH); Rose, Kenneth (ATSDR/OPPE)
Subject: DRAFT FEMA Talking Points
Importance: High

'ease review these draft talking points:

ATSDR's report unequivocally concluded that the levels of formaldehyde seen in the test trailers were a health concern.

- ATSDR used a measure of 0.3 PPM of formaldehyde as an indicator to determine if the levels of formaldehyde observed in the 96 test trailers were of concern.
- This level of concern was intended solely for testing purposes and was applied only to this study of the 96 test trailers.
- Throughout the report, ATSDR clearly and repeatedly advised that 0.3 PPM should not be used as a minimum standard for all FEMA trailers.

ATSDR's study did not address long-term formaldehyde in trailers or health concerns related to potential exposures.

- ATSDR's consultation was designed to provide FEMA a clearer understanding of the issues associated with formaldehyde in temporary housing units.
- The consultation was not intended to establish FEMA's future policy concerning temporary housing units.
- The report's conclusions are not necessarily applicable to trailers other than the 96 test trailers examined in this study.

On Monday, July 23, CDC scientists will travel to the Gulf Coast to begin a new study of the FEMA trailers.

- The new CDC study will address the possible association between poor indoor air quality in the travel trailers and adverse health effects in children who live in them.
- CDC will test actual air quality conditions in travel trailers when they are used for prolonged periods of time under real-life conditions.
- CDC will conduct thorough indoor environmental assessments collected over time along with interviews and observations of trailer residents, including children, and will focus on broader indoor air quality issues and exposures.

Previous studies have linked low levels of formaldehyde to negative health outcomes.

- Low levels of formaldehyde can cause irritation of the eyes, nose, throat, and skin.

Wright, Scott V. (ATSDR/DTEM/PRMSB)

From: Frumkin, Howard (ATSDR/OA/OD)
Sent: Friday, July 20, 2007 3:33 PM
To: Fielding, Sascha (CDC/CCEHIP/NCEH); McGeehin, Mike (CDC/CCEHIP/NCEH); Falk, Henry (CDC/CCEHIP/OD); Cibulas, William (ATSDR/DHAC/OD); Murray, Ed (ATSDR/DTEM)
Cc: Wright, Scott V. (ATSDR/DTEM/PRMSB); Holler, James S. (Jim) (ATSDR/DTEM/PRMSB); Olivares, Dagny (ATSDR/OC); Vatave, Ajay (CDC/CCHP/NCBDDD); Rogers, Barbara A. (CDC/OD/CDCW); Telfer, Jana L. (CDC/CCEHIP/NCEH); Rose, Kenneth (ATSDR/OPPE)
Subject: Re: DRAFT FEMA Talking Points

This is a great start. Comments:
1. Much too defensive. The purpose isn't to excuse or defend what we did, as the first few bullets seem to do. The purpose is to clarify and inform regarding health issues associated with formaldehyde.
2. Needs fewer bullets for greater comprehensibility, with key points up front.
3. more...but its taking so long on Blackberry that I'll call.
Howie

Howard Frumkin, M.D., Dr.P.H., Director
National Center for Environmental Health / Agency for Toxic Substances and Disease Registry U.S. Centers for Disease Control and Prevention 1600 Clifton Rd., NE, MS E-28
Atlanta GA 30333 Tel 404-498-0004 Fax 404-498-0083 E-mail haf6@cdc.gov

-----Original Message-----
From: Fielding, Sascha (CDC/CCEHIP/NCEH)
To: McGeehin, Mike (CDC/CCEHIP/NCEH); Frumkin, Howard (ATSDR/OA/OD); Falk, Henry (CDC/CCEHIP/OD); Cibulas, William (ATSDR/DHAC/OD); Murray, Ed (ATSDR/DTEM)
CC: Wright, Scott V. (ATSDR/DTEM/PRMSB); Holler, James S. (Jim) (ATSDR/DTEM/PRMSB); Olivares, Dagny (ATSDR/OC); Vatave, Ajay (CDC/CCHP/NCBDDD); Rogers, Barbara A. (CDC/OD/CDCW); Telfer, Jana L. (CDC/CCEHIP/NCEH); Rose, Kenneth (ATSDR/OPPE)
Sent: Fri Jul 20 13:43:23 2007
Subject: DRAFT FEMA Talking Points

Please review these draft talking points:

ATSDR's report unequivocally concluded that the levels of formaldehyde seen in the test trailers were a health concern.
* ATSDR used a measure of 0.3 PPM of formaldehyde as an indicator to determine if the levels of formaldehyde observed in the 96 test trailers were of concern.
* This level of concern was intended solely for testing purposes and was applied only to this study of the 96 test trailers.
* Throughout the report, ATSDR clearly and repeatedly advised that 0.3 PPM should not be used as a minimum standard for all FEMA trailers.

ATSDR's study did not address long-term formaldehyde in trailers or health concerns related to potential exposures.
* ATSDR's consultation was designed to provide FEMA a clearer understanding of the issues associated with formaldehyde in temporary housing units.
* The consultation was not intended to establish FEMA's future policy concerning temporary housing units.
* The report's conclusions are not necessarily applicable to trailers other than the 96 test trailers examined in this study.

On Monday, July 23, CDC scientists will travel to the Gulf Coast to begin a new study of the FEMA trailers.
* The new CDC study will address the possible association between poor indoor air quality in the travel trailers and adverse health effects in children who live in them.
* CDC will test actual air quality conditions in travel trailers when they are used for prolonged periods of time under real-life conditions.
CDC will conduct thorough indoor environmental assessments collected over time along with interviews and observations of trailer residents, including children, and will focus on broader indoor air quality issues and exposures.

Holler, James S. (Jim) (ATSDR/DTEM/PRMSB)

From: Murray, Ed (ATSDR/DTEM)
Sent: Saturday, July 21, 2007 11:43 AM
To: Holler, James S. (Jim) (ATSDR/DTEM/PRMSB)
Subject: Fw: Scale of formaldehyde health effects

Please read.

Sent using BlackBerry

-----Original Message-----
From: Frumkin, Howard (ATSDR/OA/OD)
To: Wright, Scott V. (ATSDR/DTEM/PRMSB); Murray, Ed (ATSDR/DTEM); Fielding, Sascha (CDC/CCEHIP/NCEH); Olivares, Dagny (ATSDR/OC); Tylenda, Carolyn (ATSDR/DTEM/PRMSB); Little, Joseph D. (ATSDR/DTEM/PRMSB); McGeehin, Mike (CDC/CCEHIP/NCEH); Falk, Henry (CDC/CCEHIP/OD)
CC: Vatave, Ajay (CDC/CCHP/NCBDDD)
Sent: Sat Jul 21 11:08:32 2007
Subject: Scale of formaldehyde health effects

Colleagues:

I took a look at the information forwarded from Scott regarding the scale of formaldehyde effects. I'd recommend a true visual scale, analogous to the scales we've all seen that communicate the effects of rising levels of air pollutants or of rising blood lead levels. The scale ought to be visually "to scale," that is, the spacing ought to be proportional to the increases in air level. And the labeled points ought to be not only regulatory limits, but also biological limits, i.e. the level at which most people get symptoms, the odor threshold, etc.

To start this process I've rearranged the data from Scott's e-mail into a table (below, unfortunately probably not readable on blackberry). Can we work on this to complete it and transform it visually into a good communication tool?

Howie

Formaldehyde Exposure Level (ppm)

Description

What does this mean for your health?

0.001 – 0.068

Ambient air range

0.008

ATSDR chronic Minimal Risk Level (MRL)

0.016

NIOSH Recommended Exposure Limit (REL) (time weighted average)

0.03

ATSDR intermediate Minimal Risk Level (MRL)

0.04

ATSDR acute Minimal Risk Level (MRL)

0.1

NIOSH ceiling REL (15 minutes)

0.3

ACGIH Threshold Limit Value (not to be exceeded in workday)

0.75

OSHA permissible exposure limit (PEL) (time weighted average)

2.0

OSHA short-term exposure limit (STEL)

Howard Frumkin, M.D., Dr.P.H., Director
National Center for Environmental Health / Agency for Toxic Substances and Disease Registry Centers for Disease Control and Prevention 1600 Clifton Road, MS E-28 Atlanta, GA 30333 Tel 404-498-0004 Fax 404-498-0083 E-mail hfrumkin@cdc.gov FedEx deliveries:
1825 Century Boulevard
Atlanta, GA 30345

Nickle, Richard (ATSDR/DTEM/PRMSB)

From: Nickle, Richard (ATSDR/DTEM/PRMSB)
Sent: Tuesday, July 24, 2007 9:59 AM
To: Wright, Scott V. (ATSDR/DTEM/PRMSB)
Subject: RE: R6 HHS Request FW: formaldehyde trailer information

Mike already took care of that.

Rich Nickle
ATSDR Emergency Response

From: Wright, Scott V. (ATSDR/DTEM/PRMSB)
Sent: Tuesday, July 24, 2007 9:46 AM
To: Nickle, Richard (ATSDR/DTEM/PRMSB)
Subject: RE: R6 HHS Request FW: formaldehyde trailer information

Yes, this is what consumed all my time since last Wednesday. We helped draft Director Paulison with his Congressional testimony and helped with the new FEMA fact sheet.

Please inform the DEOC that Absolutely ALL inquiries and correspondence on "FEMA Toxic Trailers" needs to go directly to Dr. Mike McGheehin and Dr. Howie Frumkin with a cc: to Henry Falk.

Thanks,

Scott

From: Nickle, Richard (ATSDR/DTEM/PRMSB)
Sent: Tuesday, July 24, 2007 9:37 AM
To: Wright, Scott V. (ATSDR/DTEM/PRMSB)
Subject: FW: R6 HHS Request FW: formaldehyde trailer information

It seems this is more directed to the current CDC investigation than the consult, but FYI.

Rich Nickle
ATSDR Emergency Response

From: EOC Report (CDC)
Sent: Tuesday, July 24, 2007 9:25 AM
To: Shanley, Edwin (CDC/CCEHIP/NCEH); Allred, Phillip M. (Mike) (CDC/CCEHIP/NCEH); Nickle, Richard (ATSDR/DTEM/PRMSB)
Cc: EOC Report (CDC)
Subject: R6 HHS Request FW: formaldehyde trailer information

Holler, James S. (Jim) (ATSDR/DTEM/PRMSB)

From: Tylenda, Carolyn (ATSDR/DTEM/PRMSB)
Sent: Tuesday, July 24, 2007 5:36 PM
To: Holler, James S. (Jim) (ATSDR/DTEM/PRMSB)
Subject: FW: HCHO Matrix

As you can see, Scott sent forward material without even CCing you or me.

-----Original Message-----
From: Murray, Ed (ATSDR/DTEM)
Sent: Tuesday, July 24, 2007 4:56 PM
To: Tylenda, Carolyn (ATSDR/DTEM/PRMSB); Holler, James S. (Jim) (ATSDR/DTEM/PRMSB)
Subject: Fw: HCHO Matrix

Sent using BlackBerry

-----Original Message-----
From: Cibulas, William (ATSDR/DHAC/OD)
To: Frumkin, Howard (ATSDR/OA/OD); Wright, Scott V. (ATSDR/DTEM/PRMSB); Falk, Henry (CDC/CCEHIP/OD); McGeehin, Mike (CDC/CCEHIP/NCEH); Murray, Ed (ATSDR/DTEM); Orloff, Kenneth G. (ATSDR/DHAC/OD); Osterloh, John (CDC/CCEHIP/NCEH); Little, Joseph D. (ATSDR/DTEM/PRMSB); Garbe, Paul (CDC/CCEHIP/NCEH); Telfer, Jana L. (CDC/CCEHIP/NCEH)
Sent: Tue Jul 24 16:53:49 2007
Subject: RE: HCHO Matrix

Scott,

Thanks for the good work. Some additional thoughts….

1. We've provided two levels for background outdoor air, but are silent on background levels for indoor air.
2. I think the graphs should easily distinguish whether the levels are background, regulatory/advisory [with safety factors], or actual levels associated with health effects.
3. I'm concerned that we are silent on cancer. The tox profiles cite animal effect levels, and I realize that they are >2ppm.
4. What does this mean for your health? The 3 MRL discussions, in particular, need revised - somewhat unintelligible for our primary lay audience.

From: Frumkin, Howard (ATSDR/OA/OD)
Sent: Tuesday, July 24, 2007 4:14 PM
To: Wright, Scott V. (ATSDR/DTEM/PRMSB); Falk, Henry (CDC/CCEHIP/OD); McGeehin, Mike (CDC/CCEHIP/NCEH); Murray, Ed (ATSDR/DTEM); Cibulas, William (ATSDR/DHAC/OD); Orloff, Kenneth G. (ATSDR/DHAC/OD); Osterloh, John (CDC/CCEHIP/NCEH); Little, Joseph D. (ATSDR/DTEM/PRMSB); Garbe, Paul (CDC/CCEHIP/NCEH); Telfer, Jana L. (CDC/CCEHIP/NCEH)
Cc: Frumkin, Howard (ATSDR/OA/OD)
Subject: RE: HCHO Matrix

Very nice start. Suggested edits attached. (I changed NOAEL to LOAEL in the second entry, assuming that was an error. Right?)

The tables on products and occupations should be labeled "potential formaldehyde" exposure so as not to imply that exposure invariably occurs. Better yet, if the occupation data come from the old NIOSH NOES, we should eliminate the table; those data are very out of date. Instead we can simply name in text the few occupations (e.g. embalmer) that predictably feature substantial exposures.

The next step, after others have suggested additions, would be to see if Jana's shop can turn this into a nice, readable graphic, with the scale drawn to scale. This will be a

very useful communication tool.

Thanks Scott!

Howie << File: Formaldehyde Exposure Level - HF edits.doc >>

Howard Frumkin, M.D., Dr.P.H., Director
National Center for Environmental Health / Agency for Toxic Substances and Disease Registry Centers for Disease Control and Prevention 1600 Clifton Road, MS E-28 Atlanta, GA 30333 Tel 404-498-0004 Fax 404-498-0083 E-mail hfrumkin@cdc.gov FedEx deliveries:
1825 Century Boulevard
Atlanta, GA 30345

From: Wright, Scott V. (ATSDR/DTEM/PRMSB)
Sent: Tuesday, July 24, 2007 2:29 PM
To: Falk, Henry (CDC/CCEHIP/OD); Frumkin, Howard (ATSDR/OA/OD); McGeehin, Mike (CDC/CCEHIP/NCEH); Murray, Ed (ATSDR/DTEM); Cibulas, William (ATSDR/DHAC/OD); Orloff, Kenneth G. (ATSDR/DHAC/OD); Osterloh, John (CDC/CCEHIP/NCEH); Little, Joseph D. (ATSDR/DTEM/PRMSB); Garbe, Paul (CDC/CCEHIP/NCEH)
Subject: HCHO Matrix

<< File: Formaldehyde Exposure Level.doc >>

To All Parties,

After much consultation within DTEM & DHAC, here is what we feel is a creditable beginning. You will note that we did not illustrate levels above 2.0 PPM. Part of the reasoning about that is because that would exceed even the orginal ATSDR Level of Concern in the 2/1/2007 Health Consultation. The levels above 2.0 PPM would be so noxious anyways, most people probably would not stay in their trailers. If we want to add those numbers exceeding 2.0 PPM, it's easily done. You will also see that the NIOSH (2) and ACGIH values have no associated health effects listed next to them. This is in part, due to the last time NIOSH revised their numbers, I could not find the corresponding, supporting Criteria Document which prompted the new number. What is on the NIOSH web-site is the original Criteria Document dated 1977 which supported the then REL of 1.0 PPM. Ditto, for the ACGIH number.

I also added 2 tables about sources of HCHO and occupations which might expose people to HCHO to illustrate the scope of the potential ramifications of this formaldehyde issue.

You will also note that this has been sent to Science folks only, at this point.

Please take a gander and make comments

Thanks,

Scott

Frumkin, Howard (ATSDR/OA/OD)

From: Olivares, Dagny (ATSDR/OC)
Sent: Wednesday, July 25, 2007 5:45 PM
To: Frumkin, Howard (ATSDR/OA/OD)
Subject: HAN Feedback from the Emergency Communications System (ECS)

Importance: High

Attachments: Final Formaldehyde HAN ed ECS.doc

Dr. Frumkin,

ECS has asked us to make a few changes to the HAN. The first is to do away with the sectioned structure (which they feel looks and read like a fact sheet), so you will find that the first sentence of these paragraphs (numbers 3-6) have changed. Additionally they have asked us to target clinicians more directly, telling them what they should expect and how they should proceeded, you will find these changes were incorporated into the second paragraph, the final two paragraphs, and the new introductory sentences for paragraphs 3-6.

They felt these changes would more clearly define why they should be concerned and what actions they should take.

Thank you for your review.

Final Formaldehyde HAN ed ECS....

This is an official
CDC Health Advisory

Distributed via Health Alert Network
July 25, 2007, XXX EDT
CDCHAN-00XXX-yy-mm-dd-UPD-N

Information about Potential Health Problems of People Living in Mobile Homes

In the aftermath of Hurricane Katrina, the Federal Emergency Management Agency (FEMA) provided either mobile homes or travel trailers to Gulf Coast victims who had lost their homes in the hurricane. Currently, nearly 65,000 households occupy units in Alabama, Louisiana, Mississippi, and Texas. Most (97%) of the units are located in Louisiana and Mississippi. Concerns have surfaced recently about air quality in the trailers and the occurrence of respiratory and other symptoms resulting from exposure to formaldehyde or other respiratory irritants among residents of the mobile homes.

Persons who live in mobile homes and travel trailers and are concerned about formaldehyde exposure have been directed to seek medical treatment. If these persons present with respiratory symptoms, formaldehyde exposure should be considered as a contributing factor. CDC provides in this document current knowledge about formaldehyde for clinicians that may assist them in addressing patients' symptoms and concerns.

Formaldehyde is a volatile organic compound that is released as a gas from adhesives (urea-formaldehyde resins) that are used to make products such as particle board, plywood, and hardwood paneling. These materials are used extensively in mobile homes and travel trailers, but formaldehyde can be found in almost all buildings and homes. Formaldehyde is also released from urea-formaldehyde foams in wall insulation. Older homes and mobile homes may contain this form of insulation although it is used less frequently today. Formaldehyde is also used in fertilizers and some household items such as carpets, permanent-press fabrics, and household cleaners.

Patients who have been chronically exposed to formaldehyde may present with respiratory signs and symptoms. Formaldehyde can irritate the skin, eyes, nose, throat, sinuses, and lungs, resulting in itching, watery eyes, and cough. Some people may develop skin rashes. Others may experience difficulty in breathing with wheezing and bronchoconstriction. At-risk populations with underlying asthma, pulmonary disease, or other comorbidities may be more severely affected. Note that these signs and symptoms may also be caused by other air-borne irritants or allergens including mold, tobacco smoke, pets, mites, cockroaches, and urban smog. People can smell formaldehyde when it is at very low levels, but they can also manifest symptoms even when they cannot smell the chemical.

Clinicians considering a diagnosis of formaldehyde reaction should base that decision on clinical grounds: a history of exposure, symptoms consistent with formaldehyde, a temporal association of exposure with symptoms, and the exclusion of alternative explanations for the symptoms. Physicians should recall that some patients may react to formaldehyde at quite low levels of exposure. Among sensitive individuals, formaldehyde antibodies (IgG and/or IgE) may form, but no antibody test has been validated for routine diagnostic use. Diagnostic challenge in an exposure chamber is a theoretical approach to confirming the diagnosis, but is not recommended for routine clinical use.

Clinicians should treat exposure to formaldehyde symptomatically; there is no specific antidote or treatment for environmental exposure. Asthma associated with formaldehyde exposure should

be treated with the usual approach to asthma with consideration given to avoiding specific exposures and allergens and using beta agonist bronchodilators and steroids, depending on the judgment of the physician and the patient's comorbidities. Symptoms should lessen if the affected individual is removed from the area of exposure. Physicians and health care providers should encourage their patients to open windows and use fans to bring fresh air indoors as ways to reduce exposure to formaldehyde.

Clinicians can access additional information about indoor air pollution and formaldehyde at http://www.epa.gov/iaq/formalde.html.

For emergent information about acute exposures, physicians should contact their local poison control center. Call 1-800-222-1222 to locate the nearest poison control center. More information about the American Association of Poison Control Centers is available at www.aapcc.org.

Frumkin, Howard (ATSDR/OA/OD)

From:	De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent:	Wednesday, July 25, 2007 11:16 AM
To:	McGeehin, Mike (CDC/CCEHIP/NCEH); Falk, Henry (CDC/CCEHIP/OD); Frumkin, Howard (ATSDR/OA/OD); Sinks, Tom (ATSDR/OA/OD)
Cc:	Rifenburg, James A. (CDC/CCEHIP/NCEH)
Subject:	Re: FEMA Announces Trailer Air Testing Plans

Thanks Mike. Your response is appreciated.

However, the sampling data I referred to was provided by FEMA late last year or early this year.

I am simply asking what is being done to properly inform the inhabitatants about the health effects of formaldehyde. I am also asking that the actions being taken be shared w/ those involved.

For example, I have seen no mention of reproductive developmental hazards in the materials distributed to the residents.

If we are aware of gaps in communication of health information this should be brought to someone's attention so that it can be acted upon.

With respect to sampling, would EPA also be included?

If you wish to discuss any of this please give me a call.

Thanks
Chris

Sent from my BlackBerry Wireless Device

-----Original Message-----
From: McGeehin, Mike (CDC/CCEHIP/NCEH)
To: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD); Falk, Henry (CDC/CCEHIP/OD); Frumkin, Howard (ATSDR/OA/OD); Sinks, Tom (ATSDR/OA/OD)
CC: Rifenburg, James A. (CDC/CCEHIP/NCEH)
Sent: Wed Jul 25 07:38:41 2007
Subject: Re: FEMA Announces Trailer Air Testing Plans

Chris,

Thanks for your comments. There is no one involved in this undertaking who does not understand the public health importance of what we are doing. We are going to provide scientifically valid data on the real-life air quality of these trailers and its possible association with health effects. We will supply that info as rapidly as possible to the risk managers, FEMA, for them to make an informed decision. As of now, the type of data on which to base a decision whether to uproot 66,000 families is lacking.

Everyone involved in this from CDC has moved rapidly and enthusistically. The only delays we have faced was in waiting for FEMA's request and their answers to 2 pages of questions that we sent.

We want to supply data to FEMA that we can stand behind. If, during the course of our investigation, we discern trends of concern or alarming levels, we will notify FEMA immediately.

A decision to relocate 66,000 families should not be based on limited sampling of unoccupied units or on data from an envionmental group. However, those data are driving us to move rapidly in writing the sampling strategies and protocols.

I'm on bberry, so there may be spelling or punctuation errors.

If ypu have further ideas or comments, a meeting or phone call would probably be more helpful than having to write all of this in an email. Emails can be interpreted so many ways by different readers inside and outsiide the agency.

Thanks,
Mike

Sent from my BlackBerry Wireless Device

-----Original Message-----
From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
To: McGeehin, Mike (CDC/CCEHIP/NCEH); Armstrong, Katherine (Kitty) (CDC/CCEHIP/NCEH); Falk, Henry (CDC/CCEHIP/OD); Frumkin, Howard (ATSDR/OA/OD); Sinks, Tom (ATSDR/OA/OD)
CC: Rifenburg, James A. (CDC/CCEHIP/NCEH); Noonan, Gary (CDC/CCEHIP/NCEH); Garbe, Paul (CDC/CCEHIP/NCEH); Stock, Allison Lynn (CDC/CCEHIP/NCEH); Reed, Larry (CDC/NIOSH/DSHEFS); Sussell, Aaron L. (CDC/NIOSH/DSHEFS); Cibulas, William (ATSDR/DHAC/OD); Orloff, Kenneth G. (ATSDR/DHAC/OD); Mortensen, Mary E. (CDC/CCEHIP/NCEH); Thomas, Jerry (CDC/CCEHIP/NCEH); Gressel, Michael G. (CDC/NIOSH/DART); Rodenbeck, Sven (ATSDR/DHAC/CAPEB)
Sent: Tue Jul 24 22:20:53 2007
Subject: Re: FEMA Announces Trailer Air Testing Plans

Colleagues,

While testing may be warranted, what immediate interventions are being purfsued thru appropriate channels to interdict exposures?
Or to mitigate health impacts?

I am concerned that the reported clinical signs, are the harbinger of a impending public health disaster.

We know based on data provided to us that levels are up to 80 times higher than peak occupational limits and up to 300 times higher than our health guidance values.

I think we must be more proactive in protecting the people while assisting FEMA.

Chris

Sent from my BlackBerry Wireless Device

-----Original Message-----
From: McGeehin, Mike (CDC/CCEHIP/NCEH)
To: Armstrong, Katherine (Kitty) (CDC/CCEHIP/NCEH); Falk, Henry (CDC/CCEHIP/OD); Frumkin, Howard (ATSDR/OA/OD); Sinks, Tom (ATSDR/OA/OD)
CC: Rifenburg, James A. (CDC/CCEHIP/NCEH); Noonan, Gary (CDC/CCEHIP/NCEH); Garbe, Paul (CDC/CCEHIP/NCEH); Stock, Allison Lynn (CDC/CCEHIP/NCEH); De Rosa, Christopher (Chris) (ATSDR/DTEM/OD); Reed, Larry (CDC/NIOSH/DSHEFS); Sussell, Aaron L. (CDC/NIOSH/DSHEFS); Cibulas, William (ATSDR/DHAC/OD); Orloff, Kenneth G. (ATSDR/DHAC/OD); Mortensen, Mary E. (CDC/CCEHIP/NCEH); Thomas, Jerry (CDC/CCEHIP/NCEH); Gressel, Michael G. (CDC/NIOSH/DART); Rodenbeck, Sven (ATSDR/DHAC/CAPEB)
Sent: Mon Jul 23 14:20:26 2007
Subject: RE: FEMA Announces Trailer Air Testing Plans

Unfortunately, what the Administrator is saying is inaccurate. We will not be dong testing on Tuesday.

Michael A. McGeehin, PhD, MSPH
Director,
Division of Environmental Hazards and Health Effects
National Center for Environmental Health, MS-F-52
Centers for Disease Control and Prevention
Atlanta, GA 30333
(770) 488-3400; fax - (770) 488-3460

From: Armstrong, Katherine (Kitty) (CDC/CCEHIP/NCEH)
Sent: Monday, July 23, 2007 1:49 PM
To: Falk, Henry (CDC/CCEHIP/OD); Frumkin, Howard (ATSDR/OA/OD); Sinks, Tom (ATSDR/OA/OD); McGeehin, Mike (CDC/CCEHIP/NCEH)
Cc: Rifenburg, James A. (CDC/CCEHIP/NCEH); Noonan, Gary (CDC/CCEHIP/NCEH); Garbe, Paul (CDC/CCEHIP/NCEH); Stock, Allison Lynn (CDC/CCEHIP/NCEH); De Rosa, Christopher (Chris) (ATSDR/DTEM/OD); Reed, Larry (CDC/NIOSH/DSHEFS); Sussell, Aaron L. (CDC/NIOSH/DSHEFS); Cibulas, William (ATSDR/DHAC/OD); Orloff, Kenneth G. (ATSDR/DHAC/OD); Mortensen, Mary E. (CDC/CCEHIP/NCEH); Thomas, Jerry (CDC/CCEHIP/NCEH); Gressel, Michael G. (CDC/NIOSH/DART); Rodenbeck, Sven (ATSDR/DHAC/CAPEB)
Subject: FEMA Announces Trailer Air Testing Plans

Associated Press Friday, July 20, 2007
FEMA Announces Trailer Air Testing Plans
By DOUG SIMPSON
Associated Press Writer
BAKER, La. (AP) -- Federal agencies will test air quality in trailers housing hurricane victims, an official said Friday, a day after documents revealed that government lawyers discouraged investigating reports of high formaldehyde levels in them. First on Saturday, the Federal Emergency Management Agency will begin distributing a fact sheet on formaldehyde and housing to the occupants of each travel trailer and mobile home the agency issued in Alabama, Louisiana, Mississippi and Texas, said R. David Paulison, FEMA's administrator.

"This fact sheet will provide basic information about formaldehyde, its possible medical effects and contacts for further assistance," he said. Then on Tuesday, the U.S. Centers for Disease Control and

Prevention and the Department of Homeland Security's Office of Health Affairs will conduct a preliminary field study that will test the air in "FEMA-purchased housing units under real-life conditions," Paulison said.

"We are also looking into engineering solutions that may be available effectively to remove environmental pollutants from the trailers," he said. FEMA provided more than 120,000 trailers to people displaced by hurricanes Katrina and Rita in 2005. Thousands of people still live in them, mostly in Louisiana, Mississippi and Arkansas.

On Thursday, documents released to the House Oversight and Government Reform Committee showed FEMA lawyers discouraged the agency from pursuing reports that the trailers had dangerous levels of formaldehyde, which can cause respiratory problems.
Residents of Renaissance Village, a FEMA trailer park in Baker, said they have no proof the trailers are causing illness. Wilbert Ross, 60, had asthma and emphysema before Katrina, conditions that have worsened since he moved into the trailer - a common complaint among the community's residents.

"Here, you have a whole community that has health problems," Ross said. During Thursday's hearing in the House, Paulison apologized to trailer occupants. Earlier this week, the agency had issued a statement saying air quality in the trailers is safe if they are properly ventilated. The formaldehyde complaints had sparked lawsuits before the congressional hearing, and more are likely.

Justin Woods, a New Orleans lawyer who filed a lawsuit that accuses FEMA of exposing trailer occupants to the chemical, said he expects an "onslaught" of similar litigation. Woods represents the family of Desiree Collins, 47, a Renaissance Village resident who died July 2, about a week after she was found to have lung cancer. On behalf of Collins' husband and children, Woods asked a federal judge to certify a class-action lawsuit - not against FEMA, but against companies that sold trailers to the agency. Collins said his suit is one of several in Louisiana - none of which has yet been certified class-action.
"It's still at a very early stage in the litigation," he said.

In May, the Mississippi chapter of the Sierra Club issued a nonscientific report saying its tests revealed high formaldehyde emissions in dozens of trailers in Mississippi and Louisiana. Chapter co-chair Becky Gillette said she is concerned that FEMA's response to the problem appears limited to conducting more tests.

"The remedy is still just far down the line for the tens of thousands of folks still living in the trailers," Gillette said. Formaldehyde is used in some materials in the trailers. It can irritate the eyes, nose, throat and skin, according to the U.S. Department of Health and Human Services.

FEMA said it will open on Saturday a toll-free hot line to answer questions about the formaldehyde issue and associated FEMA housing concerns, he said. The toll-free number is 866-562-2381.

Associated Press writers Mike Kunzelman in New Orleans and Shelia Byrd in Jackson, Miss., contributed to this report.

Kitty Armstrong
Associate Director for Policy (Acting)
Division of Environmental Hazards and
Health Effects (MS F52)
National Center for Environmental Health, CDC

De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)

From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Thursday, July 26, 2007 8:06 PM
To: Weston, Richard C. (CDC/OD/CDCW)
Subject: FW: CDC Advisory 00265 - Potential Health Problems Related to Formaldehyde Among People Living in Mobile Homes or Travel Trailers

They still don't mention the long term health effects and developmental toxicity.
Christopher T. De Rosa, M.S., Ph.D.
Director, Division of Toxicology and Environmental Medicine
Agency for Toxic Substances and Disease Registry
1600 Clifton Road - Mailstop F32
Atlanta, GA 30333
(770) 488-7003

From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Thursday, July 26, 2007 7:46 PM
To: Weston, Richard C. (CDC/OD/CDCW)
Subject: RE: CDC Advisory 00265 - Potential Health Problems Related to Formaldehyde Among People Living in Mobile Homes or Travel Trailers

Thanks Richard. I have been directed that any commutations by me outside the coordinating center must first be cleared by Howie and that I must inform him of any contacts initiated from outside the coordinating Center w/i 24 hours

Christopher T. De Rosa, M.S., Ph.D.
Director, Division of Toxicology and Environmental Medicine
Agency for Toxic Substances and Disease Registry
1600 Clifton Road - Mailstop F32
Atlanta, GA 30333
(770) 488-7003

From: Weston, Richard C. (CDC/OD/CDCW)
Sent: Thursday, July 26, 2007 3:57 PM
To: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Subject: FW: CDC Advisory 00265 - Potential Health Problems Related to Formaldehyde Among People Living in Mobile Homes or Travel Trailers

This comes as a total surprise to me. I would like to think that your efforts had something to do with it.
--Richard

From: Health Alert Network (CDC)
Sent: Thursday, July 26, 2007 1:11 PM
To: Health Alert Network (CDC)
Subject: CDC Advisory 00265 - Potential Health Problems Related to Formaldehyde Among People Living in Mobile Homes or Travel Trailers

This is an official

CDC Health Advisory

Distributed via Health Alert Network
July 26, 2007, 13:10 EDT (01:10 PM EDT)
CDCHAN-00265-07-07-26-ADV-N

Potential Health Problems Related to Formaldehyde Among People Living in Mobile Homes or Travel Trailers

In the aftermath of Hurricane Katrina, the Federal Emergency Management Agency (FEMA) provided either mobile homes

A-69

or travel trailers to Gulf Coast victims who had lost their homes in the hurricane. Currently, nearly 65,000 households occupy units in Alabama, Louisiana, Mississippi, and Texas. Most (97%) of the units are located in Louisiana and Mississippi. Concerns have surfaced recently about air quality in the trailers and the occurrence of respiratory and other symptoms resulting from exposure to formaldehyde or other respiratory irritants among residents of the mobile homes. CDC is working with FEMA to investigate the health concerns of those living in the trailers and mobile homes.

Persons who live in mobile homes and travel trailers and are concerned about formaldehyde exposure have been directed to seek medical treatment. If these persons present with respiratory symptoms, formaldehyde exposure should be considered as a contributing factor. CDC provides in this document current knowledge about formaldehyde for clinicians that may assist them in addressing patients' symptoms and concerns.

Formaldehyde is a volatile organic compound that is released as a gas from adhesives (urea-formaldehyde resins) that are used to make products such as particle board, plywood, and hardwood paneling. These materials are used extensively in mobile homes and travel trailers, but formaldehyde can be found in almost all buildings and homes. Formaldehyde is also released from urea-formaldehyde foams in wall insulation. Older homes and mobile homes may contain this form of insulation although it is used less frequently today. Formaldehyde is also used in fertilizers and some household items such as carpets, permanent-press fabrics, and household cleaners.

Patients who have been exposed to formaldehyde may present a variety of symptoms. Formaldehyde can irritate the skin, eyes, nose, throat, sinuses, and lungs, resulting in itching, watery eyes, and cough. Some people may develop skin rashes. Others may experience difficulty in breathing with wheezing and bronchoconstriction. At-risk populations with underlying asthma, pulmonary disease, or other comorbidities may be more severely affected. These signs and symptoms may also be caused by other air-borne irritants or allergens including mold, tobacco smoke, pets, mites, cockroaches, and urban smog. People can smell formaldehyde when it is at very low levels, but they can also manifest symptoms even when they cannot smell the chemical.

Diagnosis of formaldehyde reaction is based on clinical grounds including a history of exposure, symptoms consistent with formaldehyde, a temporal association of exposure with symptoms, and the exclusion of alternative explanations for the symptoms. Some people react to formaldehyde at very low levels of exposure. Among sensitive individuals, formaldehyde antibodies (IgG and/or IgE) may form, but no antibody test has been validated for routine diagnostic use. Diagnostic challenge in an exposure chamber is a theoretical approach to confirming the diagnosis, but is not recommended for routine clinical use.

There is no specific antidote or treatment for environmental exposure. Exposure to formaldehyde should be treated symptomatically. Asthma associated with formaldehyde exposure should be treated with the usual approach to asthma with consideration given to avoiding specific exposures and allergens and using beta agonist bronchodilators and steroids, depending on the judgment of the health care provider and the patient's comorbidities. Symptoms should lessen if the affected individual is removed from the area of exposure. Patients should be encouraged to open windows and use fans to bring fresh air indoors as ways to reduce exposure to formaldehyde.

Clinicians can access additional information about indoor air pollution and formaldehyde at http://www.epa.gov/iaq/formalde.html.

For emergent information about acute exposures health care providers should contact their local poison control center. Call 1-800-222-1222 to locate the nearest poison control center. More information about the American Association of Poison Control Centers is available at www.aapcc.org.

Categories of Health Alert messages:

Health Alert	conveys the highest level of importance; warrants immediate action or attention.
Health Advisory	provides important information for a specific incident or situation; may not require immediate action.
Health Update	provides updated information regarding an incident or situation; unlikely to require immediate action.

##This Message was distributed to State and Local Health Officers, Epidemiologists, State Laboratory Directors, PHEP Coordinators, HAN Coordinators and Public Information Officers as well as Public Health Associations and Clinician organizations##

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A-4-10

Fielding, Sascha (CDC/CCEHIP/NCEH)

From: Fielding, Sascha (CDC/CCEHIP/NCEH)
Sent: Saturday, July 28, 2007 1:30 AM
To: Olivares, Dagny (ATSDR/OC)
Subject: Re: FEMA Trailers - Language to post with link to report prepared by ATSDR for web site

I just checked the link and it looks perfect!

Sent from my BlackBerry Wireless Device

-----Original Message-----
From: Olivares, Dagny (ATSDR/OC)
To: McGeehin, Mike (CDC/CCEHIP/NCEH); Fielding, Sascha (CDC/CCEHIP/NCEH); Frumkin, Howard (ATSDR/OA/OD); Telfer, Jana L. (CDC/CCEHIP/NCEH)
CC: Groutt, Mike (ATSDR/OPPE)
Sent: Sat Jul 28 01:17:57 2007
Subject: Re: FEMA Trailers - Language to post with link to report prepared by ATSDR for web site

The report and intro page are live

-----Original Message-----
From: McGeehin, Mike (CDC/CCEHIP/NCEH)
To: Fielding, Sascha (CDC/CCEHIP/NCEH); Frumkin, Howard (ATSDR/OA/OD)
CC: Olivares, Dagny (ATSDR/OC); Groutt, Mike (ATSDR/OPPE)
Sent: Fri Jul 27 17:00:39 2007
Subject: Re: FEMA Trailers - Language to post with link to report prepared by ATSDR for web site

I would change the question to " do empty trailers have formaldehyde levels that can adversely effect human health?"

Otherwise very good

Sent from my BlackBerry Wireless Device

-----Original Message-----
From: Fielding, Sascha (CDC/CCEHIP/NCEH)
To: Frumkin, Howard (ATSDR/OA/OD); McGeehin, Mike (CDC/CCEHIP/NCEH)
CC: Olivares, Dagny (ATSDR/OC); Groutt, Mike (ATSDR/OPPE)
Sent: Fri Jul 27 16:28:56 2007
Subject: FEMA Trailers - Language to post with link to report prepared by ATSDR for web site

Hi there!

We have drafted the following language to introduce the report prepared by ATSDR. This is intended to clarify any interpretations that have been made about this analysis upfront. If you could quickly review and comment, we can get this posted to the website right away.

Thanks!
Sascha

During the summer of 2006, the Federal Emergency Management Agency (FEMA) asked the Agency for Toxic Substances and Disease Registry (ATSDR) to analyze formaldehyde sampling data collected in 96 unoccupied trailers by the Environmental Protection Agency. These unoccupied trailers were similar to those distributed by FEMA to house persons displaced by Hurricane Katrina.

Fielding, Sascha (CDC/CCEHIP/NCEH)

From: Fielding, Sascha (CDC/CCEHIP/NCEH)
Sent: Monday, July 30, 2007 8:27 AM
To: McGeehin, Mike (CDC/CCEHIP/NCEH); Olivares, Dagny (ATSDR/OC)
Subject: RE: FEMA Trailers - Language to post with link to report prepared by ATSDR for web site

Good Morning Mike,

The FEMA spotlight is actually of the EH landing page from the CDC home page.

http://www.cdc.gov/Features/FEMAtrailers/

Formaldehyde is spotlighted on the NCEH and ATSDR webpage.

Thanks!
Sascha

-----Original Message-----
From: McGeehin, Mike (CDC/CCEHIP/NCEH)
Sent: Monday, July 30, 2007 6:48 AM
To: Olivares, Dagny (ATSDR/OC); Fielding, Sascha (CDC/CCEHIP/NCEH)
Subject: RE: FEMA Trailers - Language to post with link to report prepared by ATSDR for web site

Dagny,

Is it true that our spotlight on the FEMA issue is on the ATSDR website?

Mike

Michael A. McGeehin, PhD, MSPH
Director,
Division of Environmental Hazards and Health Effects National Center for Environmental Health, MS-F-52 Centers for Disease Control and Prevention Atlanta, GA 30333
(770) 488-3400; fax - (770) 488-3460

-----Original Message-----
From: Olivares, Dagny (ATSDR/OC)
Sent: Friday, July 27, 2007 5:52 PM
To: McGeehin, Mike (CDC/CCEHIP/NCEH); Fielding, Sascha (CDC/CCEHIP/NCEH); Frumkin, Howard (ATSDR/OA/OD); Telfer, Jana L. (CDC/CCEHIP/NCEH)
Cc: Groutt, Mike (ATSDR/OPPE)
Subject: RE: FEMA Trailers - Language to post with link to report prepared by ATSDR for web site
Importance: High

Thank you Mike.

Dr. Frumkin, have you had a chance to look at it yet? We have a web developer standing by to post this but he does need to leave at 6:15.

Thank you.

-----Original Message-----
From: McGeehin, Mike (CDC/CCEHIP/NCEH)
Sent: Friday, July 27, 2007 5:01 PM
To: Fielding, Sascha (CDC/CCEHIP/NCEH); Frumkin, Howard (ATSDR/OA/OD)
Cc: Olivares, Dagny (ATSDR/OC); Groutt, Mike (ATSDR/OPPE)
Subject: Re: FEMA Trailers - Language to post with link to report prepared by ATSDR for web site

I would change the question to " do empty trailers have formaldehyde levels that can adversely effect human health?"

Otherwise very good

Sent from my BlackBerry Wireless Device

-----Original Message-----
From: Fielding, Sascha (CDC/CCEHIP/NCEH)
To: Frumkin, Howard (ATSDR/OA/OD); McGeehin, Mike (CDC/CCEHIP/NCEH)
CC: Olivares, Dagny (ATSDR/OC); Groutt, Mike (ATSDR/OPPE)
Sent: Fri Jul 27 16:28:56 2007
Subject: FEMA Trailers - Language to post with link to report prepared by ATSDR for web site

Hi there!

We have drafted the following language to introduce the report prepared by ATSDR. This is intended to clarify any interpretations that have been made about this analysis upfront. If you could quickly review and comment, we can get this posted to the website right away.

Thanks!
Sascha

During the summer of 2006, the Federal Emergency Management Agency (FEMA) asked the Agency for Toxic Substances and Disease Registry (ATSDR) to analyze formaldehyde sampling data collected in 96 unoccupied trailers by the Environmental Protection Agency. These unoccupied trailers were similar to those distributed by FEMA to house persons displaced by Hurricane Katrina.

ATSDR's consultation was intended to answer the question "Do empty trailers get to the point we know health effects to occur?" The short answer is yes.

ATSDR chose to compare the data from the sampling of unoccupied trailers to 0.3 parts of formaldehyde per million parts of air (ppm), based on scientific literature that has documented health effects from exposure to formaldehyde at that level. The 0.3 ppm is the level at which health effects are clearly observed. This level is higher than the level that would be considered acceptable for families to live in. In its Toxicological Profile about formaldehyde, ATSDR, provides minimal risk levels (MRLs) for exposures to formaldehyde. At or below the MRL a person exposed daily to a hazardous substance would not usually experience health effects. These levels are 0.04 ppm of formaldehyde for 1 to 14 days of continuous exposure, 0.03 ppm of formaldehyde for up to 365 days of continuous exposure, and 0.008 ppm of formaldehyde for longer than 1 year. More information on formaldehyde may be found at http://www.atsdr.cdc.gov/toxprofiles/tp111.html.

ATSDR recommends that a more conservative measure than 0.3 ppm should be used when making public health decisions, especially when considering the health of potentially sensitive individuals. For example, the long-term exposure MRL for formaldehyde of 0.008 is 37 ½ times more conservative than the level at which health effects have been observed in sensitive populations, such as young children.

ATSDR and its sister agency, the Centers for Disease Control and Prevention, are now working with FEMA to undertake a rigorous investigation of the health concerns of those living in the trailers. There are other potential concerns in addition to formaldehyde, such as mold and other chemicals. The CDC study will take a broad look at these exposures. The investigation will address the possible association between conditions in the travel trailers and health problems in children who live in them. CDC will test actual air quality conditions in travel trailers when they are used for prolonged periods of time under real-life conditions. CDC, ATSDR and FEMA will work together to identify practical means of reducing indoor air levels of formaldehyde to acceptable levels.

Fielding, Sascha (CDC/CCEHIP/NCEH)
From: Fielding, Sascha (CDC/CCEHIP/NCEH)
Sent: Monday, July 30, 2007 10:38 AM
To: Williams, Louise W. (ATSDR/OA/OD)
Subject: RE: Broad Issue of Health and Safety of Modular Homes

THANKS!!

From: Williams, Louise W. (ATSDR/OA/OD)
Sent: Monday, July 30, 2007 10:31 AM
To: Fielding, Sascha (CDC/CCEHIP/NCEH)
Subject: RE: Broad Issue of Health and Safety of Modular Homes

Hi Sascha,
Yes it is available and I've booked it for you.

Louise ☺

-----Original Appointment-----
From: Fielding, Sascha (CDC/CCEHIP/NCEH)
Sent: Monday, July 30, 2007 9:51 AM
To: Williams, Louise W. (ATSDR/OA/OD)
Subject: FW: Broad Issue of Health and Safety of Modular Homes
When: Thursday, August 02, 2007 12:30 PM-1:30 PM (GMT-05:00) Eastern Time (US & Canada).
Where: OD Conference Room

Can you please check on the OD conference room availability for this meeting?

From: Fielding, Sascha (CDC/CCEHIP/NCEH)
Sent: Monday, July 02, 2007 10:36 AM
To: Fielding, Sascha (CDC/CCEHIP/NCEH); McGeehin, Mike (CDC/CCEHIP/NCEH); Brown, Mary Jean (CDC/CCEHIP/NCEH); Meyer, Pamela (CDC/CCEHIP/OD); Frumkin, Howard (ATSDR/OA/OD); Deitchman, Scott (CDC/CCEHIP/NCEH); Noonan, Gary (CDC/CCEHIP/NCEH); Weston, Richard C. (CDC/OD/CDCW); Sinks, Tom (ATSDR/OA/OD); Bashor, Mark M. (CDC/CCEHIP/NCEH); Vatave, Ajay (CDC/CCHP/NCBDDD); Rogers, Barbara A. (CDC/OD/CDCW); Weston, Richard C. (CDC/OD/CDCW); Murray, Ed (ATSDR/DTEM)
Subject: Broad Issue of Health and Safety of Modular Homes
When: Thursday, August 02, 2007 12:30 PM-1:30 PM (GMT-05:00) Eastern Time (US & Canada).
Where: OD Conference Room

Hi there - this meeting is being rescheduled to accommodate schedules. Several key staff are out this week conducting meetings related to the FEMA trailers.

Thanks!

Hello!

Dr. Frumkin has asked that we convene a meeting in the broad area of health and safety of modular homes. This stems from the requests and subsequent actions we are taking in with the FEMA trailer temporary emergency housing issue. It appears from our involvement and framing of this issue that there are some gaps in understanding the health issues related to living (or working, or attending school) in modular units (aka mobile homes).

Dr. Frumkin would like for us to meet and strategize on how best to move forward as an agency in this issue. He suggested we could identify and review the health issues related to living in modular units, including indoor air quality, crowding, noise, etc. This could lead to a set of guidelines for safe, healthy use of modular units that we could then refer to in case of FEMA trailer situations, if a school contacts us about temporary classrooms, and so on.

Thanks!
Sascha

Sinks, Tom (ATSDR/OA/OD)

From: Sowell, Anne (ATSDR/DHS/OD)
Sent: Wednesday, August 08, 2007 6:10 PM
To: Bashor, Mark M. (CDC/CCEHIP/NCEH)
Cc: Williamson, G. David (ATSDR/DHS/OD); Dearwent, Steve (ATSDR/DHS/HIBR); Sinks, Tom (ATSDR/OA/OD)
Subject: FW: FEMA trailer consult
Attachments: fema.xls; formaldehyde_report_0507.pdf

Mark,

Lynn Wilder is an industrial hygienist. She read the news clips about the FEMA trailer work and became interested in what ATSDR did. After reading the initial report from ATSDR on FEMA trailers that was done by DTEM she is very concerned about the work that was done and the conclusions of the consult. Her concerns are stated below.

The sampling scheme was designed by FEMA and the data collected by EPA. ATSDR was apparently asked to only comment on the formaldehyde levels observed and specifically asked to not comment on the health effects since this is mentioned several times in the report. However the spin in this report is that the levels observed are safe for all but sensitized individuals and this appears to not be supported by the accepted standards for occupational exposure noted below. If ATSDR was asked not to comment on the health effects, it would still have been possible for the report to include information about the acceptable occupational exposure levels to put the findings into a more appropriate context.

Could we talk about this?

Thanks,

Anne

From: Wilder, Lynn (ATSDR/DHS/HIBR)
Sent: Wednesday, August 08, 2007 5:19 PM
To: Sowell, Anne (ATSDR/DHS/OD)
Cc: Wilder, Lynn (ATSDR/DHS/HIBR)
Subject: FEMA trailer consult

Anne,
I read the daily news clips and the ATSDR formaldehyde evaluation (attached pdf) caught my attention for many reasons. I've tried to outline them:

1) Except for the first day, the conditions during air sampling are not reflective—they underestimate--of typical residential exposure. Indoor sampling to evaluate a health hazard is done with the home sealed as much as possible and a furnace turned on to represent worse case conditions.

- The results show that during the 1st day (24-hr sample w/doors and windows closed had higher maximum (up to 2,035 and 2,280 ppb)and average (1,030 and 1,028 ppb) values than almost all of the rest of the sampling days (when the homes were ventilated).
- Even the rest of the samples, which were collected with doors and windows open or with the air conditioning set to 72 and bathroom vents open detected levels of concern. The average of all of the daily average values was 393 ppb; the average of all daily maximum values was 1,007 ppb.

2) Even with the doors and windows open, formaldehyde levels exceed:

- all three ATSDR MRLs: acute (1-14 days)= 40 ppb; intermediate (14-365 days)=30 ppb; and chronic (>365 days)=8 ppb;

- the ACGIH occupational short-term (15 min) exposure guideline of 300 ppb;
- the NIOSH 15-minute ceiling value of 100 ppb;
- the OSHA 8-hour average of 750 ppb and their short-term exposure level of 2000 ppb; and
- the AIHA ERPG of 1200 ppb

3) I am extremely concerned that we have compared the air sampling results with an occupational exposure level of 300 ppb (ACGIH)—residents are exposed for up to 24 hours/day and may reside in these homes for years. This exposure should not be compared to a 15-minute occupational value.

I have also attached a quick and dirty excel spreadsheet that converts the ug/m3 data in the health consult into ppb for your info.
I would be happy to assist in any possible follow-up that may be required.

Thanks
Lynn

Lynn Wilder, MSHyg, CIH
ATSDR
Division of Health Studies, Health Investigation Branch
1600 Clifton Rd, NE (E-31)
Atlanta, GA 30333
404-498-0585
498-0077 (fax)
lwilder@cdc.gov
New overnight address:
ATSDR, DHS, HIB (floor 3), 2400 Century Center Blvd
Atlanta, GA 30345

Frumkin, Howard (ATSDR/OA/OD)

From: Frumkin, Howard (ATSDR/OA/OD)
Sent: Thursday, August 09, 2007 10:22 PM
To: Falk, Henry (CDC/CCEHIP/OD); Sinks, Tom (ATSDR/OA/OD); McGeehin, Mike (CDC/CCEHIP/NCEH)
Subject: RE: CDC Director Briefing Document.doc

Henry, if FEMA is really pulling people out of trailers that will diminish the pressure for CDC to offer early conclusions. They are already taking action based on being cautious. In the meantime, our communications program--offering best available advice and keeping the public updated on study progress--should help address concerns.
Howie

Howard Frumkin, M.D., Dr.P.H., Director
National Center for Environmental Health / Agency for Toxic Substances and Disease Registry
Centers for Disease Control and Prevention 1600 Clifton Road, MS E-28 Atlanta, GA 30333 Tel 404-498-0004 Fax 404-498-0083 E-mail hfrumkin@cdc.gov FedEx deliveries:
1825 Century Boulevard
Atlanta, GA 30345

-----Original Message-----
From: Falk, Henry (CDC/CCEHIP/OD)
Sent: Thursday, August 09, 2007 10:15 PM
To: Sinks, Tom (ATSDR/OA/OD); Frumkin, Howard (ATSDR/OA/OD); McGeehin, Mike (CDC/CCEHIP/NCEH)
Subject: Re: CDC Director Briefing Document.doc

Tom, thanks. Looks good.

Epid study results would not be available till summer 2008; you may already have considered whether any interim results/data will be of help to FEMA. I agree with need for good study, but pressure will mount in the meantime.

In news release a few days ago, FEMA indicated they will be pulling people out of trailers and stop using them; does this decision affect our work in any way?

Sent from my BlackBerry Wireless Handheld

-----Original Message-----
From: Sinks, Tom (ATSDR/OA/OD)
To: Gimson, William H. (CDC/OD)
CC: McGeehin, Mike (CDC/CCEHIP/NCEH); Frumkin, Howard (ATSDR/OA/OD); Falk, Henry (CDC/CCEHIP/OD); Rose, Kenneth (ATSDR/OPPE); Fielding, Sascha (CDC/CCEHIP/NCEH); Sinks, Tom (ATSDR/OA/OD)
Sent: Thu Aug 09 21:46:32 2007
Subject: CDC Director Briefing Document.doc

<<CDC Director Briefing Document.doc>>

Bill - here is a 2 page summary that provides you with information re our planned collaboration with DHS/FEMA. It also describes actions that we have taken to date re that collaboration. Howie is in North Carolina (RTP-EPA) tomorrow morning and is available to participate in a phone call briefing with the Secretary's office. Mike McGeehin is in town and available. Should this occur tomorrow at a time that Howie cannot attend I can substitute for him.

FYI - you should also know that last year ATSDR worked with FEMA and EPA on an consultation to examine how different ventilation technigues changed formaldehyde levels in 96 new unoccupied trailers. ATSDR released a health consultation this past March. We are currently dealing with a number of congressional committees who are interested in how we conducted that study. That evaluation has weaknesses that are the focus of the congressional inquiries. We have been evaluating it and working with CDC-W on responding to the hill. Howie and I are considering re-examining the data used and possibly issuing a reanalysis of that work. I don't think this is an issue we need to brief the secretary on - but you shuold be aware of it.

Frumkin, Howard (ATSDR/OA/OD)

From: Gimson, William H. (CDC/OD)
Sent: Friday, August 10, 2007 6:48 AM
To: Gerberding, Julie M.D. (CDC/OD); Falk, Henry (CDC/CCEHIP/OD); Frumkin, Howard (ATSDR/OA/OD); Sinks, Tom (ATSDR/OA/OD)
Subject: Re: CDC Director Briefing Document.doc

Julie - from brief discussions last eve accelerated timeline will be encouraged and the Sierra Club apparently did a related review.

Sent from my BlackBerry Wireless Device

-----Original Message-----
From: Gerberding, Julie M.D. (CDC/OD)
To: Falk, Henry (CDC/CCEHIP/OD); Frumkin, Howard (ATSDR/OA/OD); Gimson, William H. (CDC/OD); Sinks, Tom (ATSDR/OA/OD)
Sent: Fri Aug 10 05:57:58 2007
Subject: Fw: CDC Director Briefing Document.doc

Thank you for this update. This is a very complicated issue. I appreciate how much you have already accomplished! Great work.

I imagine that the Secretarry will be concerned and possibly pressured by others on our timeline. I understand why the field study takes time to organize and conduct. However, it is not clear why we can't initiate a communication plan now, or why a study panel cannot be initiated as a workgropup under the existing nceh faca committee so things can get started faster.

I realize that good science takes time, and good regulations can take an eternity. But in the meantime, this issue is festering and people in these trailors are very upset with their govetrnment. How can we do more to help them right now?

What is the Sierra study issue?

Thanks!

-----Original Message-----
From: Gimson, William H. (CDC/OD)
To: Gerberding, Julie M.D. (CDC/OD)
Sent: Thu Aug 09 22:20:11 2007
Subject: Fw: CDC Director Briefing Document.doc

Updated dod

Sent from my BlackBerry Wireless Device

-----Original Message-----
From: Frumkin, Howard (ATSDR/OA/OD)
To: Sinks, Tom (ATSDR/OA/OD); Gimson, William H. (CDC/OD)
CC: McGeehin, Mike (CDC/CCEHIP/NCEH); Falk, Henry (CDC/CCEHIP/OD); Rose, Kenneth

(ATSDR/OPPE); Fielding, Sascha (CDC/CCEHIP/NCEH)
Sent: Thu Aug 09 22:19:19 2007
Subject: RE: CDC Director Briefing Document.doc

Bill:
Please substitute the attached briefing document for the one you just received from Tom. We reviewed it and added mention of the February 2007 ATSDR study, to which Tom alluded in his cover note. As this study has attracted some congressional attention we didn't want JLG or the Secretary to be surprised, and included it. Your call as to whether it should be brought up to the Secretary tomorrow.
Howie <<CDC Director FEMA Trailer Briefing.doc>>

Howard Frumkin, M.D., Dr.P.H., Director
National Center for Environmental Health / Agency for Toxic Substances and Disease Registry
Centers for Disease Control and Prevention 1600 Clifton Road, MS E-28 Atlanta, GA 30333 Tel 404-498-0004 Fax 404-498-0083 E-mail hfrumkin@cdc.gov FedEx deliveries:
1825 Century Boulevard
Atlanta, GA 30345

From: Sinks, Tom (ATSDR/OA/OD)
Sent: Thursday, August 09, 2007 9:47 PM
To: Gimson, William H. (CDC/OD)
Cc: McGeehin, Mike (CDC/CCEHIP/NCEH); Frumkin, Howard (ATSDR/OA/OD); Falk, Henry (CDC/CCEHIP/OD); Rose, Kenneth (ATSDR/OPPE); Fielding, Sascha (CDC/CCEHIP/NCEH); Sinks, Tom (ATSDR/OA/OD)
Subject: CDC Director Briefing Document.doc

<< File: CDC Director Briefing Document.doc >>

Bill - here is a 2 page summary that provides you with information re our planned collaboration with DHS/FEMA. It also describes actions that we have taken to date re that collaboration. Howie is in North Carolina (RTP-EPA) tomorrow morning and is available to participate in a phone call briefing with the Secretary's office. Mike McGeehin is in town and available. Should this occur tomorrow at a time that Howie cannot attend I can substitute for him.

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Wright, Scott V. (ATSDR/DTEM/PRMSB)

From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Friday, August 10, 2007 9:01 PM
To: Groutt, Mike (ATSDR/OPPE)
Cc: Fielding, Sascha (CDC/CCEHIP/NCEH); Murray, Ed (ATSDR/DTEM); Holler, James S. (Jim) (ATSDR/DTEM/PRMSB); Nickle, Richard (ATSDR/DTEM/PRMSB); Wright, Scott V. (ATSDR/DTEM/PRMSB); Little, Joseph D. (ATSDR/DTEM/PRMSB)
Subject: FW: comments on FEMA chonolgy

Attachments: COMMENTS ON CHRONOLOGY OF FEMA TRAILERS.doc

Hi Mike,
Attached please find my review comments on the FEMA chronology. glad to know you are back w/ us.
Chris

COMMENTS ON
RONOLOGY OF FEM.

COMMENTS ON CHRONOLOGY OF FEMA TRAILERS

6/19/2006 & 7/13/2006: Rick Preston's association should be Office of Chief Counsel – OCC

7/2006 – 12/2006: add "ATSDR provided limited comments to the formulation of the sampling plan" at t end of the sentence

1/2007: change to read "Health Consultation was reviewed through emergency response channels consiste with handling of all other hurricane related requests:

i.e. from ATSDR/DTEM/ERT staff to
NCEH/ATSDR/OTPER Deputy Director to
NCEH/ATSDR Deputy Director to
NCEH/ATSDR Director..

This also included 2 subsequent revisions with comments from NCEH/ATSDR/OD, as well as comments from NCEH/ATSDR/OTPER."

2/1/2007: delete statement that report did not receive a senior policy & technical review (see above note).

Dr. De Rosa was not aware of the extensive senior policy and technical reviews of senior management, as outlined above, at the time he wrote the draft letter addressing the need to discuss longer term health effec

2/27/2007: add statement:

"That same day, Dr. Chris De Rosa drafted and submitted a draft letter to FEMA for Drs. Frumkin and Sinks, which expressed those concerns".

3/9/2007: add this date to read:

"Dr. Chris De Rosa, ATSDR/DTEM, at the request of Dr. Frumkin, NCEH/ATSDR/OD, forwarded the final draft FEMA letter to Dr. Mark Keim, NCEH/ATSDR/OTPER.

3/17/2007: delete the words "developed and"; change to "sent the letter to FEMA amending the transmitta letter".

It is our understanding that subsequent teleconferences & meetings were held between CDC/ATSDR and DHS/FEMA after 2/1/2007 to discuss concerns & future health investigations. These should also be included in this chronology

Vatave, Ajay (CDC/CCEHIP/NCEH)

From: Sinks, Tom (ATSDR/OA/OD)
Sent: Tuesday, September 11, 2007 10:25 AM
To: Frumkin, Howard (ATSDR/OA/OD); Falk, Henry (CDC/CCEHIP/OD); Galaska, Louise (CDC/CCEHIP/NCIPC)
Cc: Sinks, Tom (ATSDR/OA/OD); Reynolds, Barbara S. (CDC/OD/OEC)
Subject: Important: Barbara Reynolds called

Just got off the phone with Barbara Reynolds - she and Donna are preparing to brief JLG on the status of the Waxman Inquiry.

I mentioned to her that at the time of the consult we were operating under a streamlined work process to consult with EPA and FEMA on environmental sampling post Hurricane Katrina. We had many such requests. The staff involved handled this in the same fashion. NCEH/ATSDR leadership was unaware that FEMA was handling this differently (FEMA lawsuit and Council's office) and our staff did not inform us. The involved staff did get a letter from FEMA asking them to treat the information as confidential or privledged (not certain of exact wording). At one point there is an email where one of our media people was responding to a press inquiry and contacted the staff working on the health consultation. The staff wrote an email stating that they could not share any information with the communications officer or the media because of FEMAs request for confidentiality. Our staff suggested that they contact FEMA directly.

Barbara wanted to mention to JLG some of the actions we are taking or considering in response to this issue ... The 3 items I mentioned were:

1) Re-evaluate the health consultation and the analysis. Release a revision that clarifies some of the language and replaces the level of concern with a list of the various formaldehyde standards. This should be done in next couple of weeks.

2) Require that any staff contacted by a lawyer from another agency - assure that the CDC OGC is contacted.

3) Require supervisor permission and accountability for any work staff conduct that involve another agency.

Vatave, Ajay (CDC/CCEHIP/NCEH)

From: Crawford, Alan (ATSDR/DHAC/OD)
Sent: Thursday, September 13, 2007 4:55 PM
To: Sinks, Tom (ATSDR/OA/OD)
Cc: Robinson, Richard W. (ATSDR/DRO); Perlman, Gary D. (ATSDR/DRO); Khan, Ali S. (CDC/CCID/NCZVED); Cibulas, William (ATSDR/DHAC/OD); Gillig, Richard (Rick) (ATSDR/DHAC/CAPEB); Sweet, William (ATSDR/DRO); Rodenbeck, Sven (ATSDR/DHAC/CAPEB)

Greetings to all,

At approximately 1200 today I was ask by Dr. Sinks to document a meeting that took place in the JFO located in Baton Rouge, LA. To the best of my memory the meeting took place some time during the three day period of June 26 -28, 2006. A request from FEMA or EPA had gone to Dr. Frumkin for ATSDR's assistance in assessing the levels of formaldehyde in the "FEMA" trailers used to housed displaced hurricane victims. I believe this request came about due to the death of a man living in one of the small white "FEMA" trailers in a FEMA trailer park.

Since there were a number of ATSDR Environmental Health Officers (EHOs) (USPHS Commissioned Officers) at the JFO as part of the APHT-1 that was deployed to LA to assess evacuation plans of nursing homes in the area, three of us were asked to attend a meeting to discuss the FEMA trailer formaldehyde issue. Capt. Ric Robinson (now retired) taped LCDR Gary Perlman (region 1) and I to go to the meeting with him.

What I remember is, being told the man had died of complications due to diabetes, was dead about three days before the smell caught the attention of the people living in the surrounding trailers. During the meeting it was stated (I can not remember for sure if it was the FEMA, EPA or the State person) that the rumor going around at the trailer parker was that the man had died of Formaldehyde poisoning.

The ATSDR staff briefly discussed in general terms formaldehyde poisoning, and stated we could down load the Formaldehyde Fact Sheets and give them to FEMA for their use. This action was acceptable to all and the meeting was over. I thought one of the ATSDR EHOs had gone to look at the trailer where the man had died, but I believe it was either an FEMA, State health dept, or State justice dept. person.

Alan S. Crawford, REHS/RS
LCDR U.S. Public Health Service
Environmental Health Officer
ATSDR/DHAC/CAPEB Mail Stop E29
1600 Clifton Road
Atlanta, GA 30333

(W) 404.498.0485
(F) 404.498.0135
apc4@cdc.gov

FedEx Address:
NCEH/ATSDR
ATTN: Alan S. Crawford
Century Center
1825 Century Boulevard
Atlanta, GA 30345

September 21, 2007

Via U.S. First Class Mail
and Email Address: hfrumkin@cdc.gov

Howard Frumkin, M.D., Dr. P.H., Director
National Center for Environmental Health
Agency for Toxic Substances and Disease Registry
1600 Clifton Road, MS E-28
Atlanta, GA 30333

Dear Dr. Frumkin,

The purpose of my letter is two fold. First, I want to make you aware of my serious concerns regarding several critical public health issues which are in need of immediate attention. Second, I want to formally register my objections to the severe limitations you have placed on my ability to perform the duties contained in my position description. Your edict that if I "have any contact with CDCOD, with any unit of the office of the Secretary, HHS, with any unit of the executive office of the President, or with any senior level office in any other agency domestic or foreign, public or private sector or any other organizations outside the Coordinating Center" without your prior approval, eliminates one of my core responsibilities. In my view, this unreasonable restriction on communication constitutes an intentional effort to deny the public important health related information, and retaliates against me for seeking to disseminate such information.

Over the years, I have made extensive efforts to keep your office informed of our projects and the content of all proposed health alerts and consults. My office creates a written summary of the status of these and other activities on a regular basis to insure management stays well informed of our work. Yet, you claim that the inadequacy of my communication with you and your office on these issues justified your actions in stopping the flow of communication to the public. The onerous restrictions you have placed on my interactions with senior personnel outside the Coordinating Center constitute an unwarranted and an unreasonable impediment that prevents me from performing the most critical duties set forth in my position description.

On multiple occasions during the first six months of this year, you have opposed the release of information to the public on several important health issues. Your generalized response to my efforts to communicate critical information to persons and entities outside the CDC is to simply put a stop to the dissemination process. Several instances are summarized below.

1,4 Dioxane in Baby Shampoo

On February 9, 2007, a representative of the cosmetics industry objected to ATSDR's Toxicological Profile for 1,4 Dioxane (a probable human carcinogen). She indicated that the FDA did not set a regulation of 10 parts per million (PPM) for 1,4 Dioxane in cosmetics. ATSDR withdrew all materials related to 1,4 Dioxane from its website that evening at the express direction of your immediate office.

On further review, we determined the FDA had banned 1,4 Dioxane as an ingredient for cosmetics except when the substance was a by-product rather than a direct ingredient. Based on the reproductive and developmental toxicity and carcinogenicity of 1,4 Dioxane, I recommended in early **March 2007** that we issue a health alert to notify consumers that the potential for exposure to this carcinogen exists in 40% of all cosmetics, including baby shampoos. This draft notice alerted readers to the fact that products containing the precursors to 1,4 Dioxane may be contaminated, and that they may wish to consider alternative products.

My repeated requests to issue this important health alert were summarily denied by you. Instead, we were directed to place a notice to the readers of the profile and revise the Toxicological Profile for 1,4 Dioxane. During this process, I was specifically directed by your Deputy, Dr. Sinks, to have no further communications on this issue outside of the agency. This was an unwarranted limitation on my ability to perform the duties described in my position description.

Health Consultation for FEMA

In late fall of 2006, you stated that I had not kept you adequately informed of the fact we were evaluating samples from FEMA trailers for toxicity in support of EPA's efforts following Hurricane Katrina. I advised you this was the product of a routine collaboration between ATSDR and EPA for approximately 25 years.

Because of the sensitivity of emergency event activities, I began weekly reports in 1999 for all senior staff (including you) that summarized significant events in this time

sensitive programmatic area. The details regarding the work we did in support of EPA were included in these weekly reports for approximately six months following Hurricane Katrina.

In early December 2006, without my knowledge, two members of my staff were specifically directed by your office to provide a consultation on behalf of FEMA based on EPA's sampling data. You were aware of this directive based on correspondence as early as **December 4, 2006**. At the specific direction of FEMA's attorney, my two staff members did not share the information through the usual division review and approval channels, but instead provided the information to you, Dr. Sinks, and your Coordinating Office for Preparedness, Terrorism and Emergency Response.

Upon receipt of the consult on **February 27, 2007**, (completed on **February 1, 2007**), I immediately contacted your office to state my concerns regarding the limitations of the consult, especially those relating to longer-term reproductive and developmental effects as well as cancer.

Also on **February 27, 2007**, I drafted an amendment to the consult to address these longer term health concerns and forwarded them to you for your review that same day. After repeated requests to issue an amendment to the original consult, I was directed by you to forward my proposed amendment to Dr. Mark Keim, Acting Director of the Office of Preparedness, Terrorism, and Emergency Response. This letter was subsequently sent to FEMA for review over the signature of Dr. Mark Keim.

I had no further formal involvement with the FEMA consultation until a preliminary briefing for congressional staff regarding this issue in **mid July 2007**. I repeatedly cautioned you and other senior staff regarding the formaldehyde issue in FEMA trailers. On **June 1, 2007**, I wrote to you outlining my concerns. You concurred in an email response. Based on reports of acute clinical signs of formaldehyde toxicity by residents of FEMA trailers, I repeatedly requested that we initiate health interventions to interdict these exposures and symptoms. Most importantly, I pointed to the primal need to alert the trailer residents regarding all health hazards.

Following discussion on **August 8, 2007**, of the **August 7, 2007** briefing for congressional staff, on **August 10, 2007**, you assigned the lead to my division for completing the revised health consultation.

Upon receipt of Congressman Waxmen's letter of **August 24, 2007**, we have been actively assembling all the background materials related to FEMA trailers. It was during

this time that I first became aware that the scope and content of the document was specifically directed by your office. You, your Deputy, and your Office of Preparedness, Terrorism, and Emergency Response had reviewed the draft consult on at least five occasions dating back to as early as **December 2006** but took no action.

In discussing this issue at our senior staff meeting on **August 29, 2007**, you addressed the need for all staff to grasp the broader public health implications of any request we receive from outside agencies. You indicated that it was a failure of our Emergency Response Team to take into account the broader implications of the FEMA request by restricting their review to short term exposures (as directed by FEMA's Office of Legal Counsel).

As the proposed study of the trailers in the Gulf region and elsewhere went forward, I repeatedly requested, albeit without success, that health interventions be pursued to address the clinical manifestations of acute formaldehyde toxicity in residents of the trailers. I stated that such clinical signs were a "harbinger" of a pending public health catastrophe that may be "transgenerational in its impact". I stressed the importance of alerting the trailer residents to the reproductive/developmental and carcinogenic effects of formaldehyde exposure. The only response I received was that such issues should not be discussed in emails since they might be misinterpreted.

Since you provided review and comment, you must have been aware of the content and scope of the document, thus I find it troubling that the Emergency Response Team's efforts are now being identified as the underlying basis for Congressman Waxman's concerns about the Agency's conclusions in the first consultation.

Great Lakes Areas of Concern (AOC) Report (Report)

The Report has been under development for five (5) years at the request of the International Joint Commission (IJC). The Report had been extensively reviewed on two occasions - once in **2004** and again in **2006**. This review effort followed all Agency's review and clearance procedures and policies and entailed a review by 200 experts in the field. These experts included representatives of county health departments, and their counterparts in community-based organizations responsible for the oversight of these 26 AOCs.

In addition, the Report has been reviewed by all EPA managers responsible for the AOCs, state health departments of the eight Great Lakes States, the IJC, and multiple panels of their Science Advisory Board, the Great Lakes National Program Office, as

well as the National and Bi-national Executive Committees responsible for oversight of the United States Great Lakes Water Quality Agreement.

All comments on the draft have been reviewed, and a formal disposition of the comments has been developed. Throughout this period you were briefed on many occasions regarding the status of this report, its purpose and importance. In the **spring of 2005**, the Secretariat of the International Joint Commission and their Science Advisory Board visited Atlanta to brief you on their program, including this report. In **2005** and **2006**, briefings which were conducted for the IJC, EPA, Great Lakes National Program Office, the IJC Science Advisory Board, and others.

The pending release of the document was reported in our mid-year and end of year reports, in staff meetings, by email and other fora. The document was released as final in **February 2007.** As a final document, it had been formerly cleared by your Office of Science, Office of Policy, Planning, and Evaluation, all six Commissioners of the IJC, as well as their Science Advisory Board and Office of Communications.

Due to the significance of the Report, we worked long and hard with your Office of Communications (for 4/12 months) since **February of 2007** to prepare a joint webcast announcement of the release of the report in coordination with our IJC counterparts. The report was distributed to 200 points of contact in **February 2007** in accordance with all agency guidelines and policies.

At the **end of June 2007**, your Communications Director informed me that the Report was being discussed at the next Management Meeting due to potentially "alarming information" and "contradictory statements" which went undefined. In **early July 2007**, you indicated you were not aware of the release of the report and directed that the IJC-funded webcast be canceled citing "technical limitations of the report." These so-called limitations have yet to be documented

In response to inquiries at the senior staff meeting on **September 12, 2007**, I indicated that the report had been forwarded to your Deputy, Dr. Sinks, along with the disposition of his comments on the report. On **August 27, 2007**, I was informed by Dr. Sinks that he would make a decision regarding the release of the report. You then indicated that the report was being further reviewed by "consultants to the OD". I later learned that my email regarding the status of Dr. Sinks review had been deleted 10 days earlier without being read. As of **September 17, 2007**, there has been no word from your OD. This critical report remains bottled up by your office.

Recent Interactions with the Office of Security and Emergency Preparedness (OSEP/CDC)

During the past year, we briefed you on projects being coordinated through OSEP in support of the Department of Defense (DOD). We also briefed OSEP and the DOD on our current efforts and the status of this project in **May of 2007**. DOD officials expressed great interest in expanding the scope of this effort to other units within DOD and indicated that they would be scheduling further visits representing a broader range of DOD divisions. On **June 1, 2007**, I was contacted by one such individual who requested an opportunity to meet with us in Atlanta accompanied by a colleague.

This meeting was scheduled for **July 16, 2007.** I asked our staff to obtain a stated purpose and agenda of the meeting along with some background information of the second DOD official. When this was not provided by DOD, it became apparent that proper channels to arrange this visit had not been followed. I brought this to the attention of OSEP upon a receipt of subsequent emails from DOD, including a statement of purpose and an agenda for this meeting. I forwarded this to OSEP and requested that DOD arrange for the visit through OSEP/CDC.

You expressed dissatisfaction with my communication with OSEP, claiming I had "directly contacted OSEP without first informing you". As I indicated earlier in this letter, my division has prepared a weekly summary of our activities in Emergency Response and Preparedness since **1999**. Given the importance of this communication effort, I find it difficult to understand why upon receipt of the most recent report **(September 9, 2007)**, which consisted of a brief one paragraph description of concern regarding anthrax spores in Danburry, Connecticut, you directed me to take your name off the mailing list. You stated the report was "not helpful".

The requirements that you have imposed constitute a significant and unwarranted impediment in the execution of my duties. They are also contrary to my position description which clearly states that I am to independently represent the Agency in coordinating our programs both domestically and internationally. Further, as outlined above, the actions taken by your office have significantly and adversely impacted the timeframe and/or availability of important information to promote the health and safety of affected citizens who have paid for its availability.

Accordingly, I am requesting a meeting with you, and Drs. Falk and Galaska to resolve these issues, and identify a constructive path forward which removes these unwarranted limitations on my ability to perform the duties set forth in my position description, and get the various forms of public communication about serious health risks to the public.

Very truly yours,

Christopher J. DeRosa

Vatave, Ajay (CDC/CCEHIP/NCEH)

From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Saturday, October 06, 2007 3:57 PM
To: Sinks, Tom (ATSDR/OA/OD); Frumkin, Howard (ATSDR/OA/OD); Rose, Kenneth (ATSDR/OPPE); Telfer, Jana L. (CDC/CCEHIP/NCEH); Bashor, Mark M. (CDC/CCEHIP/NCEH)
Cc: Falk, Henry (CDC/CCEHIP/OD); Kashdan, Mark S. (CDC/OCOO/OD)
Subject: Re: FEMA consult

Iwas not aware that knowledge about levels of formaldehyde in RVs was common knowledge. Also I thought consideration of cost implications. Since we have now confirmed that the levels in the trailers are above "some"federal guidelines should we not consider some sort of public health interventions such as a health alert?

Sent from my BlackBerry Wireless Device

-----Original Message-----
From: Sinks, Tom (ATSDR/OA/OD)
To: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD); Frumkin, Howard (ATSDR/OA/OD); Rose, Kenneth (ATSDR/OPPE); Telfer, Jana L. (CDC/CCEHIP/NCEH); Bashor, Mark M. (CDC/CCEHIP/NCEH)
CC: Falk, Henry (CDC/CCEHIP/OD); Kashdan, Mark S. (CDC/OCOO/OD); Sinks, Tom (ATSDR/OA/OD)
Sent: Sat Oct 06 06:42:48 2007
Subject: Re: FEMA consult

Health assessments and consultations are not in this category. There is nothing influential about reconfirming past knowledge about formaldehyde levels in RVs. . An example of an influential document on formaldehyde would be a new tox profile setting a new MRL or a regulation that sets a formaldehyde level by HUD or DOT.

Sent from my BlackBerry Wireless Device

-----Original Message-----
From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
To: Frumkin, Howard (ATSDR/OA/OD); Sinks, Tom (ATSDR/OA/OD); Rose, Kenneth (ATSDR/OPPE); Telfer, Jana L. (CDC/CCEHIP/NCEH); Bashor, Mark M. (CDC/CCEHIP/NCEH)
CC: Falk, Henry (CDC/CCEHIP/OD); Kashdan, Mark S. (CDC/OCOO/OD)
Sent: Fri Oct 05 19:50:59 2007
Subject: FEMA consult

I don't know the exact criteria for designating documents influential or highly influential but I think it would be prudent to do so in this case. It could be released for public comment and peer review simultaneously and so would be available to the public and others w/o delay.

I did speak w/ Tom about this earlier today but wanted to raise this point more broadly.

Chris

Christopher T. De Rosa, M.S., Ph.D.
Director, Division of Toxicology and Environmental Medicine Agency for Toxic Substances and Disease Registry 1600 Clifton Road - Mailstop F32 Atlanta, GA 30333
(770) 488-7003

Vatave, Ajay (CDC/CCEHIP/NCEH)

From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
Sent: Sunday, October 07, 2007 8:20 PM
To: Sinks, Tom (ATSDR/OA/OD)
Subject: Re: FEMA consult

Timing is important also.

Sent from my BlackBerry Wireless Device

-----Original Message-----
From: Sinks, Tom (ATSDR/OA/OD)
To: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD); Frumkin, Howard (ATSDR/OA/OD); Rose, Kenneth (ATSDR/OPPE); Telfer, Jana L. (CDC/CCEHIP/NCEH); Bashor, Mark M. (CDC/CCEHIP/NCEH)
CC: Falk, Henry (CDC/CCEHIP/OD); Kashdan, Mark S. (CDC/OCOO/OD)
Sent: Sun Oct 07 13:18:10 2007
Subject: Re: FEMA consult

Thanks Chris. It is important to inform peolple. The issue has been broadly communicated to the public via media. More importantly, a large numbew of our staff are actively involved in a communications plan and that covers these issues. We had people from dhac iand OC in the field last week working on this.

Sent from my BlackBerry Wireless Device

-----Original Message-----
From: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD)
To: Sinks, Tom (ATSDR/OA/OD); Frumkin, Howard (ATSDR/OA/OD); Rose, Kenneth (ATSDR/OPPE); Telfer, Jana L. (CDC/CCEHIP/NCEH); Bashor, Mark M. (CDC/CCEHIP/NCEH)
CC: Falk, Henry (CDC/CCEHIP/OD); Kashdan, Mark S. (CDC/OCOO/OD)
Sent: Sat Oct 06 15:57:06 2007
Subject: Re: FEMA consult

Iwas not aware that knowledge about levels of formaldehyde in RVs was common knowledge. Also I thought consideration of cost implications. Since we have now confirmed that the levels in the trailers are above "some"federal guidelines should we not consider some sort of public health interventions such as a health alert?

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To: De Rosa, Christopher (Chris) (ATSDR/DTEM/OD); Frumkin, Howard (ATSDR/OA/OD); Rose, Kenneth (ATSDR/OPPE); Telfer, Jana L. (CDC/CCEHIP/NCEH); Bashor, Mark M. (CDC/CCEHIP/NCEH)
CC: Falk, Henry (CDC/CCEHIP/OD); Kashdan, Mark S. (CDC/OCOO/OD); Sinks, Tom (ATSDR/OA/OD)
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Subject: Re: FEMA consult

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To: Frumkin, Howard (ATSDR/OA/OD); Sinks, Tom (ATSDR/OA/OD); Rose, Kenneth (ATSDR/OPPE); Telfer, Jana L. (CDC/CCEHIP/NCEH); Bashor, Mark M. (CDC/CCEHIP/NCEH)

Vatave, Ajay (CDC/CCEHIP/NCEH)

From: Sinks, Tom (ATSDR/OA/OD)
Sent: Friday, October 12, 2007 11:40 AM
To: CDC All - NCEH/ATSDR
Cc: Falk, Henry (CDC/CCEHIP/OD); Galaska, Louise (CDC/CCEHIP/OD); Lucido, Sal (CDC/OD/OEC); Kocher, Paula L. (CDC/OCOO/OD); Sinks, Tom (ATSDR/OA/OD)
Subject: PLEASE READ - Procedures related to Outside Contacts - on behalf of Dr. Frumkin

Attachments: Final Outside Contact Procedure.doc

Final Outside Contact Procedur...

Last year, ATSDR staff were asked by FEMA to assist in evaluating levels of formaldehyde in trailers being used post Hurricane Katrna. Our staff had been working on environmental contaminations issues post-Katrina for many months. Their work was timely and highly valued by our partners. This request must not have seemed extraordinary to our staff. Once ATSDR received the data, the work proceeded rapidly and was released in an expedited manner, similar to how other post-Katrina environmental data reviews had been handled.

Unfortunately, the request was generated by FEMA lawyers attempting to respond to legal actions against FEMA. Our staff were asked to handle the EPA-generated data as confidential. They honored the request. FEMA lawyers never contacted DHHS lawyers to discuss this arrangement. NCEH/ATSDR Leadership was unaware that our staff were working directly with FEMA lawyers or that supervisors had not been directly included in the work.

We want to emphasize the value of working collaboratively with other organizations. NCEH/ATSDR cannot achieve its mission in a vacuum. At the same time, we rely on our staff to seek appropriate quidance, support and approval from their supervisors when requested to work on projects involving other organizations. We also rely on supervisors to inform the chain of command about highly sensitive projects and out-of-the-ordinary requests.

Please review the attachment which provides guidance about informing management about collaborations with organizations outside of CDC/ATSDR.

NCEH/ATSDR Procedures Regarding Official Interaction With Persons or Organizations Outside of NCEH/ATSDR

Purpose

To specify procedures for handling official contacts and interactions with individuals or organizations outside CDC/ATSDR.

Background

NCEH/ATSDR staff often work closely with staff of external organizations in the public and private sectors. Routine staff-level interactions are expected and appropriate in fulfilling NCEH/ATSDR's mission. However, employees must ensure that any official assistance provided and documents developed as a result of interactions with contacts external to CDC are approved by supervision and cleared through all appropriate levels of review per the NCEH/ATSDR Clearance Policy and Procedure and division-specific clearance guidelines

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Procedures

NCEH/ATSDR supervisors must be informed of, and concur with, their staff's assistance to outside organizations, including other federal agencies. Any reports, talking points, memoranda, or similar documents developed in response to requests from outside organizations should be approved by supervisors and cleared through all appropriate levels of review.

As stated, routine staff-level interaction with outside organizations is expected in fulfilling NCEH/ATSDR's mission. However, if an outside contact from the list below seeks an official position or statement from NCEH/ATSDR, employees should notify their supervisor and follow Division guidelines for ensuring notification of their division policy and communications contacts (if applicable) and the NCEH/ATSDR Office of the Director.

Representatives of organizations in this category include:

- Congressional staff or members of Congress;
- state legislators or legislative staff;
- government affairs/policy staff of external organizations;
- policy staff from HHS and other Federal agencies/departments;
- Office of General Counsel or other legal staff from HHS and other Federal agencies/departments, and any other outside lawyer including private, state and local;
- communications staff from HHS and other Federal agencies/departments; and
- members of the media.

Division policy and communications staff and NCEH/ATSDR offices can assist you and your supervisor in responding to inquiries from external groups. It is also important to notify these offices as they in turn are responsible for notifying various CDC and HHS offices.

Who to Contact

The below table below summarizes Office of the Director contacts to engage prior to interactions with various external organizations. If there is a potentially sensitive issue and you are not sure who to contact, please notify the Issues Management Team and they will help connect you with the appropriate office.

If you are contacted by:	**In addition to your supervisor and Division policy/communications contacts, please notify:**
Congressional staff or members of Congress	Office of Policy, Planning, and Evaluation (OPPE), Issues Management Team Sascha Fielding: *404-498-2058, SFielding@cdc.gov*
State/local legislators or legislative staff	OPPE, Issues Management Team Sascha Fielding: *404-498-2058, SFielding@cdc.gov*
Government affairs/policy staff of external organizations	OPPE, Strategic Engagements Tim Hack: *404-498-0497, THack@cdc.gov*
Policy staff from CDC, HHS, and other Federal agencies/departments	OPPE, Director Ken Rose: *404-498-0080, KRose@cdc.gov*
Office of General Counsel or other legal staff from HHS and other Federal agencies/ departments and any other outside lawyer	Office of the General Counsel (OGC): (404) 639-7200
Communications staff from CDC, HHS, and other Federal agencies/ departments	Office of Communication Jana Telfer: *404-498-0183, JTelfer@cdc.gov* Media Line: *404-498-0070, CGreen@cdc.gov*
Reporters or other members of the media	Office of Communication Media Line: *404-498-0070, CGreen@cdc.gov*

Formaldehyde Levels in FEMA-Supplied Trailers

Early Findings from the Centers for Disease Control and Prevention

Purpose

This flyer will tell you what researchers found in recent tests of indoor air in travel trailers and mobile homes supplied by the Federal Emergency Management Agency (FEMA) in your community. It will also give you information to protect your health and information about help in finding permanent housing.

Background

In December 2007 and January 2008, the Centers for Disease Control and Prevention (CDC) did testing to find out about levels of formaldehyde in the indoor air of travel trailers and mobile homes supplied by FEMA. CDC has analyzed the data from the testing and has findings that affect the health of residents living in FEMA-supplied trailers and mobile homes. **These are early findings and are not the final ones.** CDC will share more information over the next several weeks.

What did CDC find?

- In many trailers, mobile homes, and park models tested, formaldehyde levels were elevated. Levels were higher than usual in indoor air in most homes in the United States.
- Average levels of formaldehyde in all travel trailers and mobile homes were about 77 parts per billion (ppb). Breathing this much formaldehyde over time at this level can affect health.
- The formaldehyde level was probably higher in newer trailers and mobile homes when the weather was warm.
- Formaldehyde levels were different in mobile homes, park homes, and travel trailers, but all types of trailers and mobile homes tested had some high levels.

What should you do?

- Trailer and mobile home residents should try to relocate to permanent housing before summer. Families living in trailers with children, elderly persons, or persons who already have an illness like asthma should be relocated first.

CDC is a federal public health agency under the U.S. Department of Health and Human Services.

FEMA

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Agency for Toxic Substances
and Disease Registry
Atlanta, GA 30333

Memorandum

Date: October 25, 2007

From: Director, National Center for Environmental Health/Agency for Toxic Substances and Disease Registry (NCEH/ATSDR) (E-28)

Subject: 2007 Performance Assessment and Detail

To: Christopher De Rosa, Ph.D., Director, Division of Toxicology Environmental Medicine, ATSDR (F-32)

On October 22, we discussed your performance during the 2007 fiscal year. Unfortunately, you did not attend for personal reasons and requested that we hold the discussion by telephone. I agreed to accommodate your request. During that conversation, I let you know that your performance was unsatisfactory. I let you know that many of my concerns were stated in my letter to you dated October 18, 2007. I have enclosed with this memo a copy of your performance assessment.

My assessment of your performance will be forwarded to the SES/Title 42 Executive Performance Review Board for their review. I will also provide the board with copies of our recent correspondence regarding your concerns and mine. The board recommendation will be forwarded to the CDC/ATSDR Director for a final decision.

Until the final decision has been made regarding your performance review, I am detailing you to work directly with my deputy, Dr. Tom Sinks. Please report to him when you return from your trip to Italy. Dr. Sinks will work with you to identify a set of specific projects you can accomplish during the time of your detail and assign you office space. I will also be announcing your detail to staff when you return. I welcome your input on language you would prefer me to use when describing your detail.

You may contact Dr. Sinks or me should you have any questions.

Howard Frumkin, M.D., Dr.P.H.

DEPARTMENT OF HEALTH & HUMAN SERVICES

National Center for Environmental Health, CDC
Agency for Toxic Substances and Disease Registry

Date: November 8, 2007

From: Director (Acting)
Division of Toxicology and Environmental Medicine (DTEM), Agency for Toxic Substances and Disease Registry (ATSDR)

Subject: Management Notification of Highly Sensitive Issues

To: [redacted] DTEM

As you are aware, ATSDR has been working with the Department of Homeland Security, Federal Emergency Management Agency (DHS/FEMA) on issues related to the presence of formaldehyde in family housing units. As part of an investigation being conducted, it has come to our attention that staff members under your supervision conducted this work for a significant period of time without management oversight. Our understanding is that DTEM staff members failed to discuss the work with DTEM or ATSDR management based upon direction from the Office of Chief Counsel, DHS/FEMA.

Based upon a search of communications related to this issue, it is unclear what knowledge and at what time you became aware of controversial issues related to this work. If you accepted direction from subordinate staff that you could not be involved based upon direction from the Office of Chief Counsel, DHS/FEMS, I am concerned that you did not seek guidance from the Office of General Counsel, Centers for Disease Control and Prevention (OGC/CDC) about the appropriateness of this direction. If you were not aware of the progress of the work being conducted, I am concerned about the communication occurring between you as branch chief and your subordinate staff. Either interpretation of events causes me concern about the conduct of your management responsibilities.

In the future, if your staff receives direction from other federal agencies that is contrary to ATSDR policy and/or procedures, you should immediately seek guidance from OGC/CDC regarding the appropriateness of that direction. Your management responsibilities can not be suspended by direction of anyone other than your supervisor. I also encourage you to implement whatever procedures are necessary to ensure that you and higher level management are kept thoroughly informed of highly sensitive issues of this nature.

H. Edward Murray, Ph.D.

Exhibit 8	○ Same entry as 07/21/2007
10/19/2006 Exhibit 9	• Joseph Little Log – FEMA Conference Call ○ EPA completes formaldehyde sampling Columbus Day weekend, 2300 samples collected, sampling data expected to go to FEMA on Nov 13th. FEMA will provide a copy of the data to ATSDR for analysis
12/01/2006 Exhibit 10	• Email from Lenell Bryant (Contractor DHS) to members of DHS, CDC and EPA indicates the following ○ Updates provided by Rick Preston (FEMA) – raw data from EPA was received by FEMA on Thanksgiving weekend. Data was duplicated and forwarded to Scott Wright (CDC). Anticipated CDC analysis to be completed on or around December 11th, 2006 ○ It was emphasized that if media or other government agencies had questions pertaining to formaldehyde, they should be referred to FEMA OCC. • Email from Sam Coleman to Joseph Little, Scott Wright and Dr. Howard Frumkin indicates the following ○ EPA is concerned that FEMA might not be properly interpreting the data. ○ Urge ATSDR/CDC to complete it's review as soon as possible in order to provide appropriate advice to FEMA
12/02/2006 Exhibit 11	• Email from Howard Frumkin to Joseph Little and Scott Wright indicates the following ○ Indicated this was the first time (In reference to December 1st, 2006 7:30 AM email) that this effort had been brought to his attention, requests more information.
12/04/2006 Exhibit 12 Exhibit 13	• ATSDR Emergency Response Team Weekly Activities Report ○ ERT participated in the FEMA/EPA bimonthly conference call. FEMA indicated that they will send by fedex a CD of the final sampling data for review by ATSDR • Email from Joseph Little to Howard Frumkin indicates the following ○ First detailed notification with overview to Dr. Howard Frumkin that members of ATSDR, Scott Wright and Joseph Little were working with FEMA regarding formaldehyde in temporary housing units. ○ Rick Preston from FEMA, OGC, FEMA point person. ○ ATSDR's evaluation would be used to guide FEMA policy ○ ATSDR's activities related to this effort had been described in

12/4 Bi-monthly formaldehyde Conference call

	the first of the new year (2007)"
01/06/2007	• Email from Mark Keim (NCEH) to Mike Allred (NCEH) indicates the following o Mark Keim indicated that he had left copies of the DTEM health consult for formaldehyde and FEMA temporary housing units in Mike Allred's mailbox. o Mark Keim characterized the consult as a, "relatively open and shut case, that just needs to be run by OD." o Mark Keim characterized the findings as follows, "the bottom line is FEMA asked DTM to evaluate indoor air samples that were collected by EPA from temporary housing units similar to those ones used in Katrina. The bottom line of the investigation revealed that air formaldehyde levels could be significantly decreased below levels of concern, (which is in effect level associate with narrowing of the bronchi in sensitive individuals) within four days by opening the windows or using the fan to bring in fresh air."
01/08/2007 Exhibit 18	• Email from Louise Williams to Mike Allred indicates o This issue would be discussed at the issues management meeting as "DTEM Health Consultation Report involving Formaldehyde Sampling in FEMA Temporary Housing Units." • Email from Mike Allred to Joseph Little and Scott Wright indcates o Mike Allred indicates he thought the consult looked good from a content standpoint. o Mike Allred indicates that Howard Frumkin had some concerns and has asked for an executive summary and "some conclusions in the letter"
01/24/2007 Ex 19	• Joseph Little Log Notes – indicate the following o Tom Sinks Question - How will this information be used once the trailers are in use? ▪ ATSDR Response - "See first paragraph, trailers are being taken out of service" o Tom Sinks Question - Do these levels become a non-problem after time? ▪ ATSDR Response - Response – "The study involved a 14 day sampling period and was not intended to evaluate longer term formaldehyde levels. Other studies show formaldehyde levels in mobile homes decrease over time with a half life of 4 to 5 years. (referenced on page 3 of consult)"

	○ Tom Sinks Question - If the trailers are vented for X time can they be occupied later and the AC used? Or are we saying that the only safe way is to always have vents open with or without AC? ▪ ATSDR Response - "In the 96 trailers involved in the study, the ventilation method of opening windows and vents lowered the formaldehyde concentration below the level of concern for sensitized individuals. This implies that previously sensitized individuals (previously sensitized by exposure to liquid formaldehyde), not the general public, may experience symptoms in these 96 trailers, if the windows are not open."
01/31/2007	• Email from Joseph Little to Mike Allred indicates ○ Joseph Little indicates that all changes to the consult discussed with Mike Allred had been made
02/01/2007 Ex 20	• Report by ATSDR entitled "Formaldehyde Sampling at FEMA Temporary Housing Units Baton Rouge, Louisiana, September-October, 2006" issued.
02/02/2007 Ex 21	• Email from Scott Wright to Richard Nickle (Weekly Activity Update) indicates ○ On 2/1, ERT finalized and signed off on the Formaldehyde Health Consultation for FEMA In summary, the opening of windows and vents was effective in reducing formaldehyde concentrations below levels of health concern. Running the heating, ventilation and air conditioning systems did not provide adequate air exchanges to adequately reduce the formaldehyde concentrations
02/22/2007 Ex 22	• Letter mailed to CDC/W from Congressman Gene Taylor, Mississippi, expressing concern over reported health problems suffered by residents living in FEMA trailers.
02/27/2007	• Email from Chris De Rosa to Howard Frumkin indicates ○ Recent discussion between Chris De Rosa, Howard Frumkin and Tom Sinks. Chris De Rosa indicates he just learned of the consult and that he had concerns about the health consult ○ Dr. De Rosa indicated that his staff informed him that they were operating under orders from the OD. (The OD informed Dr. De Rosa that the OD had not given any directive to DTEM staff in regards to operating outside of the normal chain of command. The OD assertion was later confirmed by

	DTEM staff) o Chris De Rosa indicates that he reaffirmed their SOP with the staff and conveyed his regrets for the breakdown
Last Week of February	• Based on oral comments - staff within NCEH/ATSDR called health departments in LA and MS regarding potential concerns on formaldehyde in FEMA trailers. NCEH/ASTSDR staff indicated that state health officials informed them that state health departments did not require assistance at that time.
03/09/2007	• Email from Christopher De Rosa to Howard Frumkin and Tom Sinks indicates o FEMA trailer health consultation was developed, sent forward and signed by DTEM o DTEM staff had been directed not share the information further and not to address longer term health effects. o FEMA contacted Chris De Rosa 9 months prior about this issue, at which time Chris De Rosa reviewed a proposed statement and stated that they had neglected to address longer term risk, including cancer. o FEMA contacted the COTPER office with the same request and this was then assigned to DTEM, upon completion of the consult the staff sent their signed consultation directly to COTPER Email from Howard Frumkin to Mark Keim indicates o Howard Frumkin had been contacted by Chris De Rosa "about a week ago," with concerns that CDC/ATSDR had responded to a FEMA request about formaldehyde exposures in mobile homes and had restricted the response to acute toxicity (omitting to mention formaldehyde carcinogenicity) o Howard Frumkin indicates that a complete response would need to make reference to both acute and chronic toxicity. o Howard Frumkin indicates that it is his understanding that the initial response to FEMA came from Mark Keims office. Dr. Frumkin asks that Mark Keim follow up with a second communication to FEMA, noting our omission and correcting it • Email from Mark Keim to Howard Frumkin o Mark indicates he will follow through with the Dr. Frumkins request
05/17/2007	• Email received by Dr. Jerry Thomas (NCEH) Dr. Henry Falk from Jeff Runge, CMO, DHS, asking for further suggestions on the FEMA trailers issues.

B023
3/17

05/18/2007	• Based on FEMA enquiries, Dr. Tom Sinks recommends that ATSDR-DHAC engage if further testing of formaldehyde in FEMA trailers is carried out. Dr. Mike McGeehin is designated as the central contact person for the response if needed.
05/24/2007 Ex 24	• CDC sends out response to Congressman Gene Taylor. The response clarifies previous work conducted by ATSDR on formaldehyde levels in FEMA trailers. The letter indicates that CDC/ATSDR are also preparing further epidemiologic investigations considering formaldehyde levels and exposures in FEMA trailers
06/01/2007 6/2 Ex 25	• Email from Christopher De Rosa to Howard Frumkin indicates the following o "To my knowledge this is the third time that FEMA has approached NCEH/ATSDR requesting that we specify safe levels of exposure to formaldehyde. In two instances they specifically requested that we limit the scope of our response to short term exposures. Last fall, I was contacted by FEMA region 4 requesting that I review and approve a modified version of our Tox faqs sheet. More recently we were contacted through OPTER again requesting guidance for short term exposures only."
06/21/2007	• Teleconference held with Denton Herring, majority staff, House Committee on Homeland Security and NCEH/ATSDR staff. NCEH/ATSDR staff discussed the purpose of the original health consultation (Feb 1st, 2007) and also provided a chronology of events leading up to the issuing of the health consult
06/22/2007 Ex 26	• Email from Denton Herring (Investigator U.S. House of Representatives, Committee on Homeland Security) to Richard Weston (CDCW), indicates the following o Indicates that Chris De Rosa was contacted prior to June 2006 o Dr. De Rosa was asked to review and approve a toxicology fact sheet for formaldehyde that FEMA was preparing to issue. Dr. De Rosa advised FEMA that the fact sheet should include information about the long term effects, such as cancer, and the potential health impacts that could be incurred by sensitized individuals. FEMA never responded to Dr. De Rosa's recommendations. Dr. De Rosa was informed by FEMA that this conversation was sensitive and the subject should not be discussed with others.
07/19/2007	• House Oversight and Government Reform Committee, Chaired

	by Congressman Waxman, holds a hearing, "FEMA's Toxic Trailers". ATSDR's use of .3PPM as a level of concern is challenged. Mary DeVany, an industrial hygienist, testified that it appeared that ATSDR chose to use a baseline that is significantly above what ATSDR had identified as a level of concern, minimizing the extent of the problem in the trailers. Mary DeVany called this a violation of the professional code of ethics. • Email from William Cibulas to Howard Frumkin indicates the following o "The issue here is the Feburary 1st, 2007, Health Consultation prepared by DTEM and transmitted via Mark Keim to Patrick Preston, Office of Chief Counsel, FEMA, that identified 300 ppb as a 'level of concern' for sensitive individuals. My staff are relatively naïve to this consultation, Ken Orloff had it, but I understand from Sascha that DTEM's Scott Wright is working on a response to you. Briefly, we don't typically talk about a 'level of concern'. We consider MRLs to be screening levels with uncertainty factors built in. Therefore, exposures above an MRL do not necessarily mean that adverse health effects will occur. They are just a screen. You need to do a more thorough analysis before you can conclude that adverse health effects may be a concern. Scott will have to justify how the 300 ppb level was identified as the LOC. And as you indicate, MRLs are only for non-cancer effects. In our evaluation process, we would typically look at both the non-cancer effects and theoretical cancer risks, separately and then together (weight of evidence) in deriving our public health conclusions."
07/20/2007 Ex 28	• Internal NCEH/ATSDR Teleconference occurs to discuss the challenge to .3PPM used in the ATSDR Health Consult. It was indicated that the lead scientists on this project (Joseph Little and Scott Wright) selected this value based on ATSDR medical management guideline (Note: this value is referenced for acute exposure for sensitive individuals)
8/07/2007	• Authors of the February Health Consult (Joseph Little and Scott Wright) provide a phone briefing to representatives of the House Oversight and Government Reform Committee
8/10/2007	• Email from Dr. Sinks – OD Directive to reanalyze and reissue the February Health Consult
08/13/2007	• Dr. Frumkin briefs the House Oversight and Government Reform

	Committee • Email from Dr. Frumkin confirms the directive to rewrite the February Health Consult
08/24/2007	• Committee on Oversight and Government Reform requests additional information on the February Health Consult
October 2007	• Revised Health Consult posted on ATSDR Website
Current Status	• A briefing with Congressional oversight committee and NCEH/ATSDR staff was held on Jan. 28th, 2008 • A summary of a scientific panel report regarding formaldehyde and travel trailers has been posted the NCEH web page • Testing for formaldehyde in occupied trailers began Dec. 21st, 2007 and concluded Jan. 23rd, 2008. More than 500 trailers were tested. Contractors are in the process of completing the analysis, data sets were to be provided to CDC • Chamber testing formaldehyde and VOC emission rates on unoccupied trailer components ongoing. The draft protocol for the evaluation of formaldehyde concentrations in unoccupied trailers has been sent for external peer review, comments of peer reviewers received by CDC • Child Health Study Protocol under development • Case Series Epi All) interviews ongoing • Communication Plan - ongoing

FACT

What is formaldehyde?

Formaldehyde is a colorless, strong-smelling gas. Commonly known as a preservative in medical laboratories and mortuaries, formaldehyde is also found in other products such as chemicals, particle board, household products, glues, permanent press fabrics, paper product coatings, fiberboard, and plywood. It is also widely used as an industrial fungicide, germicide, and disinfectant.

Although the term formaldehyde describes various mixtures of formaldehyde, water, and alcohol, the term "formalin" more precisely describes aqueous solutions, particularly those containing 37 to 50 percent formaldehyde and 6 to 15 percent alcohol stabilizer.

What should employers know about formaldehyde?

The OSHA standard that protects workers exposed to formaldehyde, *Title 29 of the Code of Federal Regulations (CFR)* Part 1910.1048, and equivalent regulations in states with OSHA-approved state plans apply to all occupational exposures to formaldehyde from formaldehyde gas, its solutions, and materials that release formaldehyde. The permissible exposure limits (PELs) for formaldehyde in the workplace covered by the standard are 0.75 parts formaldehyde per million parts of air (0.75 ppm) measured as an 8-hour time-weighted average (TWA). The standard includes a second PEL in the form of a short-term exposure limit (STEL) of 2 ppm that is the maximum exposure allowed during a 15-minute period. The action level—which is the threshold for increased industrial hygiene monitoring and initiation of employee medical surveillance—is 0.5 ppm when calculated as an 8-hour TWA.

How can formaldehyde harm workers?

Formaldehyde is a sensitizing agent that can cause an immune system response upon initial exposure. It is also a suspected human carcinogen that is linked to nasal cancer and lung cancer. Acute exposure is highly irritating to the eyes, nose, and throat and can make you cough and wheeze. Subsequent exposure may cause severe allergic reactions of the skin, eyes, and respiratory tract. Ingestion of formaldehyde can be fatal, and long-term exposure to low levels in the air or on the skin can cause asthma-like respiratory problems and skin irritation such as dermatitis and itching. Concentrations of 100 ppm are immediately dangerous to health or life.

How can workers be exposed to formaldehyde?

Workers can inhale formaldehyde as a gas or vapor or absorb it through the skin as a liquid. They can be exposed during the treatment of textiles and the production of resins. Besides health care professionals and medical lab technicians, groups at potentially high risk include mortuary employees as well as teachers and students who handle biological specimens preserved with formaldehyde or formalin.

What must employers do to protect workers from formaldehyde exposure?

Airborne concentrations of formaldehyde above 0.1 ppm can cause irritation of the respiratory tract. The severity of irritation worsens as concentrations increase.

Some of the key provisions of the OSHA standard require employers to do the following:

- Identify all employees who may be exposed to formaldehyde at or above the action level or STEL through initial monitoring and determine their exposure.

- Reassign employees who suffer significant adverse effects from formaldehyde exposure to jobs with significantly less or no exposure until their condition improves. Reassignment protection can continue for up to 6 months until the employee is determined able to return to the original job or unable to return to work—whichever comes first.

- Implement engineering and work practice controls to reduce and maintain employee exposure to formaldehyde at or below the 8-hour

TWA and the STEL. If these controls cannot reduce exposure to or below the PELs, you must provide your employees with respirators.

- Label all mixtures or solutions composed of greater than 0.1 percent formaldehyde and materials capable of releasing formaldehyde into the air at concentrations reaching or exceeding 0.1 ppm. For all materials capable of releasing formaldehyde at levels above 0.5 ppm during normal use, the label must contain the works "potential cancer hazard."

- Train all employees exposed to formaldehyde concentrations of 0.1 ppm or greater at the time of initial job assignment and whenever a new exposure to formaldehyde is introduced into the work area. Repeat training annually.

- Select, provide, and maintain appropriate personal protective equipment. Ensure that employees use this equipment such as impervious clothing, gloves, aprons, and chemical splash goggles to prevent skin and eye contact with formaldehyde.

- Provide showers and eyewash stations if splashing is likely.

- Provide medical surveillance for all employees exposed to formaldehyde at concentrations at or above the action level or exceeding the STEL, for those who develop signs and symptoms of overexposure, and for all employees exposed to formaldehyde in emergencies.

Are there any recordkeeping requirements concerning employee exposures?

Employers are required to do the following regarding employee exposure records:

- Retain employee exposure records for 30 years.

- Retain employee medical records for 30 years after employment ends.

- Allow access to medical and exposure records by current and former employees or their designated representatives upon request.

How can you get more information on safety and health?

OSHA has various publications, standards, technical assistance, and compliance tools to help you, and offers extensive assistance through workplace consultation, voluntary protection programs, grants, strategic partnerships, state plans, training, and education. OSHA's *Safety and Health Program Management Guidelines* (*Federal Register* 54:3904-3916, January 26, 1989) detail elements critical to the development of a successful safety and health management system. This and other information are available on OSHA's website.

- For one free copy of OSHA publications, send a self-addressed mailing label to OSHA Publications Office, 200 Constitution Avenue N.W., N–3101, Washington, DC 20210; or send a request to our fax at (202) 693-2498, or call us at (202) 693-1888.

- To order OSHA publications online at **www.osha.gov**, go to **Publications** and follow the instructions for ordering.

- To file a complaint by phone, report an emergency, or get OSHA advice, assistance, or products, contact your nearest OSHA office under the "U.S. Department of Labor" listing in your phone book, or call toll-free at **(800) 321-OSHA (6742)**. The teletypewriter (TTY) number is (877) 889-5627.

- To file a complaint online or obtain more information on OSHA federal and state programs, visit OSHA's website.

This is one in a series of informational fact sheets highlighting OSHA programs, policies, or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to *Title 29 of the Code of Federal Regulations*. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999. See also OSHA's website at **www.osha.gov**.

OSHA
Occupational Safety and Health Administration
U.S. Department of Labor
2002

Wagner, Michael

From: Guy Morgan [gmorgan@morganusa.com]
Sent: Friday, September 02, 2005 1:55 PM
To: McCreary, Bryan
Cc: Wagner, Michael
Subject: RE: ADDITIONAL TRAVEL TRAILER CAPACITY

Mr. McCreary

We have immediately begun manufacturing your 10,000 handicapped travel trailers. We will provide you with a quote shortly including both the unit costs and the freight per mile.

Thank you for the order, you can count on us.

Guy Morgan

-----Original Message-----
From: McCreary, Bryan [mailto:Bryan.Mccreary@dhs.gov]
Sent: Friday, September 02, 2005 12:27 PM
To: Guy Morgan
Subject: RE: ADDITIONAL TRAVEL TRAILER CAPACITY

Guy,

I would like you to immediately begin manufacturing 10,000 handicapped travel trailers for us if possible. Please provide me with a quote for this and a deliver schedule. Deliveries will initially be to Baton Rouge staging area but I am sure there will end up being several, might want to give us price per mile.

Thanks,

Bryan McCrear
Contracting Officer

-----Original Message-----
From: Guy Morgan [mailto:gmorgan@morganusa.com]
Sent: Friday, September 02, 2005 1:26 PM
To: Wagner, Michael
Cc: Mccreary, Bryan
Subject: ADDITIONAL TRAVEL TRAILER CAPACITY

Mr. Wagner:

We now have additional capacity beyond what was stated in our bid. If you are in a position to place more orders now, please contact us and we will give you that information.

Guy Morgan
972/864-7300 office
800/935-0321 toll free
972/864-7321 fax
214/697-3535 cell
gmorgan@morganusa.com

Allen, Jotham

From: Sevier, Adrian
Sent: Saturday, March 18, 2006 1:57 PM
To: Martinet, Mary; Trissell, David; Broyles, Edward; Fried, Jordan
Cc: Matzen, Martin
Subject: Re: developing situation

For some reason bberry isn't recognizing attachment. Whatever testing we do, we better do it very quietly. Other thoughts are to get baselines from EPA and work with manufacturer to put them on notice and to get assurances from them. Probably stuff you're already doing.

-----Original Message-----
From: Martinet, Mary
To: Sevier, Adrian; Trissell, David; Broyles, Edward; Fried, Jordan
CC: Matzen, Martin
Sent: Sat Mar 18 12:48:52 2006
Subject: RE: developing situation

We are looking into having randome testing done. Please see attached email string

Mary Ellen Martinet
Field Attorney
228-385-7087
FEMA-1604-DR-MS

-----Original Message-----
From: Sevier, Adrian
Sent: Saturday, March 18, 2006 11:43 AM
To: Martinet, Mary; Trissell, David; Broyles, Edward; Fried, Jordan
Subject: Re: developing situation

Has there been any move to do some random sampling of the trailers - ones that haven't been occupied yet?

-----Original Message-----
From: Martinet, Mary
To: Trissell, David; Broyles, Edward; Fried, Jordan; Sevier, Adrian
Sent: Sat Mar 18 12:34:57 2006
Subject: FW: developing situation

Mary Ellen Martinet
Field Attorney
228-385-7087
FEMA-1604-DR-MS

Chawaga, David J

From: Brown, Bronson
Sent: Wednesday, March 22, 2006 12:49 PM
To: Seeds, Richard; Motter, Owen; Chawaga, David J
Subject: RE: File Search

This is helpful. I would like to get to the bottom of this and find out why OSHA never reported this to FEMA safety. I received a message this morning from Clyde Payne, OSHA, that the levels were high at the staging area for the trailers (where our staff work) however, they were relatively low once they were handed over to the public. I am very concerned as to why OSHA did not share the information with our staff. Again, we need to train all FEMA staff who are working with the trailers and may have potential exposure to formaldehyde, immediately. This should be an awareness training that is on the lines of HazCom. (No more than 30 min.) We need to have an MSDS available for staff review for the product(s) from the manufacturer. The labels that are in the trailer should be reviewed with the staff. Staff are to be instructed that prior to entering the trailers, there should be a period of time for off-gasing before conducting any work operations inside the trailers. In addition, I would like a full report on this entire issue and how we may be able to correct this situation in the future (communication, direction, etc.). Thank you. Bronson

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From: Seeds, Richard
Sent: Tuesday, March 21, 2006 6:03 PM
To: Motter, Owen; Chawaga, David J; Brown, Bronson
Subject: File Search

03.21.06 @ 1652 hours CST

Good Afternoon all

Just as a sidebar:

We conducted an electronic search of our safety drives in Jackson and In Biloxi for "formaldehyde" . Nothing until Monday of this week. This search included The JA Safety Committee Meeting minutes, the both common drives and the individual Drives with safety related info on them. No discussion, no notice of sampling, no Mention in the minutes, no sampling results, and so on. These drives have our info from last September.

In addition, I questioned the trailer site manager and his LOG boss. They stated OSHA has never informed them that we had a formaldehyde problem/concern. And you know, they have never informed me or the people who report to me.

R.C.Seeds

Wood-Hooks, Valerie

From: DeBlasio, Stephen [Stephen.Deblasio@dhs.gov]
Sent: Thursday, April 06, 2006 6:08 PM
To: Bonomo, Guy; DeBlasio, Stephen; Barbara.Russell@fluor.com; Bryant, Madeline
Cc: Woodruff, Larry; Hart, David; Sharp, Tom; Rivera-Reyes, Jorge
Subject: RE: Warning on trailers: Health conerns

Concur

steve

Stephen M. De Blasio Sr.
Housing Officer DR-1603-LA, DR-1607-LA
FEMA Joint Field Office
Baton Rouge, LA 70802
(201) 259-5773
(917) 662-9704 direct connect - 172*130069*30
Fax- (225) 267-2916

From: Bonomo, Guy [mailto:Guy.Bonomo@dhs.gov]
Sent: Thursday, April 06, 2006 4:27 PM
To: DeBlasio, Stephen; Barbara.Russell@fluor.com; Bryant, Madeline
Cc: Woodruff, Larry; Hart, David; Sharp, Tom; Rivera-Reyes, Jorge
Subject: RE: Warning on trailers: Health conerns
Importance: High

I think we can remove this as an action item once and for all!!!!!!!!!!!!!

Guy Bonomo
DHOPS Chief
AFO-NOLA
(832)588-0089 (cell)
(504)762-2069 (desk)

From: ESF-8 1603 AFO NOLA [mailto:Fema-ESF8-AFONO@dhs.gov]
Sent: Thursday, April 06, 2006 4:24 PM
To: ESF-8 1603 AFO NOLA; DeBlasio, Stephen; Barbara.Russell@fluor.com; Bonomo, Guy
Cc: Bonomo, Guy; Woodruff, Larry
Subject: RE: Warning on trailers: Health conerns

I got a call back from David Blake, Indoor Air Specialist at the Northwest Clean Air Agency in Mt. Vernon, WA. Mr. Blake told me that the warning labels from California are a generic label that are not based on measured amounts in the trailers but based on the fact that formaldehyde is used in the fiber board and some other materials used in the manufacture of the mobile homes. He also recommended the use of ventilation for the removal of odors and agreed with keeping the humidity and temperature low to help with odors caused by off gassing.

Let me know if you have additional questions.

Stewart

From: ESF-8 1603 AFO NOLA [mailto:Fema-ESF8-AFONO@dhs.gov]
Sent: Wednesday, April 05, 2006 5:52 PM
To: DeBlasio, Stephen; ESF-8 1603 AFO NOLA; Barbara.Russell@fluor.com; Bonomo, Guy
Cc: Bonomo, Guy; Woodruff, Larry
Subject: RE: Warning on trailers: Health conerns

What I have confirmed so far is that the off gassing of formaldehyde can be controlled by keeping the temperature and humidity low in the units. I am still working on what California bases their warning on. I have heard that they may put this label if there is any amount of a substance, such as a volatile organic compound like formaldehyde, even if it is below the permissible exposure limits. I'll attempt to confirm this in the morning.
Stewart

From: DeBlasio, Stephen [mailto:Stephen.Deblasio@dhs.gov]
Sent: Wednesday, April 05, 2006 3:58 PM
To: ESF-8 1603 AFO NOLA; Barbara.Russell@fluor.com; Bonomo, Guy
Cc: Bonomo, Guy; Woodruff, Larry; DeBlasio, Stephen
Subject: RE: Warning on trailers: Health conerns

It is the label as I understand

steve

Stephen M. De Blasio Sr.
Housing Officer DR-1603-LA, DR-1607-LA
FEMA Joint Field Office
Baton Rouge, LA 70802
(201) 259-5773
(917) 662-9704 direct connect - 172*130069*30
Fax- (225) 267-2916

From: ESF-8 1603 AFO NOLA [mailto:Fema-ESF8-AFONO@dhs.gov]
Sent: Wednesday, April 05, 2006 3:58 PM
To: Barbara.Russell@fluor.com; Bonomo, Guy
Cc: ESF-8 1603 AFO NOLA; Bonomo, Guy; Woodruff, Larry; DeBlasio, Stephen
Subject: RE: Warning on trailers: Health conerns

Is the concern just the warning label or is there also an odor issue?

From: Barbara.Russell@fluor.com [mailto:Barbara.Russell@fluor.com]
Sent: Wednesday, April 05, 2006 3:43 PM
To: Bonomo, Guy
Cc: ESF-8 1603 AFO NOLA; Bonomo, Guy; Woodruff, Larry; DeBlasio, Stephen
Subject: RE: Warning on trailers: Health conerns

In the meantime I told them if they had concern they should check with their doctor.

"Bonomo, Guy"
<Guy.Bonomo@dhs.gov>
04/05/2006 02:55 PM

To "ESF-8 1603 AFO NOLA" <Fema-ESF8-AFONO@dhs.gov>, "Bonomo, Guy" <Guy.Bonomo@dhs.gov>
cc "DeBlasio, Stephen" <Stephen.Deblasio@dhs.gov>, "Woodruff, Larry" <Larry.Woodruff@dhs.gov>, <Barbara.Russell@fluor.com>
Subject RE: Warning on trailers: Health conerns

Thank you from one FLA guy to another !

Guy Bonomo
DHOPS Chief
AFO-NOLA
(832)588-0089 (cell)
(504)762-2069 (desk)

From: ESF-8 1603 AFO NOLA [mailto:Fema-ESF8-AFONO@dhs.gov]
Sent: Wednesday, April 05, 2006 2:51 PM
To: Bonomo, Guy; FEMA-ESF8-AFONO
Cc: DeBlasio, Stephen; Woodruff, Larry; Barbara.Russell@fluor.com
Subject: RE: Warning on trailers: Health conerns

Guy,

I have a call into an indoor air quality specialist that I've worked with in the past. I'll also be looking at other sources and get back to you as soon as possible.

Stewart

From: Bonomo, Guy [mailto:Guy.Bonomo@dhs.gov]
Sent: Wednesday, April 05, 2006 2:42 PM
To: FEMA-ESF8-AFONO
Cc: DeBlasio, Stephen; Woodruff, Larry; Barbara.Russell@fluor.com
Subject: FW: Warning on trailers: Health conerns

Charles can you address this issue as per our earlier conversation, the units in question will be occupied shortly and I really need an expeditious response so as to quell any rumors or hysteria that may unfold.

Thanks

Guy Bonomo
DHOPS Chief
AFO-NOLA
(832)588-0089 (cell)
(504)762-2069 (desk)

From: DeBlasio, Stephen
Sent: Wednesday, April 05, 2006 2:20 PM
To: Bonomo, Guy; Woodruff, Larry
Cc: Robert.Bukowski@fluor.com; 'Barbara.Russell@fluor.com'
Subject: RE: Warning on trailers: Health conerns

Can you guys work this?

Another first.....

steve

Stephen M. De Blasio Sr.
Housing Officer DR-1603-LA, DR-1607-LA
FEMA Joint Field Office
Baton Rouge, LA 70802
(201) 259-5773
(917) 662-9704 direct connect - 172*130069*30
Fax- (225) 267-2916

From: Barbara.Russell@fluor.com [mailto:Barbara.Russell@fluor.com]
Sent: Tuesday, April 04, 2006 4:05 PM
To: Deblasio, Stephen
Cc: Robert.Bukowski@fluor.com
Subject: Fw: Warning on trailers: Health conerns

SUNO wants to know what to tell their faculty an staff about this label on the trailer. I don't know what to say.

----- Forwarded by Barbara Russell/NW/Contr/FluorCorp on 04/04/2006 03:59 PM -----

"Adrell Pinkney" <apinkney@suno.edu>
04/04/2006 03:15 PM

To <barbara.russell@fluor.com>
cc
Subject Warning on trailers: Health conems

Barbara,

Some residents are concerned about the warning labels which are on the windows of their trailers.

"Warning this trailer contains chemicals that was researched by the State of California may cause cancer, birth defects or some harm to the reproductive systems"

Please advise.

Adrell

The information transmitted is intended only for the person or entity to which it is addressed and may contain proprietary, business-confidential and/or privileged material. If you are not the intended recipient of this message you are hereby notified that any use, review, retransmission, dissemination, distribution, reproduction or any action taken in reliance upon this message is prohibited. If you received this in error, please contact the sender and delete the material from any computer. Any views expressed in this message are those of the individual sender and may not necessarily reflect the views of the company.

BONNER ANALYTICAL TESTING COMPANY

2703 OAK GROVE ROAD, HATTIESBURG, MS 39402
PHONE: (601) 264-2854 FAX: (601) 268-7084
http://www.batco.com
mailto://batco@batco.com

See Michael Kinney Copy

CASE NARRATIVE

AN EVALUATION OF FORMALDEHYDE CONCENTRATION IN THE CARLTON AND DAWN SISTRUNK FEMA TRAILER 15 DELMA STREET BAXTERVILLE, MS Thursday, April 06, 2006

1.0 INTRODUCTION

Bonner Analytical was retained by Mr. Brian Rabe, Deputy Project Manager with CH2M Hill, Inc. to investigate a complaint of elevated formaldehyde concentration in a FEMA trailer located in Baxterville, Mississippi. The trailer has been occupied by Mr. and Mrs. Sistrunk and their 4 month old daughter since February of 2006. The Sistrunks received the trailer from FEMA after their home was destroyed by hurricane Katrina. Mrs. Sistrunk is 2 months pregnant and has expressed concern for her unborn child and young daughter.

2.0 METHODOLOGY

This investigation was conducted as a preliminary range finding test in order to determine if formaldehyde levels were likely elevated. The method chosen was the Gastec Color Dosimeter Tube (91D) because results could be reported immediately.
OSHA/NIOSH validated protocols are recommended when legally defensible data are required.

3.0 ONSITE VISIT

Dr. Michael S. Bonner, with Bonner Analytical Testing Company arrived at 15 Delma Street in Baxterville, Mississippi at 1030 hours on April 5, 2006. Mrs. Dawn Sistrunk provided background information and access to the trailer.

The Sistrunks received the 8X30 Coachmen trailer from FEMA in February of 2006. Shortly after, they experienced symptoms described as burning eyes

and feeling sick. After visiting her doctor and describing symptoms, the doctor suggested that she may be exposed to formaldehyde.

Mrs. Sistrunk said that when the trailer is cool that the chemical smell is not as noticeable but in the heat of the day the smell becomes unbearable.

This trailer was manufactured by Coachmen RV Incorporated, LLC in January 2006. The trailer is a "Spirit of America SE30DBD", Model and Vehicle ID # 1TC2B969961311284

At 1050 hours, 6 passive formaldehyde dose tubes (Gastec 91D) were put in place. One tube was placed outside at a distance of 20 feet from the trailer. Five (5) tubes were placed inside the trailer as follows:

1. Right side of the master bed
2. Kitchen
3. Inside the cabinet on the right side of the master bed
4. Bunk bed in small bedroom
5. Bathroom vanity
6. Background

During the first 45 minutes of the test there was no noticeable odor detected by this observer and there was no color change in the tubes to indicate the presence of formaldehyde. At the two hour mark there was still no observed odor nor was there any color change in the dose tubes to indicate the presence of formaldehyde.

The tubes were inspected once again at 1911 hours. At this time the background sample showed no detectable formaldehyde level but each of the tubes inside the trailer gave a positive response and this investigator could detect a burning sensation in his eyes. The results were as follows:

LOCATION	AVERAGE CONCENTRATION OVER 8.35 HOURS
1. Right side of the master bed	1.2 PPM
2. Kitchen	0.96 PPM
3. Inside the cabinet on the right side of the master bed	2.4 PPM
4. Bunk bed in small bedroom	1.2 PPM
5. Bathroom vanity	1.2 PPM
6. Background	0.0 PPM

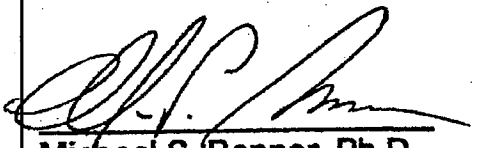
4.0 DISCUSSON AND CONCLUSION

This test was conducted over an 8.35 hour period of time. The air conditioner was turned off for this test. At the beginning of the test the inside temperature was around 70 degrees in fact, two hours into the test the trailer was still cool. At the two hour mark the outside temperature was 80 degrees and the trailer was beginning to heat up from the sun. At this time there was still no detectable levels of formaldehyde. The reported high temperature for the day was 80 degrees.

Since these test results were averaged over the entire 8.35 hour test period, it is obvious that near the end of the test formaldehyde concentrations were significantly higher than the average reported values since there was no detectable formaldehyde during the first 2 hours.

OSHA has set an exposure limit of 0.75 ppm over an 8 hour time period and a limit of 2.0 ppm for short term exposure (15 minutes). NIOSH has established a much lower limit; 0.016 ppm for 8 hours and 0.1ppm for short term exposure.

These data show that both the OSHA and NIOSH limits for formaldehyde were exceeded in this FEMA trailer.



Michael S. Bonner, Ph.D.

Nantier, Jacqueline

From: Alamia, Frank
Sent: Wednesday, May 17, 2006 6:38 PM
To: Sevier, Adrian
Cc: Nantier, Jacqueline; Martinet, Mary
Subject: FW: Formaldehyde testing

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FYI as background information you may find helpful.

From a Risk Management perspective I recommend the best NIOSH validated protocol for evaluating Formaldehyde concentrations in FEMA trailers.
Any NIOSH validated protocols are recommended because the protocols are more accurate and legally defensible in a court of law. Also an argument could be made that OSHA standards are for evaluating worker exposure, not ladies who are two months pregnant. Just a thought harkening from my days as Head of Risk Management for all the Navy Medical Department.

From: Alamia, Frank
Sent: Wednesday, May 03, 2006 12:29 PM
To: Miller, MichaelL; DeCarlo, Leonard D; Moseman, Judie
Cc: Martinet, Mary; Broyles, Edward; Melton, Sidney; Trask, Patricia C; Ross, Cembrye ; Nantier, Jacqueline
Subject: Formaldehyde testing

OGC here in Mississippi was asked to determine what the appropriate standard was for FEMA testing of Formaldehyde concentrations in our trailers here. We are not experts in Analytical testing so the legal opinion is this: **validated protocols which are legally defensible should be used**. Meaning that recognized validated industry protocols are the only protocols likely to stand up in a court of law and must be used.

I consulted with an expert in the field, Dr. Michael S. Bonner, PhD who has 40 years experience with analytical testing. There are many methods that could be used but only the OSHA and NIOSH standards would meet the legal requirements of being defensible in court. While the OSHA standards would meet the "defensible" test, from a risk management point of view they do not meet our needs. They are more designed to evaluate worker exposure in the workplace and the acceptable levels are higher than the NIOSH standards. So for example, if we are evaluating a trailer with a pregnant lady living there, the NIOSH standards better serve our purposes

The best NIOSH method according to Dr. Bonner is the NIOSH 2539 because it allows the use of a GC-MASS SPECTROMETER.

Other validated methods for formaldehyde are:

NIOSH 2541
OSHA 52
NIOSH 2016
EPA TO 11A

The methods above all use one of two types of chemistry for sample collection with detection by HPLC-UV, GC-FID, GC-MS or GC-NPD. Dr. Bonner prefers GC-MS for detection as it reduces the chance for interferences.

NIOSH 3500 is also a validated method but it is a colorimetric method and has potential for interferences.

Costs vary depending on turn around time, a 24 hour turn around time is approximately $420 where a 96 hour turn around time is about $260.
There are many other technical details but not necessary for this discussion.

Let me know if I can be of further assistance.

Frank A. Alamia

Frank A. Alamia
Attorney

U.S. Department of Homeland Security
Office of General Counsel
Joint Field Office
2350 Beach Boulevard
Biloxi, MS 39531
(228) 385-4961 Office
(703) 376-7403 Cellular
E-mail: Frank.Alamia@dhs.gov
Fax: 228-594-8573
Personal Cell: 443-880-4622

"Injustice anywhere is a threat to justice everywhere" **- Dr. Martin Luther King, Jr.**

FEMA

Allen, Jotham

From: Howell, Cindy [Cindy.Howell@dhs.gov]
Sent: Wednesday, May 31, 2006 6:53 PM
To: Hart, David; Bonomo, Guy; Blake, Martin; Dipofi, David; Boyle, Brian ; Igert, Jill; Miller, Stephen; Ringo, William; Carrigan, William
Cc: Gil, Juan; Misczak, Mark
Subject: FW: Formaldehyde

Has FEMA or an authorized representative conducted any tests to measure the formaldehyde levels in the travel trailers or mobile homes we are using?

Cindy
504.762.2082

From: Hart, David
Sent: Tuesday, May 30, 2006 10:02 AM
To: Suchodolski, Stacy; Bonomo, Guy; Howell, Cindy
Subject: RE: Formaldehyde

HQ made the determination, airing these units out would be the only steps we take. However, if an applicant comes to us with air quality testing in hand, perhaps we should take those to OGC for a determination before we act or do not act.

From: Suchodolski, Stacy
Sent: Tuesday, May 30, 2006 8:49 AM
To: Bonomo, Guy; Howell, Cindy; Hart, David
Subject: FW: Formaldehyde

Hi

Would anyone have this information?

Thanks,
Stac

From: Cox, Geraldine
Sent: Monday, May 29, 2006 3:11 PM
To: Suchodolski, Stacy
Cc: Dipofi, David; Howell, Cindy
Subject: RE: Formaldehyde

Dear Stacy:

From my discussions with the Sierra Club, they measured formaldehyde at twice the PEL for 8 hour exposure. The formaldehyde problem has also been mentioned in the school trailers by others as causing tearing eyes and other allergic problems. Do you have actual measurements from the trailers that show the trailers, especially the ones installed by Bechtel (the ones the Sierra Club reported as being the highest levels), are at a safe level? Do we have measurements in the classroom trailers? What are the values?

Geraldine (Gerry) V. Cox, Ph.D.
Environmental Specialist
FEMA
U.S. Department of Homeland Security
New Orleans Area Field Office
One Seine Court
New Orleans, LA 70114
New Cell Phone: 337-281-4251 (can take messages)
Blackberry: 504-220-1502
Office: 504-762-2358
Fax: 504-762-2876
email: geraldine.cox@dhs.gov

From: Suchodolski, Stacy
Sent: Saturday, May 27, 2006 9:28 AM
To: Cox, Geraldine
Cc: Dipofi, David; Howell, Cindy
Subject: Formaldehyde

Geraldine,

Hi

I received guidance from our IA Policy group at HQ. According to HQ there are no health concerns associated with the formaldehyde inside our FEMA MH/TT. We were given instructions to turn on the heater for an hour, then turn off the air and open all the windows and turn on the air for 48 hours. This will eliminate the smell. If you have any questions/concerns, please feel free to contact me.

Thank you,
Stacy

MEMO FOR RECORD June 2, 2006

On May 30 I received a request via e-mail from Don Ferrara, a purchasing agent at the Biloxi TRO, to provide certain information in support of a Statement of Work (SOW) to be proposed to environmental laboratories for testing FEMA trailers for formaldehyde (CH_2O) following reports of occupant complaints. The requested specifications included:

- Guidance as to when testing should be done and under what circumstances, i.e., should the trailers be ventilated a certain number of hours before samples are taken.
- Standards in determining what is considered safe levels of formaldehyde.
- A Statement of Work which will provide vendor (sic) sufficient technical information to conduct the testing based on FEMA policy and procedures.

In reviewing the available recommended exposure levels for CH_2O one first must distinguish between occupational exposure levels environmental exposure levels. Worker levels are set for reasonably healthy adults who will be away from the substance in question at least 14 hours per day. Environmental levels are set for 24 hour daily exposure to any person of any age and physical condition.

Occupational exposure levels, as used by the Sierra Club in recent testing of some few FEMA trailers, will always be too high a reference level. (It is interesting to note that the Sierra Club, probably using the OSHA sampling method, reported levels above the OSHA PEL for workers for an eight hour day.

The two available environmental exposure levels recognized in the US are the ATSDR mrl of 0.004 mg/ m^3 and the EPA 'less than one cancer in a million' level of 8 ng/m^3 which is below typical levels found in urban air. There are simple sampling methods available for both environmental levels.

Issue:

If the ASTDR level is used the likelihood is that ANY trailer manufactured within the last two months will be above the limit.

Optional actions that occur to me include:

- Completing an SOW for testing trailers which are sources of complaint, comparing results to the 0.004 mg/ m^3 level and moving occupants whose trailers exceed that level to other, preferably older, trailers.
- Instructing occupants of all trailers to air them out during hot weather by leaving the windows open whenever the trailers are un-occupied and rain is unlikely.
- Instructing occupants to leave the windows open as frequently as possible night and day, consistent with heat tolerance.
- Do a more aggressive trailer bake out either at the point of manufacture or at the staging areas.

Respectfully submitted,

William P. Ringo, Ph.D., CIH, CSP
FEMA Occupational Safety and Health Officer

Igert, Jill

From: Redfearn, Elizabeth on behalf of HQ - Lodging
Sent: Tuesday, June 13, 2006 8:25 PM
To: Fletcher, Don; Tage, Jeri
Cc: Aikman, Pam; Bratton, Lauryn C; HQ - Lodging
Subject: RE: EXTENSION DENIED: Aaron King // 1604 // 931136869
Follow Up Flag: Follow up
Flag Status: Completed

Don, thank you for your work on this one. I'm confident that the call to the applicant was challenging.

Liz

Have a great day!
Office: 940-891-8732
Cell: 940-597-3730

From: Fletcher, Don
Sent: Tuesday, June 13, 2006 8:01 PM
To: Tage, Jeri; HQ - Lodging
Cc: Aikman, Pam; Bratton, Lauryn C
Subject: RE: EXTENSION DENIED: Aaron King // 1604 // 931136869

PER YOUR REQUEST, THE APPLICANT AND THE HOTEL WERE BOTH CONTACTED AND BOTH WERE ADVISED THAT TONIGHT, JUNE 13, 2006 IS THE LAST NIGHT FOR FEMA AUTHORIZATION. I WAS UNABLE TO CONTACT THE BILLING DEPARTMENT OF THE HOTEL AS THEY WERE CLOSED FOR THE DAY BUT I TALKED TO LILLY AND SHE CONFIRMED THAT SHE UNDERSTOOD THIS WAS MR. KINGS LAST NIGHT IN THE HOTEL UNDER FEMA AUTHORIZATION. SHE SAID SHE WOULD BE SURE THAT MAY, THE GENERAL MANAGE WAS TOLD FIRST THING TOMORROW. APPLICANT WAS CONTACTED AND HE WAS ALSO ADVISED THAT HE HAS TO ASSUME RESPONSIBILITY FOR HIS HOTEL STAY AFTER TONIGHT, JUNE 13, 2006. HE WAS ADVISED THAT HIS PREVIOUS AUTHORIZATION UNTIL JUNE 21ST WAS GIVEN IN ERROR AND HAD BEEN RESCINDED. HE SAID HE HAD NO WHERE TO GO, HE WAS DYING WITH CANCER, HE WOULD NOT GO BACK TO THE TT AS HE HAD A VIOLENT REACTION TO THE FORMALDEHYDE THE SHORT TIME HE WAS IN THE TRAILER, HE COULD NOT STAY A FEW DAYS WITH HIS PARENT AS THEY WERE ALCOHOLICS AND WOULDN'T LET HIM AND HE HAD BEEN TOLD HE COULD NOT SLEEP IN HIS CAR. IT WAS SUGGESTED HE CONTACT THE LOCAL CHARITABLE ORGANIZATIONS TOMORROW FOR ASSISTANCE OR HE COULD STAY IN THE HOTEL AT HIS EXPENSE. HE SAID HE WAS RETURNING TO THE CONGRESSIONAL OFFICE TOMORROW AS THEY HAD AGREED TO FAX A REPORT OF HIS MEDICAL CONDITION AND MAKE AN APPEAL.

From: Tage, Jeri
Sent: Tuesday, June 13, 2006 6:17 PM
To: HQ - Lodging; Fletcher, Don
Cc: Aikman, Pam; Bratton, Lauryn C

Subject: RE: EXTENSION DENIED: Aaron King // 1604 // 931136869

Don,

Please call both this applicant and the hotel to inform them of the situation. Please make a clear contact in the NEMIS file (see below) that you have made both contacts. Please reply to all when this has been completed.

Thank,
Jeri

From: Redfearn, Elizabeth **On Behalf Of** HQ - Lodging
Sent: Tuesday, June 13, 2006 5:36 PM
To: Tage, Jeri
Cc: Aikman, Pam; HQ - Lodging; Bratton, Lauryn C
Subject: EXTENSION DENIED: Aaron King // 1604 // 931136869
Importance: High

Jeri,

This applicant was mistakenly extended to June 21 today. CLC and HPOP are both now corrected to June 14.

Please have someone call the applicant and hotel to advise of this correction. It is imperative that the hotel, in particular, be contacted and that it be clearly documented in NEMIS to avoid future billing issues.

The TT (park model) that he has been leased into has been cleared and our attorneys state that we have no further obligation to shelter this applicant in the hotel. It is his choice as to whether he moves into the TT, but FEMA will not pay for the hotel after tonight.

Please reply to all when this correction is completed.

Thanks,
Liz

Elizabeth M. Redfearn
Transitional Housing Unit (THU)
Hotel Population Outreach Program (HPOP)
Office: 940-891-8732
Cell: 940-597-3730
Fax: 940-323-2755
Email: elizabeth.redfearn@dhs.gov

Igert, Jill

From: Redfearn, Elizabeth on behalf of HQ - Lodging
Sent: Wednesday, June 14, 2006 3:43 PM
To: Pfleuger, Ruth; Fuimaono, Herman T
Cc: Carter, Kristy; Cedrone, Angelo; Warner, Jeannie; Bordelon, Douglas; HQ - Lodging
Subject: RE: DR 1603, #939596843 - Valerie Branch

Follow Up Flag: Follow up
Flag Status: Completed

For now, the decision is that this request is **denied.**

Thanks,
Liz

Have a great day!
Office: 940-891-8732
Cell: 940-597-3730

From: Pfleuger, Ruth
Sent: Wednesday, June 14, 2006 3:11 PM
To: Fuimaono, Herman T
Cc: Carter, Kristy; Cedrone, Angelo; Warner, Jeannie; Bordelon, Douglas; HQ - Lodging
Subject: RE: DR 1603, #939596843 - Valerie Branch

So how long does it usually take? This applicant claims she's had the windows open and a/c running for 2 weeks now and the odor and fumes are as strong as they were the first day.

Ruth
TXNPSC HPOP

From: Bordelon, Douglas
Sent: Wednesday, June 14, 2006 2:03 PM
To: HQ - Lodging; Pfleuger, Ruth
Cc: Carter, Kristy; Cedrone, Angelo; Fuimaono, Herman T; Warner, Jeannie
Subject: RE: DR 1603, #939596843 - Valerie Branch

Liz / Ruth,

See below.

Doug

From: Fuimaono, Herman T
Sent: Wednesday, June 14, 2006 2:03 PM
To: Bordelon, Douglas
Cc: Carter, Kristy; Cedrone, Angelo
Subject: RE: DR 1603, #939596843

There had been some applicants that were extended in the hotels for 2 to 3 weeks because of formaldehyde problems. Applicants had open all windows, turn on heaters, turn on A/C, yet the formaldehyde odors still lingers in the TT. These are health issues that we are talking about. If the applicants are having respiratory problems because of these odors, we

handle them from that prospective. In case somebody might sue FEMA for housing them in a formaldehyde filled TT while he/she is experiencing respiratory problems, I feel hotel extension can solve all that. So please extend them until the odor is gone.

Thank you,

Herman

From: Bordelon, Douglas
Sent: Wednesday, June 14, 2006 1:37 PM
To: HQ - Lodging; Fuimaono, Herman T
Cc: Warner, Jeannie; Pfleuger, Ruth
Subject: RE: DR 1603, #939596843

Liz,

Valerie Branch is one of Herman Fuimaono's apps.

Herman, please read below.

Thanks,
Doug

From: Redfearn, Elizabeth **On Behalf Of** HQ - Lodging
Sent: Wednesday, June 14, 2006 11:27 AM
To: Bordelon, Douglas
Cc: HQ - Lodging; Warner, Jeannie; Pfleuger, Ruth; Webbeking, Amy L
Subject: RE: DR 1603, #939596843

Doug, who is this case assigned to now?

Thanks,
Liz

Have a great day!
Office: 940-891-8732
Cell: 940-597-3730

From: Pfleuger, Ruth
Sent: Tuesday, June 13, 2006 8:55 PM
To: Webbeking, Amy L
Cc: HQ - Lodging; Warner, Jeannie
Subject: DR 1603, #939596843

I called and spoke with Ms. Branch. The maintenance issues were corrected last Saturday, but app is still in hotel because she says she can't live in the TT due to a strong odor & fumes that are causing her respiratory problems and making her eyes burn. She said she called maintenance back and the lady at the maintenance number told her it was formaldehyde residue and that formaldehyde is used in the construction of the TT's. She also stated their only resolution was to advise her to keep the windows open all the time.

Ms. Branch told me she works in Baton Rouge and returns to NOLA 2-4 days a week to work on her damaged property. She said she stays with family when she's in Baton Rouge to work.

I don't know what to do here.

rfgdf

From: Rucker, Lesli
Sent: Sunday, June 18, 2006 5:59 PM
To: Souza, Kevin
Subject: FW: FORMALDEHYDE ISSUE

Kevin – This captures the Friday AM conference call regarding the TTs. The number of applicant complaints is under 5 in Louisiana and any complaints to date in Mississippi have been addressed utilizing this approach. OGC was to have a conference call on Friday afternoon and I have yet to hear from Diane if there is anything further that they suggest needs to be addressed. Diane and field attorneys were also on the call. The logistics folks indicated that the change out will be good, clean units. I'll follow up with Diane. Lesli

---

From: Phillips, Peggy
Sent: Friday, June 16, 2006 11:36 AM
To: Miller, MichaelL; Trask, Patricia C; Aupperlee, Tracy; Burchette, Joe; Lannan, Robert; Brekke, Cheryl; Warner, Jeannie; Melton, Sidney; Gilliam Sr, Robert; Blake, Martin; Rucker, Lesli; Igert, Jill; Stark, James; Cox, Geraldine ; Hallstead, Carl; Howell, Cindy
Cc: Miller, Stephen
Subject: FORMALDEHYDE ISSUE

Good Morning Everyone,

The following is a result of the conference call this morning, Friday, 6/16/06, regarding the formaldehyde issue. At this time, it was decided that we will address this issue on an individual basis.

As needed, we will make the following suggestions to the tenant:

1. Air out the unit
2. Do not leave the unit closed up during extreme heat
3. Ensure that the air conditioning is running and properly maintained
4. As a final recommendation, we would swap out the unit for a used, renovated unit which would not present the off-gassing problems experienced in the new units

Mike Miller, Purvis Staging Area, has agreed to set aside approximately 50 units in inventory for the purpose of swapping out units with a formaldehyde problem for the renovated unit.

In the event that testing is required on a national basis, Headquarters Logistics will take the lead in maintaining a single point of contact for completion of this requirement.

Further, OGC has advised that we do not do testing, which would imply FEMA's ownership of this issue.

Gulfstream is working closely with FEMA to resolve the formaldehyde problem in the smaller travel trailer (Cavalier) units. They have offered to install an exhaust fan at their expense on a case by case

basis should this become necessary.

Jill Igert will notify us of HQ OGC's findings, and will reconvene as necessary to address this issue.

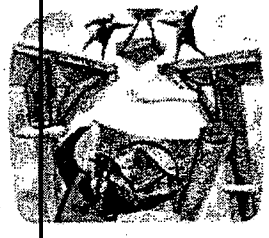
Peggy Phillips

Logistical Management Specialist

Phone: (337) 281-5629

Fax: (225) 346-5848

Peggy.Phillips@fema.gov



FEMA

Statement of Administrator Paulison

Statement on Testing of Travel Trailers and Mobile Homes for Formaldehyde

"FEMA is working with health and environmental experts to conduct a study of formaldehyde levels in emergency housing units. Our first priority has been and continues to be the health and safety of occupants. The objective of this study is to provide information so that all temporary housing unit occupants can make informed decisions about housing choices and to help FEMA and public health authorities determine further actions necessary to protect the health of residents of temporary housing units.

Over the next few weeks, the National Center for Environmental Health, an agency of the Centers for Disease Control and Prevention (CDC), will test a random, scientific sample of travel trailers in Mississippi and Louisiana and review the results for patterns and other insights into where formaldehyde is most prevalent.

We expect the testing to be conducted throughout the month of December and we will work with all residents – those that are tested and those that are not – to discuss results and housing options.

While there is no government standard for formaldehyde levels in residential settings, emphasis will be placed on accommodating residents with higher exposure levels. Every resident who has raised a concern with formaldehyde in their temporary housing unit has already been offered alternate housing.

FEMA is working to move all 52,520 households currently residing in travel trailers into permanent housing. On average, about 810 households per week leave these units for a permanent housing solution."

Background

When the Occupational Safety & Health Act was first passed in 1970, the Secretary of Labor was directed to, within two years, "promulgate as an occupational safety and health standard any national consensus standard, and any established federal standard, unless he determines that the promulgation of such a standard would not result in improved safety or health for specifically designated employees." In the event there were to be conflict among existing standards, the Secretary was required to adopt the standard that would assure the greatest degree of safety and health protection. In adopting these standards during this initial time period, OSHA was allowed to employ informal rulemaking procedures, with the added requirement that a hearing be held if any interested person objected. Thus began the reliance of OSHA on consensus standards. Since that initial requirement to adopt existing consensus standards to "jump start" the implementation of the OSH Act, safety and health professionals have had to consider the impact of theses standards with regard to both regulatory issues (compliance) and enforcement), and the potential litigation.

Congress specifically recognized the American National Standards Institute (ANSI) and the National Fire Protection Association as national consensus standards for the purposes of the Act. In addition to applying this definition to the initial "adoption" requirement, whenever OSHA promulgates a regulation that differs substantially from an existing national consensus standard, it is required that OSHA publish in the Federal Register a statement of the reasons why the rule, as adopted, will better effectuate the purposes of the OSH Act than the national consensus standard.

Setting Action Levels

It is not an option NOT to test occupied trailers. A number of informal tests have been done and results published in the media and/or reported to Congress. These results, which may be valid, have not been obtained using standardized approaches in a manner that could allow them to be generalized to all trailers. Consequently, in order to have a data set that can be used to develop a standardized approach to all applicants, the testing occupied trailers must be accomplished. This is not without risk, in that there are so many variables that influence indoor formaldehyde levels (from smoking and cooking, to how much ventilation the resident prefers), but as noted, there is not an option to not test.

If testing is done, it is clearly possible that some results could indicate levels at which it would be unconscionable to not take action. As has been discussed in earlier documents, there are no residential indoor air quality standards for formaldehyde. Much of the time since the DHS Office of Health Affairs (OHA) began assisting FEMA on this issue has been spent working with the scientific community to attempt to determine who, if anyone would be willing to establish guidance for residential indoor levels of formaldehyde. No organization will take such a stand. The National Center for Environmental Health (NCEH), a component of CDC, has acknowledged that it is CDC's responsibility, as the Federal government's public health authority, to provide a risk assessment related to indoor air quality, including formaldehyde, associated with living in FEMA emergency temporary housing, and have convened an expert panel of internationally recognized indoor air quality experts to assist in this assessment. The measurements and other information will be analyzed over the next 60 to 90 days, but there is no public health guidance from any source that will be available to assist FEMA in making immediate decisions in the interim based on actual measurements in the field.

Consequently, FEMA, assisted by the Office of Health Affairs, has determined that there is no option but to develop "Interim Action Levels" for formaldehyde in travel trailers. These are not fully scientifically and public health "vetted" levels, but are developed in recognition that it would be unethical to take measurements and have no plan for immediate action for dealing with high levels. The interim nature of these levels is emphasized and they will be re-visited and revised

based on the recommendations of NCEH as soon as soon all sampling is completed, analyzed and interpreted.

In developing interim actions levels, DHS has referred to existing voluntary consensus bodies which can be defined as domestic or international organizations that plan, develop, establish, or coordinate voluntary consensus standards using agreed-upon procedures, and have attributes of openness, balance of interest, due process, and have an appeal process. Since OSHA does not regulate the occupants of these trailers, there is no requirement that such bodies be limited to those recognized for purposes of initial promulgation of OSHA standards as in the case of ANSI and NFPA. Lacking regulatory guidance from these National Consensus Standard organizations DHS has turned to Consensus Organizations that have offered guidance in this arena. We have referenced NASA, NIOSH and ASHRAE as organizations that have issued guidance for a Short Term Exposure Limit (STEL) of 0.1 ppm and possess the above stated attributes of a voluntary consensus body. The occupant of any trailer that measures above this level will be offered alternative housing, but this does not establish that this is a "safe" or "dangerous" level as there are other standards above and below this level, only that this is a level at which there are enough consensus recommendations as to create a level of concern at which it is reasonable to offer an alternative to the resident.

We have also adopted the OSHA 8 hr limit of .75 ppm as an Interim Immediate Action Level. Federal OSHA regulations would not allow a worker to continue to work in a trailer at an exposure in excess of 0.75 ppm. Consequently, it would be unconscionable to allow someone to continue to live in a trailer in which a worker would not be allowed to work. Therefore, at 0.75 ppm, a trailer is not considered acceptable for continued habitation and the residents should be offered alternative housing as rapidly as possible. Again, this is not saying that OHA or FEMA have made a determination that trailers above this level are dangerous, only that it would not be reasonable to allow residents in a residence where workers would not be allowed to work.

The weakness of this approach is that consensus determined occupational standards cannot validly be used to determine the safety of residential exposures. Such standards are designed to provide a relative measure of protection to nominally healthy workers in a workplace environment. Occupational standards cannot easily be extrapolated to residential exposures which may range from 12-24 hours/day, and up to 7 days per week. Exposed individuals in residential environments not only include nominally healthy adults, but also the very young, the old and those with existing ailments such as immunological compromised profiles. These subpopulations may be expected to be at greater health risk to formaldehyde exposures than occupationally-exposed workers. What level of formaldehyde exposure in a residence is safe? There appears to be no lower level that is safe for <u>everyone</u>. However, the lower the concentration of formaldehyde, then the lower the risk of adverse health effects to the occupants.

There is, therefore, no assertion that these interim levels represent assessment of "safe" levels, as that is the purpose of the CDC study. These levels only represent action levels while waiting for guidance on risk associated with formaldehyde and other aspects of indoor air quality in a trailer environment.

Allen, Jotham

From: Chawaga, David J [david.chawaga@dhs.gov]
Sent: Tuesday, February 20, 2007 4:14 PM
To: Preston, Patrick; Souza, Kevin; Chawaga, David J; McNeese, Martin
Cc: Melton, Sidney; Miller, Stephen
Subject: RE: CDC Analysis of EPA Formaldehyde Testing

All

I suggest a preliminary telecom this Fri Feb 23rd at 1000 DC time

David Chawaga

From: Preston, Patrick [mailto:pepreston@dhs.gov]
Sent: Tuesday, February 20, 2007 3:48 PM
To: Souza, Kevin; Chawaga, David J; McNeese, Martin
Cc: Melton, Sidney; Miller, Stephen
Subject: RE: CDC Analysis of EPA Formaldehyde Testing

We need to mode ahead with this meeting some time soon. Someone suggest a time and place.

Patrick E. Preston, Trial Attorney
Office of Chief Counsel
Federal Emergency Management Agency
(202) 646-3825

From: Souza, Kevin [mailto:kevin.souza@dhs.gov]
Sent: Thursday, February 15, 2007 10:22 AM
To: Preston, Patrick; Chawaga, David J; McNeese, Martin
Cc: Melton, Sidney; Miller, Stephen
Subject: RE: CDC Analysis of EPA Formaldehyde Testing

Please include Sid Melton and Steve Miller on the invite for this call.

Thanks,

Kevin

From: Preston, Patrick [mailto:pepreston@dhs.gov]
Sent: Thursday, February 15, 2007 9:55 AM
To: Chawaga, David J; McNeese, Martin
Cc: Souza, Kevin
Subject: RE: CDC Analysis of EPA Formaldehyde Testing

Sure. When?

Patrick E. Preston, Trial Attorney
Office of Chief Counsel
Federal Emergency Management Agency

(202) 646-3825

From: Chawaga, David J
Sent: Tuesday, February 13, 2007 8:14 AM
To: McNeese, Martin; Preston, Patrick
Cc: 'Souza, Kevin'
Subject: RE: CDC Analysis of EPA Formaldehyde Testing

Rick – can we schedule a conf call to discuss?

Thanks

Dave

From: McNeese, Martin
Sent: Monday, February 12, 2007 10:06 PM
To: Preston, Patrick
Cc: Chawaga, David J; 'Souza, Kevin'
Subject: RE: CDC Analysis of EPA Formaldehyde Testing

Thanks Rick, I think that the report gave us what we were looking for. Changing air via external venting is effective in reducing the formaldehyde levels. I was surprised at the total ineffectiveness of vent fans in conjunction with the air conditioning since the same would be true for heating but this gives us the data to modify our instructions to our tenants to use occasional external venting via window or door to exchange air. I understand that IA program management is looking at adding formaldehyde specification to new equipment purchases but am not aware of the levels that they are looking at (the California standard would be the most published).

For our own employees in staging and unit make ready, the data for initial venting is very important to implement into our staging, receiving and unit make ready guidelines.

I am a little concerned that the CDC hung on the sensitivity level for those most sensitive to formaldehyde since that is a very, very small portion of the populous and if we seriously took it into consideration then we would leave a lot of people sleeping in their cars or on park benches when we could easily re-accommodate the special needs. But we never intended to find a risk standard only validate formaldehyde levels and effective mitigation measures.

We in IA need to ensure that our lease-in documentation includes formaldehyde facts and mitigation measures and instructions for where to call if there are sensitivities we need to accommodate. Possibly this is something that could be funded in the Gulf since there are tens of thousands of trailers still there.

From litigation I cannot speak but the tests verified most of what the manufacturers told us and we just need to tighten up a little and be more specific on the mitigation and closed unit information since we know that the air does not recirculate and there is probably not enough air exchange in heat to cause an effect without extra venting.

I am willing to discuss this whenever you are ready. Take care

Martin McNeese
FEMA Region VIII
Emergency Management Program Specialist
(303)235-4897
cell (303)941-6498
fax (303)235-4939

Ramos, Margaret

From: Ramos, Margaret
Sent: Tuesday, February 27, 2007 11:43 AM
To: Preston, Patrick
Subject: RE:

Thanks. I wanted to confirm that I was going in the same direction as you guys.

Take care.

Margaret

Margaret Ramos
Office of Chief Counsel, General Law
DHS/FEMA
202-646-4326 (voice)
202-646-3958 (fax)

From: Preston, Patrick
Sent: Tuesday, February 27, 2007 11:42 AM
To: Ramos, Margaret
Subject: RE:

Well I think the short answer has to be that you have to process the tort claim based on the standard that applies to all FTCA claims. FEMA has not identified any independent evidence of dangerous formaldehyde conditions in trailers. If the claimant hasn't provided and supporting evidence of the nature and extent of injury, then he/she has failed to satisfy their burden of proof and the claim should be denied.

Patrick E. Preston, Trial Attorney
Office of Chief Counsel
Federal Emergency Management Agency
(202) 646-3825

From: Ramos, Margaret
Sent: Tuesday, February 27, 2007 11:35 AM
To: Preston, Patrick
Subject: FW:

Hi Rick,

I have received a tort claim that has not been perfected. The claimant is making a claim for exposure to formaldehyde. I want to know if there is any strategy that has been discussed in handling these cases. The claimant had been working with individual assistance as stated in the below email. When he did not hear from them he made a tort claim.

The claimant did not submit any medical documentation to support his claim or any documentation to support that the trailer was contaminated by excess formaldehyde.

Any information you could let me know about would be appreciated.

Thanks.

Margaret

Margaret Ramos
Office of Chief Counsel, General Law
DHS/FEMA
202-646-4326 (voice)
202-646-3958 (fax)

From: DeBorja, Ramoncito
Sent: Tuesday, February 27, 2007 10:30 AM
To: Ramos, Margaret
Subject: RE:

Rick Preston

From: Ramos, Margaret
Sent: Tuesday, February 27, 2007 10:29 AM
To: DeBorja, Ramoncito
Subject: FW:

Hi Chito,

Can you let me know? Thanks.

M.

Margaret Ramos
Office of Chief Counsel, General Law
DHS/FEMA
202-646-4326 (voice)
202-646-3958 (fax)

From: Ramos, Margaret

Sent: Tuesday, February 27, 2007 10:28 AM
To: Fried, Jordan
Subject:

Hi Jordan,

Who is handling the formaldehyde suits? I have a claimant who is asserting a tort claim. He was previously working with individual assistance to apply for "Other Needs Assistance"

Thanks.

Margaret Ramos
Office of Chief Counsel, General Law
DHS/FEMA
202-646-4326 (voice)
202-646-3958 (fax)

From: Cook, Patrick
Sent: Monday, March 19, 2007 7:34 AM
To: Buras, Ryan
Subject: FW: Formaldehyde in MH and TT

FYI

Patrick J. Cook
Team Leader, Housing Operations
Individual Assistance Branch
Recovery Division
202-314-5539
202.314-5616 (fax)

From: Slaten, Andrew
Sent: Wednesday, March 14, 2007 12:19 PM
To: Cook, Patrick
Subject: Formaldehyde in MH and TT

Patrick, I am working on a congressional correspondence regarding the issue of formaldehyde in mobile home and travel trailers. I realize that due to pending legislation, we are limited in the info we can share about the testing that was done via CDC. Are you the person to speak with to get updates on the testing, its results, and what we are doing with those results? Who would have the latest info on the #s of families affected, and what actions have been taken to remediate the issue? Thanx for your help! Andrew

Andrew R. Slaten
Special Assistant
FEMA Recovery Division
500 C St. S.W.
Washington, D.C. 20472
(202)-646-3658
Andrew.Slaten@dhs.gov

FEMA

Preston, Patrick

From: Martinet, Mary
Sent: Friday, March 17, 2006 10:35 AM
To: Ross, Cembrye; Tyler, Deena; Broyles, Edward
Cc: Ramos, Margaret; Nantier, Jacqueline
Subject: FW: Couple Discovers High Levels Of Formaldehyde In FEMA Trailer

Mary Ellen Martinet
Field Attorney
228-385-7087
FEMA-1604-DR-MS

From: Martinet, Mary
Sent: Friday, March 17, 2006 8:34 AM
To: Matzen, Martin
Subject: Couple Discovers High Levels OfF ormaldehyde In FEMA Trailer

Couple Discovers High Levels Of Formaldehyde In FEMA Trailer (WLOX-TV)

WLOX-TV Biloxi (MS)
March 16, 2006

A Bay St. Louis couple has discovered a dangerous problem with their FEMA trailer. And that problem could have widespread implications to the health of anyone living in one.

Paul and Melondy Stewart say tests show there's formaldehyde inside their trailer, at levels two times what is considered acceptable by the Environmental Protection Agency.

Formaldehyde is found in a lot of building materials and the couple believes the press board used inside the trailers is creating major problems for them.

After waiting for several months, Paul and Melondy Stewart were overjoyed to finally receive a FEMA trailer in December. But almost immediately that joy left them.

"When we first moved in here we had significant symptoms which continued til today. We had burning eyes, burning nose, scratchy throats, nasal headaches, that type of thing," Paul Stewart said.

Stewart is an active environmentalist and had heard of studies on problems with formaldehyde used in trailers. He asked FEMA to test his trailer.

When FEMA didn't respond, the Stewarts took matters into their own hands. They ordered a testing kit from a lab, that specializes in toxic chemicals.

"We got the test kit. We put it inside the camper, then sent it back to them. Then they analyzed the results. The results came

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
and Prevention (CDC)
Atlanta GA 30333

March 17, 2007

Patrick Edward Preston, Trial Attorney
Office of Chief Counsel
Federal Emergency Management Agency
US Department of Homeland Security
500 C Street, SW
Washington, DC 20472

Dear Mr. Preston:

I am writing in follow-up to my previous correspondence last month on behalf of the CDC National Center for Environmental Health/Agency for Toxic Substances and Disease Registry.

It has just come to my attention that the Health Consultation "Formaldehyde Sampling at FEMA Temporary Housing Units" has been completed without a policy review by our senior technical staff. I am concerned that this health consultation is incomplete and perhaps misleading.

Formaldehyde is classified as "reasonably anticipated to be a human carcinogen. As such, there is no recognized "safe level" of exposure. Thus, any level of exposure to formaldehyde may pose a cancer risk, regardless of duration. Failure to communicate this issue is possibly misleading, and a threat to public health. I had discussed this issue several months ago in a review of the public statement derived from Toxicological Profile that FEMA proposed. I specified at that time that this statement contained no mention of the cancer risk and that should be a public health concern.

Thank you for your consideration of this issue and please feel free to contact me. Failure to speak to the long-term cancer risk regarding formaldehyde exposure irrespective of duration is of particular concern.

Sincerely,

M. Keim, MD

Mark Keim, MD
Associate Director
Office of Terrorism Preparedness and
Emergency Response
National Centers for Environmental Health/
Agency for Toxic Substances and Disease Registry

CC: Christopher T. De Rosa, M.S., Ph.D.
Director, Division of Toxicology and Environmental Medicine
Agency for Toxic Substances and Disease Registry

Howard Frumkin, MD, PhD
Director,
National Center for Environmental Health/
Agency for Toxic Substances and Disease Registry

Morris, Sandra

From: Ferguson, Robert
Sent: Wednesday, April 11, 2007 3:06 PM
To: Griffith, Keisha
Subject: FW: Revised Formaldehyde Guide line

Robert Ferguson
MHOPS Maintenance
Coordinator
Desk (228)594-3536
Cell (337)281-6764

From: Ferguson, Robert
Sent: Thursday, March 22, 2007 4:56 PM
To: Alejandro, Armando; Andrews, Michael; Camacho, Carlos; Chapman, Matthew; Cowart, Kevin; Cvitanovich, Yvette; Day, Edward; Favre, Bertie; Galloway, Jammeye; Gordon, Jesse; Gunnell, Bradley S; Hall, Ryan; Howell, Gloria; Jenkins, James; King, Brian; Ladner, Linda A; Necaise, Gertrude; Necaise, Kellie; Swilley, Terry; Thomas, Alethia B; Williams, James; Willis, Cleo; Wingo, Terry
Subject: Revised Formaldehyde Guide line

I have been asked to clarify there is no formal FEMA Formaldehyde Test; I have changed to Formaldehyde Issue.

MHOPS Field Staff,

This is the guidelines to handle applicant request for "Formaldehyde Issue".

First visit the applicant at the unit. Document your findings. Explain the procedure to ventilate the unit by opening the windows and letting the air flow. This appears to have the most positive effect.

"An analysis of the results of the formaldehyde testing on the travel trailers being used as temporary housing, in general, supported that the actions that FEMA recommended would maintain the level of formaldehyde emissions at a level where they would not cause physical discomfort to most people. The analysis also provided some information that was new to FEMA. The tests revealed that running the HVAC or air conditioner alone would not bring the average formaldehyde emissions below a level that ATSDR indicates is a level of concern for sensitive individuals, Ventilating through the external windows, even without the use of the air conditioner will maintain the average formaldehyde emissions below this level of concern. While there are no industry standards for formaldehyde levels, FEMA will use the ATSDR level of concern as a guide in our housing program."

Have the applicant ventilate for 48 hours. Schedule another site visit to check with the applicant. If the applicant feels the problem has been solved document on an IU, send to the TRO. If the applicant is still experiencing formaldehyde related problems inform the applicant we will swap the unit for a previously occupied unit that did not have any formaldehyde problems. Do swap paperwork and send to the TRO. If they decline, document on IU. Send to TRO.

Please, contact me for any questions or comments.

Robert Ferguson
MHOPS Maintenance
Coordinator
Desk (228)594-3536
Cell (337)281-6764

McNeese, Martin

From: McNeese, Martin
Sent: Monday, April 30, 2007 8:24 AM
To: 'Miller, Stephen'
Subject: RE: Fw: formaldehyde_test[1].pdf -

Hi Steve, I haven't seen this series of emails but the Sierra Club article is referencing the original test last April that prompted us to do the testing last summer. My comments regarding the sale of the units is that we are not selling them as temporary housing units but as travel trailers assuming that they are recreational vehicles (of course if they don't have a holding tank that wouldn't be true). The Sierra Club suggestions are the same as ours, ventilate the unit. I don't know what else we could do on that.

Martin McNeese
martin.mcneese@dhs.gov
Emergency Management Program Specialist
FEMA Region VIII
(303)235-4897
fax (303)235-4939
cell (303)941-6498
pager 1-800-759-8888 pin 1634815
--Leaders don't attain greatness by giving orders,
but by serving others

From: Miller, Stephen [mailto:stephen.miller1@dhs.gov]
Sent: Monday, April 30, 2007 6:15 AM
To: McNeese, Martin
Subject: FW: Fw: formaldehyde_test[1].pdf -

Have you been involved in this?

From: david.robbins@gsa.gov [mailto:david.robbins@gsa.gov]
Sent: Tuesday, April 24, 2007 9:14 AM
To: Chawaga, David
Cc: cheryl.hall@gsa.gov; Menefee, Garland; Alston, Marilyn; mark.brantley@gsa.gov; Lyle, Mary Anne; Preston, Patrick; sharon.chen@gsa.gov; Miller, Stephen; genni.brown@gsa.gov; joe.hvorecky@gsa.gov
Subject: RE: Fw: formaldehyde_test[1].pdf -

David.....

I've attached the article initially provided to us.....

Dave

David M. Robbins
Director
Office of Personal Property Management
GSA, Federal Acquisition Service
703-605-5609

Mark,
A donee sent the attached article. Is there anything to it?
Gary

From: Mary T. Price [mailto:mtprice1@darientel.net]
Sent: Monday, April 23, 2007 9:04 AM
To: Parker, Gary
Subject: formaldehyde_test[1].pdf - Adobe Acrobat Professional

Have you seen this re FEMA trailers?

Allen, Jotham

From: Chawaga, David J [david.chawaga@dhs.gov]
Sent: Tuesday, May 01, 2007 11:00 PM
To: Walker, Mary-Margaret; Wade, Pam; Melton, Sidney; Smith, George; Miller, Stephen; Brown, Bronson; Cook, Patrick; Chawaga, David J; McNeese, Martin; Misczak, Mark
Cc: DeBorja, Ramoncito; Williams, Pamela; Preston, Patrick; McIntyre, James; Gee, Dianna; Widomski, Michael
Subject: RE: Draft Formaldehyde News Release
Follow Up Flag: Follow up
Flag Status: Red

Hi Mary Margaret

My comments include:

1. *Para 6: According to the Department of Health and Human Services' Agency for Toxic Substances and Disease Registry (ATSDR), after the fourth day of sampling, the average concentration of formaldehyde per day for the trailers utilizing open window ventilation had dropped below the level of health concern for sensitive individuals. Average, per-day levels in the other group of trailers remained above the level of concern for sensitive individuals of 0.3 ppm (369ug/m3) for all but two days of the test period. ATSDR analyzed the sampling data for FEMA*

   We need to reference the Agency or organization who determined 0.3 ppm as the "level of health concern for sensitive individuals". This level is not found on public web sites, which is the main source of reference material, and may lead to confusion (see below):

   - The known employee airborne concentration of formaldehyde is 0.75 ppm as an 8-hour time weighted average
   - The EPA states: "Formaldehyde, a colorless, pungent-smelling gas, can cause watery eyes, burning sensations in the eyes and throat, nausea, and difficulty in breathing in some humans exposed at elevated levels (above 0.1 parts per million). High concentrations may trigger attacks in people with asthma. There is evidence that some people can develop sensitivity to formaldehyde. It has also been shown to cause cancer in animals and may cause cancer in humans."
   - The National Institute for Occupational Safety and Health (NIOSH) recommends an exposure limit of 0.016 ppm.
   - According to the U.S. Consumer Product Safety Commission (CPSC), as few as 0.1 parts per million (ppm) of formaldehyde in air can cause watery eyes, burning sensations in the eyes, nose and throat, stuffy nose, nausea, coughing, chest tightness, wheezing, skin rashes and allergic reactions. The EPA says, "It has also been shown to cause cancer in animals and may cause cancer in humans."
   - National Safety Counsel: Formaldehyde is normally present at low levels, usually less than 0.06 ppm (parts per million), in both outdoor and indoor air. When present in the air at levels at or above 0.1 ppm, acute health effects can occur including watery eyes; burning sensations in the eyes, nose and throat; nausea; coughing; chest tightness; wheezing; skin rashes; and other irritating effects. Formaldehyde affects people in various ways. Some people are very sensitive to formaldehyde while others may have no noticeable reaction at the same level of exposure. Sensitive people can experience symptoms at levels below 0.1 ppm. The World Health Organization recommends that

exposure should not exceed 0.05 ppm. Colds, flu, and allergies can cause symptoms similar to some of those produced by exposure to formaldehyde.

2. Para 5: *A baseline for concentrations of formaldehyde in the trailers was established and samples were collected from two different groups of trailers each using a different method of ventilation.*

Was there a baseline established prior to the sampling, if so should we state it?

Thanks, please don't hesitate to contact me if you have any questions.
David Chawaga

From: Walker, Mary-Margaret [mailto:mary-margaret.walker@dhs.gov]
Sent: Tuesday, May 01, 2007 4:44 PM
To: Wade, Pam; Melton, Sidney; Smith, George; Miller, Stephen; Brown, Bronson; Cook, Patrick; Chawaga, David J; McNeese, Martin; Misczak, Mark
Cc: DeBorja, Ramoncito; Williams, Pamela; Preston, Patrick; McIntyre, James; Gee, Dianna; Widomski, Michael
Subject: Draft Formaldehyde News Release
Importance: High

Please comment by noon Eastern on Wednesday, May 2, please, if at all possible. There will be more materials...just wanted to start working this through the system. Thanks so much.

Mary Margaret Walker
FEMA Public Affairs
Washington, DC
202-646-3892

Preston, Patrick

From: DeBorja, Ramoncito
Sent: Wednesday, May 02, 2007 3:51 PM
To: 'Williams, Pamela'
Cc: Preston, Patrick
Subject: FW: Draft Formaldehyde News Release

Pam – I just wanted to make sure that you were coordinating w/ Mary Margaret on her press release.

Thanks,

Chito

From: McNeese, Martin
Sent: Wednesday, May 02, 2007 12:10 PM
To: Walker, Mary-Margaret; Chawaga, David J; Miller, Stephen; Brown, Bronson; Preston, Patrick
Cc: DeBorja, Ramoncito; Williams, Pamela
Subject: RE: Draft Formaldehyde News Release

I agree with Mary-Margaret that we need to state the numbers. I have tried to stay with data from the ATSDR report and not re-analyze or interpret since that keeps us out of the scientific arena. I used the term baseline because that it what ATSDR used and I think it is more universally understood than T0-Initial as the test plan used. The .3 ppm reference is also out of the ATSDR report. We cannot stop people from arguing that it is good or bad but it is the reference provided to us. I think that the positives are that we are adapting our practices to reduce the formaldehyde concentrations and provide meaningful information to the occupants of our units and will be acquiring any new units, if necessary to the HUD standard for materials.

Mary-Margaret, I polled the Gulf offices in early March for more updated numbers of units replaced for formaldehyde complaints and could not get anything newer. It's a weak link but also one of the reasons that we are implementing a more formal process for handling complaints into the housing operations.

Martin McNeese

martin.mcneese@dhs.gov

Emergency Management Program Specialist

FEMA Region VIII

(303)235-4897

fax (303)235-4939

cell (303)941-6498

pager 1-800-759-8888 pin 1634815

--Leaders don't attain greatness by giving orders,

but by serving others

From: Walker, Mary-Margaret
Sent: Wednesday, May 02, 2007 9:02 AM
To: Chawaga, David J; Miller, Stephen; Brown,B ronson; Preston, Patrick; McNeese, Martin
Cc: DeBorja, Ramoncito; Williams, Pamela
Subject: RE: Draft Formaldehyde News Release

In my view we need to be able to state the results – if we don't that will be the first question we get. The best thing would be if we could release the entire report. There is considerable discussion of formaldehyde toxicity referencing ATSDR; the National Library of Medicine, Hazardous Substances Substances Data Bank; the EPA, Formaldehyde Sampling at FEMA Temp Housing Units'; FEMA's field documentation; and the American Conference of Government Industrial Hygienists...

From: Chawaga, David J
Sent: Wednesday, May 02, 2007 10:53 AM
To: Walker, Mary-Margaret; Miller, Stephen; Brown, Bronson; Preston, Patrick; McNeese, Martin
Subject: RE: Draft Formaldehyde News Release

HI

I guess I'm a little concerned about this paragraph. 0.3 ppm is high according to information available to the public – the statement that HCOH dropped below 0.3 is not necessarily good news – do we have state the quantitative results? Could we state that HCOH was reduced and leave it at that?

When we say baseline – is this the average level?

Also did FEMA learn or was FEMA informed by CDC?, we may want to state that FEMA was informed – thereby placing FEMA as receiving data not generating it

Was the ADSTR reference from CDC? – if so we must verify from ADSTR that 0.3 ppm is the level for sensitive people – who was our contact at CDC?

Thanks

dc

From: Walker, Mary-Margaret
Sent: Wednesday, May 02, 2007 10:39 AM
To: Melton, Sidney; Smith, George; Miller, Stephen; Brown, Bronson; Cook, Patrick; Chawaga, David J; Misczak, Mark; DeBorja, Ramoncito; Williams, Pamela; Preston, Patrick; Wade, Pam; McNeese, Martin
Subject: FW: Draft Formaldehyde News Release
Importance: High

The baseline information of 1.2 ppm was taken Martin McNeese's summary e-mailed to Andrew Slaten on March 21 for use in answering a letter from Sen. Waxman. That figure was not in the ATSDR Report...therefore I'm revising to reflect FEMA as the source for that information, please review carefully:

In a *review??* of the test results, FEMA learned that the baseline level of formaldehyde in the units, which had been closed for approximately six weeks before the sampling, was around 1.2 ppm (parts per million). According to the Department of Health and Human Services' Agency for Toxic Substances and Disease Registry (ATSDR), which analyzed the sampling data for FEMA, the average concentration of formaldehyde per day in the units using open window ventilation dropped below the level of the 0.3 ppm level of health concern for sensitive individuals and for the remainder of the study. Average, per-day levels in the test group of trailers using air conditioning only with one open static vent in the bathroom, for all but two days of the test period remained above the 0.3 ppm measure of health concern for sensitive individuals.

From: Walker, Mary-Margaret
Sent: Wednesday, May 02, 2007 9:48 AM
To: Wade, Pam; Melton, Sidney; Smith, George; Miller,S tephen; Brown, Bronson; Cook, Patrick; Chawaga, David J; 'McNeese, Martin'; Misczak, Mark; DeBorja, Ramoncito; Williams, Pamela; Preston, Patrick
Cc: McIntyre, James; Gee, Dianna; Widomski, Michael
Subject: FW: Draft Formaldehyde News Release
Importance: High

Revised language per David Chawaga's comments:

According to the Department of Health and Human Services' Agency for Toxic Substances and Disease Registry (ATSDR), the initial baseline level of formaldehyde concentration in travel trailers was significantly higher, around 1.2 ppm (parts per million), than those that were ventilated with open windows for four days. As soon as the open window ventilating process began, formaldehyde levels began

Garratt, David

From: Garratt, David
Sent: Thursday, May 17, 2007 8:31 PM
To: 'Jon.Krohmer@dhs.gov'
Cc: 'jeff.runge@dhs.gov'; 'bill.lang@dhs.gov'; 'merritt.lake@dhs.gov'; Dannels, Donna; Souza, Kevin; Wells, Tod; 'gil.jamieson@dhs.gov'; McQueeney, Michelle
Subject: Re: CBS Evening News on formaldehyde in FEMA trailers

Thanks, Jon. Appreciate your engagement.

Dave

-----Original Message-----
From: Krohmer, Jon <Jon.Krohmer@dhs.gov>
To: Garratt, David <david.garratt@dhs.gov>
CC: Runge, Jeff; Lang, William L Dr; Lake, Merritt
Sent: Thu May 17 17:58:27 2007
Subject: FW: CBS Evening News on formaldehyde in FEMA trailers

Dave: I am forwarding comments from one of our Associate Chief Medical Officer and our public health officers for you review. I have not yet been able to closely review (have skimmed it) but wanted to get some initial information to you. I have also talked preliminarily with a medical toxicologist who indicated that there have been minor concerns about issues of this sort for many years but nothing has been substantiated.

Another issue that must come into consideration is the effect of many other "environmental factors" as a result of the changes that have occurred secondary to the hurricanes (e.g. molds, dust, etc) that may contribute to potential respiratory problems.

We would have started with the same folks at the CDC whom you have already contacted.

Just downloaded the information from Congress and will look at that tonight.

Please understand that these are preliminary comments - more to follow.

Let me know if you have other specific questions.

Thanks. JK

Jon R. Krohmer, MD, FACEP
Deputy Assistant Secretary and
Deputy Chief Medical Officer
Office of Health Affairs
Department of Homeland Security
202 254-5762 phone
202 254-6094 fax
jon.krohmer@dhs.gov

-----Original Message-----
From: Lang, William L Dr
Sent: Thursday, May 17, 2007 2:46 PM
To: Krohmer, Jon
Subject: RE: CBS Evening News on formaldehyde in FEMA trailers

Jon-

I went through the report and added some comments and questions I think we need to have answers for and as it turns out, Merritt is one of the world's experts on formaldehyde in mobile homes. He has studied the issue extensively, has been involved in testing and test analysis, and has been called as an expert witness in a number of court cases. Our

initial conversation noted the following:

- Formaldehyde is a "Suspected Human Carcinogen" but never proven and formaldehyde is naturally produced at low levels within the human body.
- Exposure levels as stated in the paper (.3 ppm) are for adults. Kids tend to be much more sensitive, but there have never been good studies addressing maximum short term exposure levels in kids.
- In the news story, they cite a Sierra Club study showing levels of .1 ppm in a study of travel trailers. That is not at all surprising in a trailer that has "buttoned up" for any period of time before being aired out.
- The story says they sampled a trailer and got a reading of .17 ppm. More data would be needed about how this reading was done to know the validity. There are meters with claimed accuracy of .05 ppm in the range of 0-30 ppm, but many things can creat a instanteous spot reading that is higher than the effective level (temperature, distance from an off-gassing item, etc.). Of note, the story says the EPA limit is 1 ppm. EPA only sets outdoor limits for substances. The indoor safety level is determined by NIOSH and that is 0.3 ppm.

Merritt is dissecting the science of this now.

-Bill

-----Original Message-----
From: Krohmer, Jon
Sent: Thursday, May 17, 2007 12:37 PM
To: Lang, William L Dr
Subject: FW: CBS Evening News on formaldehyde in FEMA trailers

Will call you about this soon. Thanks.

Jon R. Krohmer, MD, FACEP
Deputy Assistant Secretary and
Deputy Chief Medical Officer
Office of Health Affairs
Department of Homeland Security
202 254-5762 phone
202 254-6094 fax
jon.krohmer@dhs.gov

-----Original Message-----
From: Garratt, David [mailto:david.garratt@dhs.gov]
Sent: Thursday, May 17, 2007 12:36 PM
To: Krohmer, Jon; Johnson, Harvey E; Runge, Jeff
Cc: Sweet, Chad; bennett.waters@dhs.gov; Knocke, William R; Krohmer, Jon; m.jackson@dhs.gov; Paulison, Robert David; Souza, Kevin; Jamieson, Gil; Trissell, David; McQueeney, Michelle; Philbin, John
Subject: RE: CBS Evening News on formaldehyde in FEMA trailers

Jon:

The CDC report is attached.

Dave

-----Original Message-----
From: Garratt, David
Sent: Thursday, May 17, 2007 12:33 PM
To: 'Krohmer, Jon'; Johnson, Harvey E; Runge, Jeff
Cc: Sweet, Chad; bennett.waters@dhs.gov; Knocke, William R; Krohmer, Jon; Jackson, Michael; Paulison, Robert David; Souza, Kevin; Jamieson, Gil; Trissell, David; McQueeney, Michelle; Philbin, John

Subject: RE: CBS Evening News on formaldehyde in FEMA trailers

Thanks, Jon. Am out at the mountain today, but staff are working to pull that background information together. Expect it soon, and will forward.

Dave

-----Original Message-----
From: Krohmer, Jon [mailto:Jon.Krohmer@dhs.gov]
Sent: Thursday, May 17, 2007 12:30 PM
To: Garratt, David; Johnson, Harvey E; Runge, Jeff
Cc: Sweet, Chad; bennett.waters@dhs.gov; Knocke, William R; Krohmer, Jon; Jackson, Michael; Paulison, Robert David; Souza, Kevin; Jamieson, Gil; Trissell, David; McQueeney, Michelle; Philbin, John
Subject: RE: CBS Evening News on formaldehyde in FEMA trailers

Dave: I will help to coordinate this from our side, working with you and Kevin. Do you have the information from the CDC that was worked up before? A copy of that information / report will be helpful. I'm also working on some add'n CDC contacts as well as getting some additional information from toxicologist folks. Thanks. JK

Jon R. Krohmer, MD, FACEP
Deputy Assistant Secretary and
Deputy Chief Medical Officer
Office of Health Affairs
Department of Homeland Security
202 254-5762 phone
202 254-6094 fax
jon.krohmer@dhs.gov

-----Original Message-----
From: Garratt, David [mailto:david.garratt@dhs.gov]
Sent: Thursday, May 17, 2007 12:27 PM
To: Johnson, Harvey E; Runge, Jeff
Cc: Sweet, Chad; bennett.waters@dhs.gov; Knocke, William R; Krohmer, Jon; m.jackson@dhs.gov; Paulison, Robert David; Souza, Kevin; Jamieson, Gil; Trissell, David; McQueeney, Michelle; Philbin, John
Subject: RE: CBS Evening News on formaldehyde in FEMA trailers

Dr. Runge: Am interested in reaching out to CDC to engage them in evaluating and either affirming or invalidating the merits of the claims. Can you recommend a CDC POC, and does your office have contact information?

Thanks.

Dave

-----Original Message-----
From: Johnson, Harvey E
Sent: Thursday, May 17, 2007 12:00 PM
To: Runge, Jeff
Cc: Sweet, Chad; bennett.waters@dhs.gov; Knocke, William R; Krohmer, Jon; 'Jackson, Michael'; Paulison, Robert David; Souza, Kevin; Garratt, David; 'Jamieson, Gil'; Trissell, David; McQueeney, Michelle; 'Philbin, John (Pat)'
Subject: RE: CBS Evening News on formaldehyde in FEMA trailers

Jeff - We have a number of people scrambling to be helpful in this endeavor. To bring order from a FEMA perspective, I have asked Dave Garratt to be the single programmatic point of coordination on this issue. Dave can ensure access and coordination across all of FEMA. He has designated Kevin Souza as his project officer as Kevin has a depth of familiarity with all that we have done to examine the issue since it

surfaced for the first time several months ago. Kevin can access the details of the CDC study and all that we have done with EPA and others. He is also aware of the relevant changes to our specifications for the future acquisition of temporary housing.

If you have similar points of contact, we can arrange quick connection. You and your staff will be able to bring a fresh perspective and we invite that assistance.

Harvey

-----Original Message-----
From: Jackson, Michael [mailto:m.jackson@dhs.gov]
Sent: Thursday, May 17, 2007 11:47 AM
To: Runge, Jeff; Johnson, Harvey E; Jackson, Michael; Paulison, Robert David
Cc: Sweet, Chad; bennett.waters@dhs.gov; Knocke, William R; Krohmer, Jon
Subject: Re: CBS Evening News on formaldehyde in FEMA trailers

Jeff: good please work with FEMA to craft a communications strategy that is science-based and proactive. Let's not let this become a Hill issue also if we stand on firm science. I know we had a small spate of this story about a year ago. Thanks.

Sent from my BlackBerry Wireless Handheld

----- Original Message -----
From: Runge, Jeff <Jeff.Runge@dhs.gov>
To: Johnson, Harvey E; m.jackson@dhs.gov; Paulison, Robert David; Johnson, Harvey E
Cc: Sweet, Chad <Chad.Sweet@dhs.gov>; bennett.waters@dhs.gov <bennett.waters@dhs.gov>; Knocke, William R <William.R.Knocke@dhs.gov>; Krohmer, Jon <Jon.Krohmer@dhs.gov>
Sent: Thu May 17 11:33:03 2007
Subject: RE: CBS Evening News on formaldehyde in FEMA trailers

Harvey,

The CDC was exactly the right place to go for that - it's where I would start. We'd be very happy to review the methods and results and give you whatever advocacy we can.

Jeffrey W. Runge, MD

Assistant Secretary for Health Affairs (Acting)

and Chief Medical Officer

U.S. Department of Homeland Security

202-254-6479

jeff.runge@dhs.gov

-----Original Message-----
From: Johnson, Harvey E [mailto:harvey.e.johnson@dhs.gov]
Sent: Thursday, May 17, 2007 11:04 AM
To: m.jackson@dhs.gov; Runge, Jeff; Paulison, Robert David; Johnson,

Harvey E
Cc: Sweet, Chad; bennett.waters@dhs.gov; Knocke, William R
Subject: RE: CBS Evening News on formaldehyde in FEMA trailers

We've previously had CDC conduct a study. Welcome fresh look from Jeff and his team.

-----Original Message-----

From: Jackson, Michael [mailto:m.jackson@dhs.gov]

Sent: Thursday, May 17, 2007 10:41 AM

To: Runge, Jeff; Paulison, Robert David; Johnson, Harvey E

Cc: Sweet, Chad; bennett.waters@dhs.gov; Knocke, William R

Subject: Fw: CBS Evening News on formaldehyde in FEMA trailers

Jeff: can you work with FEMA to do a quick assessment of the facts associated with this story and let me know what you think? Is this a real medical concern? If so, how serious? Remedy?

Sent from my BlackBerry Wireless Handheld

----- Original Message -----

From: Knocke, William R <William.R.Knocke@dhs.gov>

To: m.jackson@dhs.gov

Cc: Collins, Laura <Laura.Collins@dhs.gov>

Sent: Thu May 17 08:14:42 2007

Subject: FW: CBS Evening News on formaldehyde in FEMA trailers

Sir,

What you heard on WTOP this morning likely stems from this CBS investigative report last night.

Kevin Souza

From: Wells, Tod [tod.wells@dhs.gov]
Sent: Friday, May 18, 2007 10:35 AM
To: Jamieson, Gil; McQueeney, Michelle
Cc: Garratt, David; Dannels, Donna; Bailey, Leslie; Souza, Kevin
Subject: FW: Formaldahyde/trailer - Re: Shep Smith

Gil,

Know you saw some of the initial email traffic yesterday on formaldehyde, but we did want to be sure you had the latest.

Per below, Dr. Runge is taking up medical exposure issue, and we'll be coordinating with him. Will keep you in the loop.

Tod Wells
Acting Deputy Assistant Administrator
Disaster Assistance Directorate
Federal Emergency Management Agency
Department of Homeland Security
(202) 646-3936

-----Original Message-----
From: Souza, Kevin
Sent: Friday, May 18, 2007 9:17 AM
To: Garratt, David; Dannels, Donna; Wells, Tod; Bailey, Leslie
Subject: RE: Formaldahyde/trailer - Re: Shep Smith

Is Gil aware of this?

-----Original Message-----
From: Garratt, David
Sent: Friday, May 18, 2007 9:12 AM
To: Dannels, Donna; Souza, Kevin; Wells, Tod; Bailey, Leslie
Subject: Fw: Formaldahyde/trailer - Re: Shep Smith

FYI

-----Original Message-----
From: Roe, Price <Price.Roe@dhs.gov>
To: Philbin, John <john.philbin@dhs.gov>; Fogg, Nathaniel <nathaniel.fogg@dhs.gov>; Garratt, David <david.garratt@dhs.gov>; Johnson, Harvey E <harvey.e.johnson@dhs.gov>
Sent: Fri May 18 08:52:52 2007
Subject: Formaldahyde/trailer - Re: Shep Smith

Admiral, the DepSec led a lenghty discussion at our morning meeting about the trailer issue. He has tasked Jeff Runge to take the lead on addressing the medical issues regarding long term exposure to formaldahyde in travel trailers. There is not a sense that this is a code red issue but one the DepSec would like us to dig into aggressively to make sure there aren't any hidden land mines. Dr. Runge will follow up with Dave.

W. Price Roe
Counselor to the Secretary
U.S. Department of Homeland Security
w: 202-282-8260

sent via wireless handheld

----- Original Message -----
From: Roe, Price

To: Philbin, John; Fogg, Nathaniel
Sent: Thu May 17 08:59:41 2007
Subject: RE: Shep Smith

Roger that. I heard it happen on the radio and it sounded like an ambush, though I didn't realize it was an assault as well.

Pls send me your talking points so I'm armed with them if S1 asks what's going on.

Fight the good fight.

From: Philbin, John (Pat) [mailto:john.philbin@dhs.gov]
Sent: Thursday, May 17, 2007 8:52 AM
To: Roe, Price; Fogg, Nathaniel
Subject: FW: Shep Smith

Fyi.

John P. "Pat" Philbin, Ph.D.

Director,
Office of External Affairs
Federal Emergency Management Agency
Department of Homeland Security
Phone: 202-646-4600 (office)
202-306-0262 (cell)
E-mail: john.philbin@dhs.gov

From: Philbin, John (Pat)
Sent: Thursday, May 17, 2007 8:51 AM
To: 'Knocke, William R'
Cc: Keehner, Laura; Walker, Aaron; McIntyre, James; Kaplan, James
Subject: RE: Shep Smith

Russ,

If this is the reporter that physically grabbed Administrator Paulison by the belt after the Hearing on Tuesday, I have instructed Aaron that I will object to any interview with him while I am here. I will be happy to explain to his boss that he manhandled Administrator Paulison and, in my view, crossed the line. We have TPs and plenty of info on the web that we'll be happy to send over on this issue.

Mac,

Pls send Russ our info on this issue.

John P. "Pat" Philbin, Ph.D.

Director,

Office of External Affairs
Federal Emergency Management Agency
Department of Homeland Security
Phone: 202-646-4600 (office)
202-306-0262 (cell)
E-mail: john.philbin@dhs.gov

From: Knocke, William R [mailto:William.R.Knocke@dhs.gov]
Sent: Thursday, May 17, 2007 8:32 AM
To: Philbin, John; Walker, Aaron
Cc: Keehner, Laura
Subject: Shep Smith

Asking for someone to come on this afternoon on the CBS investigative story from last night. Do you have a statement that you can provide?

Russ Knocke

Press Secretary

Department of Homeland Security

Office: 202.282.8010

Cell: 202.297.2551

Fax: 202.282.8408

Garratt, David

From: Runge, Jeff [Jeff.Runge@dhs.gov]
Sent: Friday, May 18, 2007 3:47 PM
To: Isles, Adam; Schneider, Paul; Burnette, Tina; Schneider, Paul
Cc: Jamieson, Gil; Garratt, David; Waters, Bennet; Duke, Elaine C; Roe, Price
Subject: RE: FEMA/formaldehyde in trailers – FW: Reporter that accosted the Chief after the hearing Tuesday

My advice is to put a hold on the citation of standards and levels as we try to ferret out what is going on, if anything. That the trailers met manufacturing specs is fine for a legal defense, but it may not be relevant to the complaints being waged or the Congressional investigations being contemplated. There is no reason to believe FEMA did anything wrong or is culpable in any way, so let's keep our powder dry while we work through it.

Regarding "levels, this may be helpful:

- Mobile home specifications apply to trailers over 28 feet long, but not to "travel trailers."
- Spot measurements are meaningless, unless it is part of a more comprehensive measurement and evaluation. Formaldehyde does have a "ceiling limit," meaning a level that readings should never exceed, but a "spot" reading without knowing where and how this reading was done (e.g., in a previously closed trailer over a hot carpet) is meaningless.
- "Levels" should have a unit attached to them to be meaningful. Examples:
  - TWA = Time weighted average over 8 hours
  - PEL = Permissible exposure limit – OSHA's legally enforceable standard that workers can't be exposed to 0.75 ppm TWA (the 8-hr average).
  - STEL = Short-term exposure limit – OSHA standard that workers can't be exposed to > 2 ppm over 15 minutes.
  - TLV = Threshold limit level -- American Conference of Governmental Industrial Hygienists (ACGIH) guideline that 0.3 should not be exceed for any time period – quite different than OSHA standard.
  - REL = Recommended Exposure Level – NIOSH guideline of 0.016 ppm TWA and 0.1 ppm STEL. These are not industrial standards having to meet cost/benefit requirement for a regulation, but are based solely on public health considerations.
- None of these are germane to 24-hr x 7 days/week exposure in a mobile home or trailer that a child or stay-home parent may experience.
- Peak levels in mobile homes manufactured before 1980 have been reported to be in the 1-2 ppm range, with newer homes being 0.1 to 0.3 range.
- No residential indoor air quality standards have been established in the U.S. There are HUD standards for building materials, but it has always been considered too difficult to measure and regulate actual residential indoor air quality.
- A 1985 HUD regulation covering the use of pressed wood products in manufactured

housing requires peak levels below 0.4 ppm. No time-weighted levels are provided.

Hope this is helpful. We are engaged with CDC Environmental Health as CDC toxicologists to help figure out the steps to run this to ground.
Jeff

Jeffrey W. Runge, MD
Assistant Secretary for Health Affairs (Acting)
and Chief Medical Officer
U.S. Department of Homeland Security
202-254-6479
jeff.runge@dhs.gov

From: Isles, Adam
Sent: Friday, May 18, 2007 2:29 PM
To: Schneider, Paul; Burnette, Tina; 'Schneider, Paul'; 'Duke, Elaine C'; Burnette, Tina; Runge, Jeff
Cc: Jamieson, Gil; McQueeney, Michelle; Garratt, David; Buras, Ryan; Waters, Bennet
Subject: RE: FEMA/formaldehyde in trailers -- FW: Reporter that accosted the Chief after the hearing Tuesday

Looping in Jeff Runge

Adam Isles
Deputy Chief of Staff
U.S. Department of Homeland Security
202-282-8350 - tel

From: Schneider, Paul
Sent: Friday, May 18, 2007 2:26 PM
To: Burnette, Tina; Schneider, Paul; Duke, Elaine C; Burnette, Tina; Isles, Adam
Cc: Jamieson, Gil; McQueeney, Michelle; Garratt, David; Buras, Ryan
Subject: RE: FEMA/formaldehyde in trailers -- FW: Reporter that accosted the Chief after the hearing Tuesday

Thanks Tina.
Adam, this answers the question we discussed.
paul

From: Burnette, Tina [mailto:tina.burnette@dhs.gov]
Sent: Thursday, May 17, 2007 3:26 PM
To: Schneider, Paul; Duke, Elaine C; Burnette, Tina
Cc: Jamieson, Gil; McQueeney, Michelle; Garratt, David; Buras, Ryan
Subject: RE: FEMA/formaldehyde in trailers -- FW: Reporter that accosted the Chief after the hearing Tuesday

Sir please see below response from the FEMA Program office in response to your question. Please let us know if you have additional questions.

Thanks

Response: No. FEMA did not produce any specifications which changed the practices of the commercial industry. However, with the mass production during Hurricane Katrina "cheaper" materials may have been used to produce tens of thousands of units to house Disaster Victims in a timely manner. We are not aware of any industry testing of recreational housing units prior to the Katrina Formaldehyde report. There is no way then to verify that the formaldehyde content of building materials in recreational vehicles changed noticeably. We see no reason to suspect that it would because we did not mandate any changes in the practices of the commercial industry.

Since August 2006, any units purchased will be required to meet a certain emission standard and will almost

certainly eliminate any future concerns regarding formaldehyde.

Note: Once again, CBS reported 0.17ppm in the unit which is within the levels of CFR 3280.308.

From: Schneider, Paul [mailto:Paul.Schneider1@dhs.gov]
Sent: Thursday, May 17, 2007 10:20 AM
To: Duke, Elaine C; Burnette, Tina
Subject: FW: FEMA/formaldehyde in trailers -- FW: Reporter that accosted the Chief after the hearing Tuesday

The one question that came up at this mornings mtg was – is the use of formaldehyde in our trailers noticeably different than in normal commercial trailers.
paul

From: Roe, Price
Sent: Thursday, May 17, 2007 9:07 AM
To: Isles, Adam; Bergman, Cynthia; Schneider, Paul; Fox, Ed; Waters, Bennet; Runge, Jeff
Cc: 'Knocke, William R'; Philbin, John; Fogg, Nathaniel
Subject: FEMA/formaldehyde in trailers -- FW: Reporter that accosted the Chief after the hearing Tuesday

FEMA is on top of the situation. See below for more context. The reporter literally crossed the line (I heard the ambush on CSPAN radio).

The following is from the FEMA press release of May 4, 2007:

Also in July 2006, FEMA distributed information to trailer occupants across the Gulf Coast explaining how those persons sensitive to formaldehyde may be affected by its presence and spelling out specific actions that should be taken to ventilate the units. The advice, which was validated by the study, involved urging occupants to take the following steps:

- ***Increase ventilation***. Open the windows and door of the trailer and use fans to force stale air out and bring fresh air in.
- ***Keep indoor temperatures cool***. Heat does cause formaldehyde to increase the rate at which it releases fumes, so, after the trailer is well ventilated, keep temperatures cooler with air conditioning,.
- ***Keep the humidity low***. Like heat, humidity causes formaldehyde to release fumes, so keep the relative humidity in the trailer at about 40 to 50 percent.
- ***Do not smoke inside.*** Tobacco smoking releases formaldehyde and other toxic chemicals.

The brochures are being updated to recommend that occupants ventilate trailers thoroughly if they have been closed up for several days.

Based on the findings of the study, FEMA is moving forward with the following:

- Establishing procedures for ventilating units currently in inventory;
- Strengthening training for employees and contractors concerning the presence of formaldehyde and methods of reducing levels in travel trailers and park models;
- Updating and standardizing communications to occupants regarding the presence of and methods for reducing formaldehyde in temporary housing units;

- Formalizing procedures for responding to formaldehyde complaints from travel trailer occupants; and

- Working with manufacturers to reduce formaldehyde emitting materials in FEMA-purchased units.

From: Fogg, Nathaniel [mailto:nathaniel.fogg@dhs.gov]
Sent: Thursday, May 17, 2007 9:01 AM
To: Roe, Price
Subject: Re: Reporter that accosted the Chief after the hearing Tuesday

Price – The reporter you are referring to physically grabbed Administrator Paulison by the belt after the Hearing on Tuesday, Pat Philbin has instructed Aaron Walker that he will object to any interview with him while he is here. He will be happy to explain to the reporter's boss that he manhandled Administrator Paulison and, in Pat's view, crossed the line. We have TPs and plenty of info on the web that we'll be happy to send over on this issue. The link below shows the kind of public affairs efforts we are making. The article below is the kind of press we have been seeing down in NOLA. The issue has risen again as a result of wheeling in new TTs into Greensberg, KS.

http://www.fema.gov/news/newsrelease.fema?id=36010

FEMA, environmentalists spar over formaldehyde risk in trailers

5/10/2007, 5:30 p.m. CT

By CAIN BURDEAU

The Associated Press

NEW ORLEANS (AP) — The Federal Emergency Management Agency says the risk from formaldehyde fumes in new government-issued travel trailers, which has cropped up as an issue since Hurricane Katrina, can be reduced by opening vents and windows.

While acknowledging the existence of formaldehyde concentrations in its trailers, FEMA dismissed findings by environmentalists that the trailers pose serious health risks.

FEMA's recent announcement, based on tests conducted last year, comes as new trailers are being sent to the victims of the tornado that devastated Greensburg, Kan., and coastal communities brace for a new hurricane season, which starts June 1.

The formaldehyde is mostly contained in the particleboard so ubiquitous in trailers, from the wobbly walls to kitchen cabinets in the trailers' cramped quarters.

"The trailers FEMA uses adhere to the industry standards," said Aaron Walker, a FEMA spokesman. "We have no need, and we see no need, to question the reliability and safety of the trailers."

He said tests show that formaldehyde levels are noticeable in brand new trailers, as with many other new products, but that over time the levels fall.

"As long as residents can properly ventilate their units, there is no significant health hazard, little if any," Walker said. "What we're saying is that as you first move in, keep the trailers ventilated for those first three, four days."

In May 2006, the Sierra Club raised concerns about formaldehyde concentrations in FEMA trailers along the Gulf Coast. At the time, the environmental group said it found unsafe levels of formaldehyde in 30 out of 32 trailers it tested.

The group's sampling cast doubt on the safety of 118,000 trailers FEMA was stationing on the Gulf Coast to house people made homeless by hurricanes Katrina and Rita in the late summer and fall of 2005.

On Thursday, the Sierra Club issued more test results, which it said clearly showed that formaldehyde emissions are a persistent problem in the trailers, long after they are first moved into.

To prove that, the group presented Lindsay Huckabee, who has lived in a FEMA trailer with her five children in Kiln, Miss., since Katrina destroyed her home.

During a teleconference, Huckabee said her family has suffered from respiratory problems and nosebleeds. Sometimes, her children sleep in tents outside to get away from the fumes, she said. Katrina destroyed so many homes are few affordable places to rent now, and she said that leaves her family stuck in the trailer.

Fried, Jordan

From: Orsino, Stephen
Sent: Wednesday, May 23, 2007 8:31 AM
To: Fried, Jordan
Subject: FW: Lep partner, cbs, dilemna

Jordan,

I got the forwarded email on the formaldehyde issue. Passing on to you for any action you deem appropriate.

Stephen T. Orsino
Associate Chief Counsel - General Law
Federal Emergency Management Agency
Department of Homeland Security
(202) 646-3204 Office
(202) 646-3958 Facsimile
(202) 438-4187 Cellular

To: Orsino, Stephen
Subject: RE: Lep partner, cbs, dilemna

I assume any reply to this email is also privileged or somehow protected by your office from disclosure.

I was a little uncomfortable jumping into the FEMA nightmare but part of my heart will always be at FEMA. I think if you are getting your advice from those boys downstairs, you need to change advisor to Tony the industrial hygienist at DHS. I think right now FEMA is comparing apples to oranges. Tony actually is now the deputy safety director and the industrial hygienist position is open. Ask him the following:

1. In the recent EPA/Agency for Toxic Effects Registry study, they sample areas butcompare the results to ACGIH TLV Ceiling of 0.3 ppm. This is an occupational exposure limit and should not be applied to other applications and populations (like indoor air quality and residents who include the very young and very old) See ACGIH policy statement below.

Policy Statement on the Uses of TLVs® and BEIs®

..... To extend those uses of the TLVs® and BEIs® to include other applications, such as use without the judgment of an industrial hygienist, application to a different population, development of new exposure/recovery time models, or new effect endpoints, stretches the reliability and even viability of the database for the TLV® or

BEI® as evidenced by the individual *Documentation*.

Area samples for IAQ are usually compared to EPA guidelines or ASHRAE guidelines for indoor air not OSHA or ACGIH limits. (0.1 or less for the substance in question).

2. When doing indoor air quality (IAQ) , AREA samples are usually done like the study above. In the March 2006 FEMA study, personal samples were done for worker exposure and the area samples were done for resident exposure. In the FEMA memo, NO conclusion was drawn on the area results yet he talks about some of the area results and ignores the high ones in the refurbished trailers . Again, Area samples for IAQ are usually compared to EPA guidelines or ASHRAE guidelines not OSHA or ACGIH limits. (0.1 or less for the substance in question in indoor air).

But the March area study was just a survey and was supposed to be an interagency project led by Ellen Clas (DAE and no longer at FEMA). It was anticipated by some of us that there would be more data after the March work. But then....

3. I told Dick Seeds you might be calling him. He is worried about the ramifications of talking to you but I told him you could be trusted.

Well I feel I have done my duty to my loyalty to FEMA. Good luck.

Feel free to call me.

Formaldehyde Event DHS/OHA SITREP DRAFT #002

Date/Time(EDT):	**May 25, 2007/1200 hrs**
Incident Type:	**Travel Trailer Formaldehyde Event**
Interagency Partners	**DHS (OHA, FEMA); HHS (CDC [NCEH, NIOSH, ATSDR])**

Executive Summary

KEY POINTS / TALKING POINTS:

1. The first priority of DHS, including FEMA, in this issue is to ensure the safety and health of all persons living in FEMA supplied temporary portable housing.

2. A physician from the DHS Office of Health Affairs (OHA) has spoken directly to the pediatrician who has raised the current concern on the Gulf Coast. His concern is that he and his group have seen an anecdotal but clear association between living in FEMA trailers and an increase in frequency and severity of upper respiratory illness and believe that the government (state and federal) have an obligation to determine the cause and ensure mitigation.

3. Elevated formaldehyde levels are an obvious and well publicized possible cause, but there are many other factors that could impact these people. As the Sierra Club notes, the general environment of the Katrina area is affected by storm debris with high levels of contaminants and that "there has also been significant air pollution from open burning." The USG approach must address the specific formaldehyde possibility, but not ignore other contributing factors or alternate explanations.

4. OHA, on behalf of FEMA, has been working with CDC to determine the best strategy for a scientifically sound epidemiologic and toxicologic investigation to determine the complete extent of the issue and what the possible causes are, and to identify targets for engineering changes to reduce any health threats found. CDC will provide their initial recommendations by May 25th.

DETAILED TALKING POINTS/BACKGROUND INFO:

HISTORY:

1. Formaldehyde in housing is an issue that has been of concern for 30 years. After all this time and many studies, there are no agreed-upon standards for formaldehyde exposure in residential housing.

2. Last Fall, FEMA asked the Agency for Toxic Substances and Disease Registry (ATSDR) to evaluate formaldehyde levels based on complaints of odors and upper respiratory irritation. The studies, using trailers in storage, showed that adequate ventilation ensured that formaldehyde levels remained below 0.3 ppm. This was consistent with ATSDR statements that "a level of concern for formaldehyde in trailers used in temporary housing would be 0.3 ppm...."

3. Trailer residents were given instructions in the fall on increasing ventilation to decrease irritation due to possible elevated formaldehyde. Complaints to FEMA markedly decreased.

RECENT DEVELOPMENTS

4. Over the winter, physicians in the Gulf Coast region, most notably a pediatrician in Bay St. Louis, noted an anecdotal association between families in trailers and frequent and recurrent URIs. This was remarkable to the physicians because these were patients they followed both before and after Katrina,

and they did not see similar patterns in the same families before Katrina In fact, they observed that most families with trailer-associated recurrent upper respiratory complaints reverted to not having these problems once they moved out of the trailers. In speaking with the Bay St. Louis physician, he has no clinical basis for associating increased upper respiratory symptoms with elevated formaldehyde levels other than that the symptoms he has seen match symptoms associated with elevated formaldehyde.

5. The Sierra Club took measurements of formaldehyde levels in operational FEMA trailers and found levels as high as 0.34 ppm (in excess of the OSHA standard for occupational exposure) and consistently higher than 0.1 ppm. The Sierra Club notes that manufactured housing must meet formaldehyde standards and calls for the same standards to be instituted for RVs. (The mobile home standard is a manufacturing standard of no more than 0.2-0.3 ppm for materials).

CURRENT APPROACH:

6. While there is no clear link between elevated formaldehyde levels and the observed illness pattern, the possibility must be considered. At the same time, however, the possibility that the observed illness pattern is due to other exposures, other environmental conditions in the area, or just simply the very close living conditions in a trailer. There is also the possibility that the perceived pattern could not be proven with through evaluation.

7. FEMA in conjunction with OHA has requested that the National Center for Environmental Health at CDC recommend a strategy for answering the following questions:

- What are the current levels of formaldehyde (and other compounds that could cause symptoms) in actual operational trailers ("exposure study")? This is a difficult issue because of the number of confounding variables, but it has to be done to answer public concerns.

- Is there a direct correlation between living in a FEMA trailer and increases in upper respiratory complaints ("health effects study")? If so, what are probable causes (understanding that formaldehyde is only a possible cause if there is a problem)?

- What is the reasonable maximum formaldehyde level that FEMA should engineer to for both current trailers and future use?

8. The National Center for Environmental Health is coordinating the efforts of the Division of Air Pollution and Respiratory Health, the Agency for Toxic Substances Disease Registry, and the National Institute for Occupational Safety and Health to provide a strategy for answering these questions by Friday of this week.

9. The CDC effort will address short term actions ("If we assume formaldehyde is part of the problem, what level should FEMA target for engineer solutions") and, more importantly, intermediate term issues to determine if the anecdotal illness pattern reports are real, are associated with trailers, and if so, try to confirm what factor is the most likely culprit.

- Under development (FEMA) are two maps depicting data for **18** May 07: the first illustrates national locations of FEMA Travel Trailers; the second illustrates state locations of FEMA Travel Trailers. (to be developed)

News Broadcast Summary

CBS TV Report, 18 May 07:

Earlier this week, **CBS News chief investigative reporter Armen Keteyian** reported that 21 months after Hurricane Katrina, there is a public health crisis along the Gulf Coast.

Children are getting sick after prolonged exposure to fumes from the toxic chemical formaldehyde used in construction of thousands of FEMA travel trailers.

In the wake of that report, there are now calls for a congressional investigation, as well as new information that FEMA may have known about the problem more than a year ago.

Some 86,000 families still call FEMA travel trailers home. Formaldehyde fumes seeping from these trailers pose a serious health threat to some young children.

On Wednesday, the man in charge at FEMA, David Paulison, had this to say on Capitol Hill: "The formaldehyde issue was brought to our attention and we went out and investigated and used the EPA and other agencies to do testing. We've been told the formaldehyde does not present a health hazard."

. . . according to an internal FEMA document obtained by **CBS News**, FEMA knew of extremely high levels of the cancer-causing chemical more than a year ago, after its own employee safety department ran tests in March 2006. Those tests, done on 28 trailers, found at least 20 had levels of formaldehyde much higher than the EPA's recommended workplace limit of .1 parts per million. In one case, as much as 1,000 percent higher.

Today, a FEMA spokesman said the internal document presented a "worst-case scenario" and that **CBS News** was misinterpreting the data. FEMA also said the **chief medical officer** for Homeland Security has begun looking into the matter.

MSNBC TV Report, August 4, 2006

46 complaints over formaldehyde have been filed by Katrina victims

Responding to reports that formaldehyde may be sickening hurricane victims living in government-provided travel trailers along the Gulf Coast, the Federal Emergency Management Agency has reversed course and ordered air quality tests to determine if some of the units are emitting unacceptably high levels of the toxic gas. Many trailer residents have reported experiencing health problems ranging from headaches and runny noses to chronic respiratory problems and nosebleeds shortly after moving into the trailers.

Responding to the anecdotal evidence, the Sierra Club tested 44 FEMA trailers and found formaldehyde concentrations as high as 0.34 parts per million — a level nearly equal to what a professional embalmer would be exposed to on the job, according to one study of the chemical's workplace effects.

All but four of the trailers it tested registered higher than the 0.1 parts per million that the EPA considers to be an "elevated level" capable of causing watery eyes, burning in the eyes and throat, nausea, and respiratory distress in some people.

The Department of Housing and Urban Development limits the use of formaldehyde-emitting products in manufactured homes -- setting a standard of 0.2 parts per million for plywood and 0.3 parts per million for particleboard materials. But the agency does not regulate travel trailers or motor homes, probably because it was never anticipated that people would spend long periods of time living in them, said the Sierra Club's Gillette.

Sierra Club News Release "Toxic Trailers" (undated: Summer 2006)

SIERRA CLUB TESTING HAS SHOWN THAT 83 PERCENT OF FEMA TRAILERS TESTED IN MISSISSIPPI, LOUISIANA AND ALABAMA HAVE LEVELS OF FORMALDEHYDE ABOVE THE RECOMMENDED LIMIT OF 0.10 PPM.

This exposes tens of thousands of occupants to the potential for health impacts including watery eyes, burning sensations of the eyes, nose, and throat, coughing, wheezing, nausea, and skin rashes. Especially vulnerable are mothers, children and the elderly, who tend to spend more time in the trailers. Formaldehyde is a colorless, strong-smelling gas, often found in particle board, glues and adhesives in the cabinetry, bunk beds and bench seats of camper trailers. Formaldehyde is listed as a carcinogen by the U.S. government and exposure at high levels over a prolonged period of time may cause cancer. Additional adverse effects with long-term exposure to formaldehyde can include headache, depression, fatigue, and impairment of memory. (Source: www.atsdr.cdc.gov/MHMI/mmg111.html—Note: ATSDR=Agency for Toxic Substances and Disease Registry.) People with existing respiratory conditions such as asthma, bronchitis, emphysema and allergies may be at increased risk of reacting to formaldehyde in their immediate environment. This is a great concern given that people along the Gulf Coast have been exposed to formaldehyde for many months now in FEMA trailers with no end in sight. Because very little affordable housing has been rebuilt, many families have no option but to continue living in a FEMA trailer. After hearing from a number of FEMA trailer residents experiencing health problems consistent with high levels of formaldehyde exposure, the Sierra Club began testing trailers along the Gulf Coast in Mississippi in April 2006. After 94 percent of the 31 tests came in higher than the OSHA recommended limit, Sierra Club did additional testing in Alabama and Louisiana in June and July. Out of a total of 52 tests, 83 percent of the trailers were above the OSHA specified limit of 0.10 parts per million. Of the remaining trailers, 4 percent were at the limit. Only 13 percent were below the limit of 0.10. The Sierra Club found formaldehyde concentrations as high as 0.34 parts per million in one trailer—a level nearly equal to what a professional embalmer using industry-proscribed safety equipment would be exposed to on the job.

Large Numbers of People are Still Living in FEMA Trailers

An estimated 150,000 FEMA trailers were distributed in Mississippi, Louisiana, Florida, Alabama and Texas following hurricanes in 2005. This emergency housing is provided at great cost to taxpayers—an average of $65,000 for 18 months. It is completely unacceptable that the government would spend so much money on housing that doesn't have good indoor air quality. Sierra Club testing has shown that storm debris in areas flooded by Hurricane Katrina had high levels of arsenic and other heavy metals in addition to very elevated levels of bacteria such as E. coli, salmonella, staphylococcus, yeast and mold in many areas (see www.sierraclub/gulfcoast/testing). There has also been significant air pollution from open burning. The last thing Katrina survivors need in addition to all their hardships is to be exposed to toxic indoor air in their FEMA trailers. The problem is apparently not just regarding FEMA trailers. The Sierra Club tested 13 different types of the RVs used as FEMA trailers and all models had some tests showing elevated levels. Additionally, purchasers of new RVs and a representative from an RV consumer group have contacted Sierra Club regarding formaldehyde outgassing concerns. One couple who purchased an RV recently told the Sierra Club that a manufacturer's representative informed them that it could take up to two years for the formaldehyde fumes to disappear. According to the couple, the manufacturers and dealer refused to take the trailer back even though the couple can't go inside their RV without experiencing immediate problems such as burning, watery eyes. It has been known for decades that formaldehyde outgassing can be a problem, and this was addressed in the manufactured housing industry long ago. It is far past time for the same standards to be instituted within the RV industry.

What Should Be Done to an Area With Elevated Levels of Formaldehyde?

-Reduce exposure by staying out of the camper as much as possible.
-Reduce the temperature setting of the air conditioning system from 80 degrees to 74 degrees, which can help reduce formaldehyde levels because formaldehyde outgasses more with high temperatures and high humidity.
-Seal materials such as particle board with an impenetrable material such as a urethane coating.
-Increase ventilation by opening windows and using vents and fans when it is not overly humid outside.
-Air purifier systems can provide some relief if they are designed to remove chemicals such as formaldehyde. Carefully check manufacturer specifications.

What Can Health Care Providers Do?

Health care providers can provide supportive measures to those who have been exposed to elevated levels of formaldehyde. These include decontamination (flushing of the skin and eyes with water), administration of oxygen, and even intravenous

sodium bicarbonate and /or isotonic fluid depending upon the level of exposure and symptoms.
(Source: www.atsdr.cdc.gov/MHMI/mmg111.html)

Testing Kit—Cost and Ordering Information
Formaldehyde testing kits may be ordered from:
Advanced Chemical Sensors, Inc.
3201 N. Dixie Highway
Boca Raton, FL 33431-6056
Phone: (561) 338-3116
Fax (561) 338-5737
Cost: $34/kit

What Should Be Done About This Problem?
If you are experiencing symptoms of formaldehyde poisoning, see your doctor. Stay out of the trailer as much as possible, visiting public places like the library or homes of friends and relatives. Call FEMA maintenance at 1-866-877-6075 and ask them to replace your trailer. In some cases FEMA has provided older trailers without the formaldehyde outgassing to people experiencing problems. Talk to your U.S. Congressional representatives and tell them to support standards for indoor air quality in RVs so this problem will not be repeated in the future.

Strategic Communications

Travel Trailer Formaldehyde Event Interagency Analysis Group

Coordinated Media Talking Points **(DHS OPA)**

Proposed Responses to the New Orleans Times Pic for Formaldehyde Questions

How many complaints has FEMA received about potential formaldehyde emissions in travel trailers to date?

Of the 120,000 travel trailers and mobile homes in the gulf, 140 formaldehyde complaints have been received as of 5/23/2007. This is includes complaints received after FEMA aggressively distributed formaldehyde brochures to residents and the recent media coverage.

What has FEMA done to address the complaints?

One of FEMA's highest priorities is the health, safety and security of the people who are temporarily living in travel trailers while they rebuild their lives following the devastation caused by disasters. While formaldehyde has been an issue in new housing and, especially, portable facilities for years, FEMA has always required that portable housing we acquire meets industry standards for formaldehyde. Upon FEMA's learning of concerns about formaldehyde being especially noticeable in the trailers FEMA was providing, FEMA took steps, consistent with recommendations used throughout the portable housing industry, to inform occupants about proper ventilation, facilitated the exchange of trailers, provided alternate forms of housing when requested and available FEMA also went beyond the basic recommendations to take a scientific approach to trying to ensure that the trailers FEMA had acquired were meeting a standard for formaldehyde levels by having our federal partners study the dynamics of formaldehyde levels in our trailers to help ensure that recommended strategies would work to lower levels.

Recognizing that some people are more sensitive to formaldehyde irritation than others, FEMA began to address formaldehyde issues in connection with travel trailers on a case-by-case basis. The agency implemented a practice of investigating complaints about formaldehyde levels; sending a housing staff employee to visit with the occupants of the units to discuss ventilation of the unit. If the unit had an obvious formaldehyde odor or the occupants were experiencing physical discomfort while in the unit, FEMA offered to replace the unit with an older unit that had reduced levels of formaldehyde emissions. It is well-established in the portable housing industry that "off-gassing" of formaldehyde from the construction materials is more pronounced when these materials are new and that levels decrease significantly with age and ventilation.

In July 2006, FEMA initiated the development and implementation of an air monitoring and sampling plan to establish and verify methods to reduce the presence of formaldehyde fumes in travel trailers. The sampling was conducted by the Environmental Protection Agency (EPA) and the data were analyzed by the Agency for Toxic Substances and Disease Register, which is affiliated with the Centers for Disease Control, at the U.S. Department of Health and Human Services (HHS).

FEMA has further engaged in the formulation of a team to conduct scientific research to review current concerns about the relationship of formaldehyde levels seen in the trailers to the health of anyone who is or may in the future live in FEMA-travel trailers as temporary housing as they recover from disasters. The team that is forming up includes the Department of Homeland Security Office of health Affairs, and several appropriate elements of the Centers for Disease Control and Prevention (CDC). Of note, these evaluations will not be limited to formaldehyde, but will take a holistic view of analyzing symptoms and possible causes.

Has FEMA replaced the offending trailers?

FEMA has and continues to replace affected units where applicants have requested an older unit that has reduced levels of formaldehyde emissions. As of May 15, 2007, FEMA has replaced 47 units. Some of the households complaining about formaldehyde decided against FEMA's offer to swap their unit and others have identified more permanent housing solutions, resulting in unit deactivation.

Do you have any information on how many trailers might be affected?

All new housing is affected by off-gassing of formaldehyde by building materials. It is difficult to say how many of the FEMA provided trailers are "at-risk," because factors which effect the concentration of formaldehyde in indoor air include the type and age of source materials, ventilation, temperature and humidity. Also, some people are more sensitive to the effects of formaldehyde than others.

Have the complaints been centered around a particular make or model of travel trailers? If so, who was the manufacturer, and what was the make and model?

FEMA is focusing on all of the travel trailers in its inventory. Remember, there aren't any set industry standards for indoor formaldehyde levels in residential housing, and specific HUD manufacturing standards apply to "mobile homes" not to travel trailers, so each manufacturer needs to be contacted to confirm their statistics and the standard to which they build their products.

What materials in the trailers contain formaldehyde?

Formaldehyde is found in new permanent press fabrics, new carpets, latex paint, fingernail polish, antiseptics, medicines, cosmetics, dish-washing liquids, fabric softeners, shoe-care agents, carpet cleaners, glues, adhesives, lacquers and plastics. In addition formaldehyde is produced by cigarettes and other tobacco products and gas cookers.

Please be as specific as possible. Would FEMA consider requiring manufacturers to use materials without formaldehyde, or with smaller amounts of formaldehyde, in the future?

FEMA has already begun to apply standards issued by the U.S. Department of Housing and Urban Development for formaldehyde emission levels for wood products used in the construction of manufactured homes (mobile homes) to both travel trailers and park models purchased by the agency. Park models are larger than travel trailers, but smaller than manufactured homes. The HUD standard places limits on formaldehyde emissions and product certification of all plywood and particleboard materials, which involves emission certification by a nationally recognized testing laboratory and a written quality control plan for each plant where particle board is produced or finished or where the plywood is finished. These standards have been required by HUD for manufactured homes, and now FEMA's specifications have incorporated those same standards for travel trailers. The HUD standards also require that each manufactured home be provided with a Health Notice on formaldehyde emissions as required by 3280.309 of the Standards. Adjustments to this will be made based on the findings of follow-up reviews by agencies responsible for determining the effects of formaldehyde and potentially setting standards.

FEMA distributed brochures to residents of travel trailers beginning in August 2006 with tips on how to reduce formaldehyde exposure. Could you please provide a PDF version of that brochure.

Was FEMA aware of the potential for formaldehyde exposure when it ordered the travel trailers? If so, what steps, if any, did FEMA take to assess the risk to consumers or work with manufacturers to use materials that do not emit formaldehyde?

Formaldehyde in housing is an issue that has been of concern for 30 years. After all this time and many studies, there are no agreed-upon manufacturing industry standards for formaldehyde exposure in housing. However, upon learning of the concerns in 2006, FEMA proactively solicited the EPA to conduct testing of the air in a sample group of 96 new, unused travel trailers.

EPA air sampling began and lasted for two weeks. First step was to gather baseline data on two groups of the 96 new, unused units, which had been closed up for approximately six weeks.

* Only previously unoccupied trailers were tested in order to eliminate any effects from human activities that might cause formaldehyde levels to rise.

* After collecting baseline data, on group of trailers was ventilated by leaving windows and static vents open.

* For the second group, windows were left closed and manufacturer-installed air conditioning units were run continuously.

* Samples were taken at different times of the day; ambient outdoor samples also were taken concurrent with the collection of the samples in the trailers.

* Ambient temperature and relative humidity data was collected as well for each ambient sample.

FEMA forwarded the data to the Department of Health and Human Services' (HHS) Agency for Toxic Substances and Disease Register in Atlanta, Ga., which is associated with the Centers for Disease Control, also part of HHS. The Agency for Toxic Substances and Disease Registry provided to FEMA an analysis of the EPA test data from the testing in the travel trailers. Those findings were posted to our website in early 2007.

Has FEMA changed any policies with regard to acceptable formaldehyde levels in travel trailers since Gulf Coast residents started complaining about exposure?

FEMA has already begun to apply standards issued by the U.S. Department of Housing and Urban Development for formaldehyde emission levels for wood products used in the construction of manufactured homes (mobile homes) to both travel trailers and park models purchased by the agency. Park models are larger than travel trailers, but smaller than manufactured home. Adjustments to this will be made based on the findings of follow-up reviews by agencies responsible for determining the effects of formaldehyde and potentially setting standards.

Did manufacturers take any shortcuts that might have resulted in higher formaldehyde emissions in their efforts to get travel trailers to Gulf Coast residents as quickly as possible?

You would have to ask the manufacturers.

How serious of a threat to public health does FEMA consider formaldehyde exposure to be?

FEMA is not a health or science agency and has, therefore, consulted with the federal agencies and offices that do have the medical jurisdiction and science technology to properly test, evaluate and provide the proper conclusions on the effects of formaldehyde on citizens living in FEMA-provided travel trailers. Those agencies include the DHS Office of Health Affairs, EPA, CDC and all of its sub-agencies as well as with state health officials.

FEMA neither sets health standards nor has the expertise or capability to monitor health issues. Therefore, the agency will follow the recommendations of those agencies that do have the responsibilities for determining the effects of exposure to formaldehyde under specific conditions.

FEMA is committed to ensuring that any facilities provided meet high standards for protecting the occupants' health. Determination of these standards and health recommendations is done by the scientifically-based agencies with the expertise and experience in health matters. FEMA requires application of these standards and where there is question about the applicability or achievement of these standards, FEMA engages appropriate professionals to reassess and update their recommendations.

Coordinated Press Releases **(FEMA/DHS OPA)**

March 28, 2007

Statement On Travel Trailers And Formaldehyde

Our investigation of formaldehyde and travel trailers indicates that ventilating the units can significantly reduce levels of formaldehyde emissions. We continue to study the issue to determine what other specific actions can be taken to protect the public.

In the meantime, we have applied standards issued by the U.S. Department of Housing and Urban Development for formaldehyde emission levels for wood products used in the construction of manufactured homes (mobile homes) to both travel trailers and park models purchased by the agency. Park models are larger than travel trailers, but smaller than manufactured home.

The HUD standard places limits on formaldehyde emissions and product certification of all plywood and particleboard materials, which involves emission certification by a nationally recognized testing laboratory and a written quality control plan for each plant where particle board is produced or finished or where the plywood is finished. These standards have been required by HUD for manufactured homes, and now FEMA's specifications have incorporated those same standards for travel trailers.

Formaldehyde is a common substance that is found in homes and buildings everywhere. It is present in glue, particleboard, plywood as well as furniture made with these products. Formaldehyde also is found in a variety of materials encountered in everyday life - cigarettes and cigarette smoke and personal care products. Some people may be particularly sensitive to the chemical, while others may not have any noticeable reaction at all. The HUD standards also require that each manufactured home be provided with a Health Notice on formaldehyde emissions as required by 3280.309 of the Standards.

FEMA manages federal response and recovery efforts following any national incident, initiates mitigation activities and manages the National Flood Insurance Program. FEMA works closely with state and local emergency managers, law enforcement personnel, firefighters and other first responders. FEMA became part of the U.S. Department of Homeland Security on March 1, 2003.

Coordination

Travel Trailer Formaldehyde Event Interagency Analysis Group

Description:

National-level interagency coordination: DHS/OHA
POC: Dr. William Lang, Associate Chief Medical Officer
CDR Merritt Lake, USPHS

Nationwide subject-matter expert coordination: CDC National Center for Environmental Health
POC: Senior POC: Mike McGeehin, PhD, MSPH Dir., Div of Environmental Hazards and Health Effects
Lead POC: Paul Garbe, DVM, MPH, Dir., Air Pollution and Respiratory Health
Other: David Callahan, MD, Medical Officer NCEH
Alison Stock, Staf Scientist, Air Pollution and Respiratory Health
Gary Noonan, Assoc Div Dir, Air Pollution and Respiratory Health

Other CDC Agencies involved:
NIOSH: Larry Reed, Deputy Division Director
Env Hlth Haz Eval: Ken Orloff, Assoc Dir (Science)
ATSDR: Scott Deitchman, MD, MPH, Associate Director for Emergency Response

Intelligence Assessment

Not Applicable

Status of Emergency and/or Declarations

Agency	Date Requested	Type of Request	Status	Date	Remarks
		Emergency/Disaster	*Approved/Disapproved/Pending*	*Approved/Disapproved*	
HHS	*None*				
HUD	*None*				
DHS	*None*				
(Other)	*None*				

Congressional Actions
Description: **Honorable Henry A. Waxman's May 15, 2007 Request for Information** 1. Documents relating to communications between FEMA and the trailer manufacturers regarding formaldehyde levels in trailers built for FEMA; 2. Documents relating to FEMA's procedure for handling complaints from occupants regarding FEMA-issued trailers, including documents relating to the method in which the information was collected and cataloged, FEMA's organizational structure for handling complaints, and the procedure for responding to complaints; 3. Documents relating to any complaint, concern, or question by any occupant of a FEMA-issued trailers regarding pungent odors, formaldehyde, or harmful health effects associated with FEMA-issued trailers, including documents relating to FEMA's response to the complaints, concerns, or questions; 4. Documents relating to FEMA's assertion in the March 23, 2007, letter that it has received only "70 complaints out of 118,000 travel trailer units," including documents relating to FEMA's cataloging and organization of these complaints; 5. Documents relating to the Sierra Club's testing of the formaldehyde levels in FEMA-issued trailers and the results of the tests; 6. Documents relating to FEMA's plan address formaldehyde levels in FEMA-issued trailers from 2005 to the present; 7. Documents relating to any study or report commissioned by FEMA, or any other Federal agency, to determine formaldehyde levels in FEMA-issued trailers; and 8. Documents relating to any communication regarding formaldehyde levels in FEMA-issued trailers by FEMA employees or between FEMA and any other federal agency or Federal officials.

Scientific Data (Summaries)

Description:
ATSDR August 2006 ***We do not have complete data***

ATSDR Feb 2007 study sampled trailers in storage in Baton Rouge, LA. The conclusions included "Average level of Formaldehyde in air conditioned trailers was above 0.3 ppm. Average level of Formaldehyde in ventilated trailers without A/C was below 0.3 ppm."

Testing Plans

Pending
Description:

1. Special equipment **(CDC)(NIOSH)**
2. Trained staff/expertise **(CDC)(NIOSH)**
3. Agents to conduct lab testing **(CDC)(NIOSH)**
4. Confirmation authority **(CDC)(NIOSH)**

Standards:

Organization	Time Weighted Average (over 8 hrs)	Threshold Limit Value (cannot exceed)	Short Term Exposure Limit (15 minute TWA)
NIOSH (Not enforceable)	0.016 ppm		0.1 ppm
OSHA (workplace enforceable)	0.75 ppm		2.0 ppm
ACGIH (Amer Conf Gov't IH) (recommendation only)		0.3 ppm	
EPA (outdoor only)	0.1 ppm		
HUD (materials testing only) Plywood		0.2 ppm	
HUD (materials testing only) Particleboard		0.3 ppm	

*Note HUD testing is by placing a sample of the material in a specific testing box and measuring the formaldehyde level after a period of time. It is NOT a test of formaldehyde levels in living spaces.

State and Local Actions
Description: 1. State Health Departments: No action at present

Department of Health and Human Services (HHS)
Formal recommendation for study activities pending (due o/a Feb 25, 2007)

FEMA and DHS Formal Actions
See earlier FEMA press release March 28, 2006

Other Formal Federal Actions
HHS, CDC 1. Mobile Homes (not trailers) have a required HUD statement attached regarding formaldehyde levels

Garratt, David

From: Garratt, David
Sent: Wednesday, May 30, 2007 7:35 PM
To: Souza, Kevin
Subject: RE: F/U on Formaldehyde recommendations

I'll be in all morning.

-----Original Message-----
From: Souza, Kevin
Sent: Wednesday, May 30, 2007 6:39 PM
To: Garratt, David
Subject: Re: F/U on Formaldehyde recommendations

Are you in tomorrow at all?

I should probably talk to you before I jump on this call.

K

-----Original Message-----
From: Garratt, David
To: Dannels, Donna; Souza, Kevin; Misczak, Mark; Jamieson, Gil; McQueeney, Michelle; Wells, Tod; Bailey, Leslie
Sent: Wed May 30 18:13:30 2007
Subject: FW: F/U on Formaldehyde recommendations

FYI: Call-In number for meeting with CDC tomorrow in Atlanta.

-----Original Message-----
From: Lang, William L Dr [mailto:bill.lang@dhs.gov]
Sent: Wednesday, May 30, 2007 6:08 PM
To: Garratt, David
Subject: RE: F/U on Formaldehyde recommendations

Here it is:

866-795-8110, passcode 5261198. The target start time is 1000. I arrive at ATL aat 0900, but they said that on MARTA, I should be able to make it to their stop in time and I don't know Atlanta well enough to know. Also, here are the adjusted 3 key questions with your comments from last night added.

1. How should the US Government determine if there are excessive levels of formaldehyde (or other substances) contributing to noted adverse health effects on residents of FEMA-provided temporary portable housing (travel trailers), and if it is determines that some substance(s) are contributing to these effects, what are reasonable target levels for mitigation of both long-term and short-term health effects?
Specifically: at what maintainable (through mitigation) formaldehyde level can we advise occupants that they are "safe?"

2. Recognizing that the answer to number 1 may take some time, and given that formaldehyde is known to cause the symptoms that are the subject of complaints, does 0.1 ppm (or some other level) of formaldehyde represent a adequate interim goal for mitigation of all trailers (with the proviso that certain populations may be sensitive even at that level and a case-by-case determination on alternatives based on symptoms may be required).
Specifically, does CDC recommend that occupants be relocated from trailers which cannot be mitigated to the above recommended level?

3. What are practical mechanisms to determine both short and long term engineering solutions to reach the target levels identified and what continuing mitigation requirement does CDC recommend (e.g., does CDC recommend that FEMA test and monitor, on a regular and recurring basis, formaldehyde levels in every occupied trailer)?

-Bill

-----Original Message-----
From: Garratt, David [mailto:david.garratt@dhs.gov]
Sent: Wednesday, May 30, 2007 5:23 PM
To: Lang, William L Dr
Subject: RE: F/U on Formaldehyde recommendations

Bill:

Do you have a meet-me number set up for tomorrow's meeting with CDC?
The Gulf Coast recovery Office would like to participate via telecon as well.

Thanks.

Dave

-----Original Message-----
From: Lang, William L Dr [mailto:bill.lang@dhs.gov]
Sent: Tuesday, May 29, 2007 7:48 PM
To: Garratt, David
Subject: Re: F/U on Formaldehyde recommendations

I'll press on.

----- Original Message -----
From: Garratt, David <david.garratt@dhs.gov>
To: Lang, William L Dr <bill.lang@dhs.gov>
Cc: Souza, Kevin
Sent: Tue May 29 19:47:52 2007
Subject: RE: F/U on Formaldehyde recommendations

Bill:

I would like to attend in person, but believe that speed is more important than personal attendance at this meeting. Would recommend proceeding with Thursday and allowing us to participate by telecon. Am concerned that rescheduling to next week would send the wrong signal (in terms of urgency) to CDC.

Assume there will be other follow-on meetings with them; if so, will try mightily to make myself available.

Dave

-----Original Message-----
From: Lang, William L Dr [mailto:bill.lang@dhs.gov]
Sent: Tuesday, May 29, 2007 7:41 PM
To: Garratt, David
Subject: Re: F/U on Formaldehyde recommendations

Dave-

I agree with your questions and I think that they're encompassed in the simplified set, but I'll make sure they're addressed explicitly. Also, if you would want me to push them back from Thursday we could certainly do that. When they offered, I took them up to show we're serious about wanting to move as rapidly as possible, but if you would rather have someone go another day, I'm sure we could set that up, too.
-Bill

----- Original Message -----
From: Garratt, David <david.garratt@dhs.gov>
To: Lang, William L Dr <bill.lang@dhs.gov>
Cc: Dannels, Donna; Souza, Kevin; Jamieson, Gil; McQueeney, Michelle; Wells, Tod; Bailey, Leslie
Sent: Tue May 29 19:37:00 2007
Subject: RE: F/U on Formaldehyde recommendations

Bill:

Thanks. We would like to participate in your meeting, but it will have to be by phone. The few of us sufficiently familiar with the background, and senior enough to engage at the required level, have commitments on Thursday which will prevent in-person attendance. I will be speaking at a conference all afternoon, but have asked Kevin Souza - who is our program expert in this issue - to participate in your meeting by phone, if that can be arranged.

Regarding the questions below. I think they are all good questions, and necessary. But I am not sure they represent all of the questions that should be asked. Missing from this list are the following:

1. What continuing mitigation requirement does CDC recommend (e.g., does CDC recommend that FEMA test and monitor, on a regular and recurring basis, formaldehyde levels in every occupied trailer)?

2. At what maintainable (through mitigation) formaldehyde level can we advise occupants that they are "safe?"

3. Does CDC recommend that occupants be relocated from trailers which cannot be mitigated to 0.1 ppm? If not 0.1 ppm, at what level?

Dave

From: Lang, William L Dr [mailto:bill.lang@dhs.gov]
Sent: Tuesday, May 29, 2007 4:32 PM
To: Garratt, David
Subject: RE: F/U on Formaldehyde recommendations

Dave-

Here's the latest from CDC. I talked to them at length on the phone today and they would like to get together for a face to face discussion on Thursday down in Atlanta. My schedule is clear enough that I can make that work. Would you want someone from FEMA to go (I think that would be great, but I know it's awfully short notice). I'm flying down first thing in the morning and back in the evening. They read me the not-yet-cleared approach that they are going to recommend and it souds fairly complete. They are going to be fairly resistant to recommending an interim target, but I think that we need that in order to make a positive step now, while the science is "cooking." They are not going to be able to give us a guaranteed "safe" level for everyone, but they should be able to say: "30 years of scientific study shows us that 99.9% of people would not be bothered by formaldehyde below x ppm (probably
0.1) and this represents a reasonable short term mitigation goal."

I feel comfortable that if we get the answers to the below questions, that will help us to ensure the health and safety of the trailer residents (and give us something to stand on for the coming hurricane season). Do you feel comfortable that if we can get answers to the questions below, it will answer the mail from Congress and the press. I do, but I haven't been at this as long as you have! Of note, these are just shorter versions of the 2 page "issues paper" I sent them 2 weeks ago, which they have been using as their guide in coming up with a response.

I also asked Dr McGeehin if a formal Request for Assitance letter from FEMA (with a funding comittment) would be what they need to get started and he's confirming that with his hierarchy.

-Bill

From: McGeehin, Mike (CDC/CCEHIP/NCEH) [mailto:mam7@CDC.GOV]
Sent: Tuesday, May 29, 2007 3:15 PM
To: Lang, William L Dr; Garbe, Paul (CDC/CCEHIP/NCEH); Noonan, Gary (CDC/CCEHIP/NCEH)
Subject: RE: F/U on Formaldehyde recommendations

These are fair questions. What we have been trying to work up is a plan to answer the first part of #1, but before we are able to share that with FEMA we need to have it reviewed by others in the agency. The investigation of whether the trailers might be associated with children's symptoms could be fairly expensive. We would need sufficient sample size and the ability to look at the overall indoor air parameters, in addition to formaldehyde. No single study is going to show cause for an environmental agent. The second two questions can be answered by toxicologists and, perhaps, the NIOSH staff on the mitigation issue. I doubt if any epi study will permit us to define a level below which adverse effects do not occur.

I hope to have something in writing by tomorrow that has been cleared.
You can certainly send a request for assistance to CDC at any time that includes the issues that are of concern to your agency.

Mike

Michael A. McGeehin, PhD, MSPH
Director,
Division of Environmental Hazards and Health Effects National Center for Environmental Health, MS-F-52 Centers for Disease Control and Prevention Atlanta, GA 30333
(770) 488-3400; fax - (770) 488-3460

From: Lang, William L Dr [mailto:bill.lang@dhs.gov]
Sent: Tuesday, May 29, 2007 2:25 PM
To: Garbe, Paul (CDC/CCEHIP/NCEH)
Cc: McGeehin, Mike (CDC/CCEHIP/NCEH)
Subject: F/U on Formaldehyde recommendations

Paul-

I was hoping we would hear from CDC today on the recommendations for the way forward, but I haven't heard anything yet. Do you know where things stand? As you can imagine, FEMA and the leadership is getting fairly antsy for what we should do.

In the absence of other guidance from CDC, the questions we are going to put in a Request for Assistance are:

1. How should the US Government determine if there are excessive levels of formaldehyde (or other substances) contributing to noted adverse health effects on residents of FEMA-provided temporary portable housing (travel trailers), and if it is determines that some substance(s) are contributing to these effects, what are reasonable target levels for mitigation of both long-term and short-term health effects?

2. Recognizing that the answer to number 1 may take some time, and given that formaldehyde is known to cause the symptoms that are the subject of complaints, does 0.1 ppm (or some other level) of formaldehyde represent a adequate interim goal for mitigation of all trailers (with the proviso that certain populations may be sensitive even at that level and a case-by-case determination on alternatives based on symptoms may be required).

3. What are practical mechanisms to determine both short and long term engineering solutions to reach the target levels identified?

I've been holding off on putting together the formal RFA because I wanted you all to tell us the best questions to ask, but at this point, FEMA and the Chief Medical Officer (Jeff Runge) want us to move forward as soon as possible.

-Bill

William L. Lang, MD, MHA
Associate Chief Medical Officer
U.S. Department of Homeland Security
202-254-6785

Martinet, Mary

From: Igert, Jill
Sent: Thursday, May 31, 2007 7:56 PM
To: Stark, James W
Cc: Martinet, Mary
Subject: Formaldehyde call summary
Attachments: Formaldehyde Call Summary.doc

Jim,

Here is a summary of the call. I put in bold the "plan of action" as discussed at the end of the call.

Thanks,

Jill F. Igert, Senior Counsel
Office of Chief Counsel
Louisiana Transitional Recovery Office
(504) 762-2205 (NO desk)
(504) 570-7300 (cell)
(504) 762-2882 (fax)

Formaldehyde Call Summary
05/31/07

Participants

Dr. William Lang, DHS
Mike McGeehin, NCH
Ken Orloff
Gary Noonan
Paul Gar
Allison, NOISH
Ken Wallingford, NOISH
Jordan Fried, FEMA
Kevin Souza, FEMA
Jim Stark, FEMA
Jill Igert, FEMA

Below is a summary of the two hour plus conversation. The parties didn't identify themselves prior to speaking:

Dr. Lange stated that the purpose of seeking CDC involvement is attributed to reports from pediatricians in Mississippi regarding children with increased upper respiratory issues post-Katrina. Evidently, particular pediatrician has treated several families for years prior to the disaster and has noticed a marked increase in respiratory issues in these families. One of the participants in the call stated that when he contacted the Dr. that he isn't taking a position that the increase is due to formaldehyde, however.

There are three issues that DHS/FEMA is asking CDC to resolve:

1. How to determine if excessive levels of formaldehyde or other substances are in the units. Establish reasonable target levels for exposure to formaldehyde, both long and short term.

2. What can be done immediately to mitigate the levels in the units

3. Are there mechanisms to reach target levels for the short and long terms.

Question as to whether CDC is comfortable with setting levels for children living in trailers. NOISH levels focus on adults in occupational environment. There was a debate about the practicality of coming up with a level. Kevin Souza stated that it won't work to just establish levels, we have to know what we will do. Souza stated that we worked with CDC last year to mitigate levels and decision was made to ventilate, but now that isn't sufficient. The problem with ventilating is the competing instructions of opening the windows and turning on the air conditioner. It doesn't work in Louisiana or Mississippi during the summer time.

Kevin asked if there was anything like a filtration unit that would work in removing the formaldehyde for the unit. Ken stated that it is difficult to remove formaldehyde because it doesn't absorb very well. Charcoal based filtration units would absorb water instead of the formaldehyde and the formaldehyde would be re-released into the atmosphere.

It was discussed that CDC would do a study that looks at the environment that the families are living in. The study would incorporate pediatrician input and use control groups of other children.

Kevin stated that the problem will be what to do as an alternative to using travel trailers for the applicants. Are we going to say we can't use trailers? Will ultimate safety solution be relocating people? CDC stated that there may be different exposure levels established for different time periods.

Kevin stated that he has worked the recreational vehicle industry to change the specifications and materials that will be used in future trailers (based upon what HUD established for mobile homes).

CDC stated that heat exchanging ventilation system might work. This would be an air conditioning system that purifies the air and doesn't ventilate out. This would be very expensive. Another solution would be to seal the particle board in the units with a paint, but that might be impractical (would have to tear out and rebuild the units) and would cause exposure to the paint components, as well.

Someone stated that they weren't hearing an acceptable engineering/mitigation solution being offered/available. Conversation appeared that the group was ready to accept that there was not mitigation solution available.

Kevin stated that we might have to stop the national sales program of the units to applicants to use as a temporary housing solution.

Allison asked about bringing in HUD to establish levels.

It was discussed that the families could stay in the units because of the "benefit analysis" of not having the unit and having to move, possibly out of state for housing. Statement was made (not by FEMA representative) that the US government couldn't allow the applicants to assume the risk of staying in the units.

Discussion occurred regarding the lack of data on long term exposure. NOISH will extrapolate from the data that they have accumulated on occupational health as a start.

Dr. Lang stated that the study should answer the simple question, based upon a reasonable sample, whether living in the trailers is associated with health effects of the occupants, especially children.

CDC asked who will pay for this and stated that the study would cost in the low millions at a minimum. Kevin stated that the DRF could be used.

Timeline was discussed. The problem will be the biologic testing because the labs have queues. They will also have to get the testing criteria pre-approved and an OMB exemption in order to do the study within the next few months. Field work in the units can be done in 2-3 months. The air quality testing in the lab would take 4-6 months – if there are no roadblocks. We won't have answers for this hurricane season.

Kevin stated that FEMA would be hesitant to redeploy refurbished units to another disaster until the study is completed. FEMA may have to come up with other housing options for future disasters other than travel trailers. ALSO, HE STATED THAT WE MAY HAVE TO TAKE IMMEDIATE STEPS TO GET PEOPLE OUT OF THESE UNITS.

Strategy for proceeding was finally discussed:

1. **NOISH will review the data and information that they have currently available and make recommendations as to maximum exposure levels (talked with Kevin after the call and he believes that these levels will be very low and conservative).**

2. **CDC will do a quick assessment of current field conditions in a sampling of units. (discussed hiring an independent contractor to do this because they don't have the manpower to get this done quickly).**

3. **Random sampling could turn into need to test every single unit or to remove the units all together. Jordan brought up the litigation problems with doing the testing of the individual units and that this would be discoverable. Kevin, Jordan and a member of the CDC will meet tomorrow to discuss the concerns. (After the call, Kevin told me that he will press to have the CDC and DHS search for other mitigation solutions).**

4. **Question arose if we decide to replace the units as to whether or not the study of the effects of long term exposure would be necessary. It was discussed that the long term health effects of the persons that get moved may have to be monitored.**

Conclusion of the call.

Garratt, David

From: Garratt, David
Sent: Friday, June 01, 2007 9:53 PM
To: 'gil.jamieson@dhs.gov'; McQueeney, Michelle
Subject: Fw: Formaldehyde

FYI

-----Original Message-----
From: Johnson, Harvey E
To: Garratt, David; Philbin, John (Pat) <john.philbin@dhs.gov>; Trissell, David
CC: Souza, Kevin; Wells, Tod; Bourne, Marko; Paulison, Robert David; Heighberger, Eric B
Sent: Fri Jun 01 21:17:39 2007
Subject: RE: Formaldehyde

Dave - As we discussed, I agree with the direction of your proposal, but recommend you slow roll any sales and/or provisions as opposed to a notice to suspend. Further, we need to have a discussion with the Chief, Public Affairs, Leg Affairs, and Legal to consider our public position. Once we have a position, then would support more visible suspension as we will then be in position to address the likely inquiries.

Further with the larger issues, appreciate your willingness to frame the four major issue of interest, and then to set up a meeting with the OHA folks. This course will permit me and the Chief a chance to come up to speed on the issues.

From: Garratt, David
Sent: Friday, June 01, 2007 1:36 PM
To: Paulison, Robert David; Johnson, Harvey E; Bourne, Marko
Cc: Souza, Kevin; Wells, Tod
Subject: Formaldehyde
Importance: High

Gentlemen:

Dr. Lang met with CDC, NIOSH and others yesterday in Atlanta to discuss the formaldehyde issue strategy; Kevin Souza participated in the discussion. Based on the outcomes of that meeting, I need to discuss with you the merits of taking two interim actions while that multi-month CDC-led analysis process is ongoing:

1. Suspend the provision of ANY travel trailers for any disasters, effective immediately.

2. Suspend the sales of travel trailers to occupants, effective immediately.

Would like to meet for 30 minutes - anytime this evening (except 2:30-4:30 when I will be meeting with appropriations staff) to discuss.

Dave

Kevin Souza

From: Wells, Tod [tod.wells@dhs.gov]
Sent: Monday, June 04, 2007 9:05 AM
To: Garratt, David; Souza, Kevin; Shulman, Dan
Cc: Bailey, Leslie; Smith, Heather R; Philbin, John
Subject: Formaldehyde - CDC clip

Formaldehyde coverage – references letter from CDC Director to Cong. Taylor in response to his request for an investigation.

Dan – Do you have any contacts with CDC or HHS congressional that could provide a copy of the CDC Director's letter? If no, we could check through DHS Health Office.

Formaldehyde High In Trailers (Jackson Clarion Ledger)

By Ana Radelat
Jackson Clarion Ledger, June 4, 2007

WASHINGTON — There's little the federal government can do about the possibility that elevated levels of formaldehyde in hurricane trailers are making people sick, according to the Centers for Disease Control and Prevention.

About 24,400 Federal Emergency Management Agency mobile homes and trailers are in Mississippi, housing about 65,900 Hurricane Katrina victims.

Rep. Gene Taylor, D-4th District, in February asked the CDC for a "detailed investigation" into whether formaldehyde in trailers is causing an outbreak of respiratory illnesses.

CDC Director Julie Louis Gerberding wrote Taylor last week that her agency "recognizes that residents experiencing symptoms want and need to alleviate their discomfort."

But Gerberding said the effects of formaldehyde "are likely to be transient."

She sent the congressman information about formaldehyde, and said the CDC inspected closed FEMA trailers and found their levels of formaldehyde "to cause irritation to eyes, nose and/or throat."

Gerberding and FEMA have suggested the effects can be avoided by airing out the trailer or mobile home.

Gerberding also said she contacted FEMA, the Environmental Protection Agency, the Department of Housing and Urban Development and the Department of Transportation with Taylor's request for an investigation.

But none of the agencies said they are responsible for monitoring formaldehyde levels in trailers.

"Everybody says, 'It's not me,' " said Brian Martin, Taylor's policy director. "What Taylor had expected is that someone would investigate."

Formaldehyde is a colorless gas with a pungent, irritating odor that is present in small amounts in the air and in some food.

It is used in the production of fertilizer, plywood and resins.

Some studies of people exposed to formaldehyde in workplace air found more cases of cancer than expected, but other studies did not confirm this finding, a CDC report said.

Low levels of formaldehyde can cause irritation of the eyes, nose, throat and skin.

The lack of federal response to a problem identified by some environmental groups and doctors on the Gulf Coast - that FEMA trailer residents may be suffering from respiratory problems linked to formaldehyde - has annoyed several lawmakers besides Taylor.

"The apparent lack of oversight and federal government response to the known exposure of thousands of Gulf Coast residents to a dangerous carcinogen is unacceptable," said Rep. Bobby Jindal, R-La.

Last month, Jindal asked Rep. Bennie Thompson, D-2nd District, the head of the House Homeland

Security Committee, and other House leaders for congressional hearings into the formaldehyde issue.

Thompson's press secretary, Dena Graziano, said Thompson is considering Jindal's request.

"He's passionate about the issue," she said.

Also last month, Rep. Henry Waxman, D-Calif., the head of the House Oversight and Government Reform Committee, repeated his request to FEMA Director David Paulison for information about how much FEMA knows about the formaldehyde levels in trailers.

Paulison missed a deadline last week that Waxman set for the turnover of information.

But Waxman's press secretary, Karen Lightfoot, said FEMA officials have agreed to provide the information - which includes records of all complaints from trailer residents about formaldehyde - and is working on a schedule to submit it to the committee.

But a frustrated Martin said its time for Mississippi health officials to determine just how toxic FEMA's trailers are, especially because the CDC has offered to help them.

"I think the state Department of Health has to step up here," he said.

Liz Charlotte, spokeswoman for the Mississippi Department of Health, said the agency is not authorized to regulate indoor air quality.

"(The Legislature) would have to change our mandate and give us the funds to do it," she said.

Charlotte also said the state is not responsible for the trailers.

"Those trailers were given to us by the feds," she said.

Meanwhile, Katrina victims have to deal with any formaldehyde problem on their own.

In her letter to Taylor, Gerberding said trailer residents should "avoid certain products and activities likely to increase formaldehyde levels."

That includes avoiding dry cleaning fluids, some household cleaners, paints, varnishes and cigarettes.

Kevin Souza

From: Lang, William L Dr [bill.lang@dhs.gov]
Sent: Monday, June 04, 2007 2:06 PM
To: Souza, Kevin
Subject: FW: DHS Questions

Kevin-

Here are the 4 questions, annotated with the goal for each (we're going to rewrite 2-4 so they are do not have Yes/No responses!)

1. Determine the levels of certain air quality measures (including formaldehyde, VOCs, molds, airborne bacteria) for a representative sample of these trailers, under actual use conditions, in order to assist FEMA in making short-term risk management decisions concerning continued habitation of these trailers.

The goal of this question is to determine the actual conditions in the field. All parties recognize that there are a number of confounding issues involved (smoking, cooking, other items stored in the trailers, etc.), but CDC believes that they can get a statistically valid sample that will tell us the levels of certain components known to affect indoor air quality (to include formaldehyde, but also looking at substances that CDC believes are more likely culprits including molds, mildews, airborne bacteria, etc.). The prior thought process was that FEMA needs to ensure that the trailers can have low enough formaldehyde levels, but the current question is much more broad: Are these trailers, when used for prolonged periods under real-life conditions, providing a safe and healthful environment for residents? Given the current Congressional and public concern, the broad question has to be addressed.

2. Can ATSDR develop a protective indoor air level for formaldehyde for various time-of-residence periods that will help guide FEMA in risk management decisions concerning continued habitation of these trailers?

This is the flip-side of question 1. Once actual current conditions are established, these are only relevant in terms of what is the best available research on the health impacts of these substances, specifically formaldehyde. The goal is for ATSDR to be able to provide a levels addressing:
a: Best estimate for no detectable long term health effects for stays shorter than 30 days, 90 days, 180 days, one year (these exact times are subject to discussion, but it makes the question more clear)
b: Best estimate for no irritant effects in 90% of subjects for stays of similar durations

3. Can CDC/ATSDR identify any practical mechanisms or engineering solutions for these trailers to reach target levels that would ensure safety/health of residents?

Based on the results from questions 1 and 2, is there any practical means of getting the observed levels down to the acceptable? The initial thought at CDC was that it will be very difficult to achieve reduction in temperature, reduction in humidity, and adequate numbers of air exchanges to bring about adequate dilution of formaldehyde (and other possible contributors to poor qualtiy indoor air) in the gulf coast in the summer. Rather than an off-the-cuff answer, even though these are some of the true "world's experts," we have asked them to reach out to their collegues in organiations such as HUB, NIST, and possibly academia to determine if there is any type of filter, air exchanger, or other engineering approach that might be able to achieve the requisite conditions.

4. Can CDC help FEMA to determine whether there is an association between poor indoor air quality in FEMA trailers and adverse health effects in children who live in these trailers?

This is really the fundamental question of the whole investigation. Unfortunately, this will take at least a year (or more) to answer, because it requires a thorough indoor environmental assessment (similar to the effort for question 1), but collected over time and with coupled with corresponding interviews and observations of the residents of the corresponding trailers in order to determine, in a statistically valid manner what are the associations between conditions and health effects.

-Bill Lang

William L. Lang, MD, MHA
Associate Chief Medical Officer
U.S. Department of Homeland Security
202-254-6785

From: McGeehin, Mike (CDC/CCEHIP/NCEH) [mailto:mam7@CDC.GOV]
Sent: Friday, June 01, 2007 9:25 AM
To: Lang, William L Dr
Cc: Noonan, Gary (CDC/CCEHIP/NCEH); Garbe, Paul (CDC/CCEHIP/NCEH)
Subject: FW: DHS Questions

Bill,

Here are the 4 questions based on our meeting yesterday and our conversations. Please edit and revise at your discretion.

Thanks,
Mike

Michael A. McGeehin, PhD, MSPH
Director,
Division of Environmental Hazards and Health Effects
National Center for Environmental Health, MS-F-52
Centers for Disease Control and Prevention
Atlanta, GA 30333
(770) 488-3400; fax - (770) 488-3460

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1. Can CDC help FEMA to determine whether there is an association between poor indoor air quality in FEMA trailers and adverse health effects in children who live in these trailers?

2. Can CDC quickly evaluate the levels of certain air quality measures for a representative sample of these trailers to assist FEMA in making short-term risk management decisions concerning continued habitation of these trailers?

3. Can ATSDR develop a protective indoor air level for formaldehyde for various time-of-residence periods that will help guide FEMA in risk management decisions concerning continued habitation of these trailers?

4. Can CDC/ATSDR identify any practical mechanisms or engineering solutions for these trailers to reach target levels that would ensure safety/health of residents?

Kevin Souza

From: Lang, William L Dr [bill.lang@dhs.gov]
Sent: Tuesday, June 05, 2007 9:24 AM
To: Garratt, David; Souza, Kevin
Cc: Krohmer, Jon
Subject: FW: formadlehyde article
Attachments: Formaldehyde in FEMA trailers article.doc

Dave, Kevin-

I can not imagine who at CDC put this referenced letter together for Dr Gerberding without consulting any of us. Have you seen a copy of it? I'm having one faxed to me if you don't have one.

Here are some thoughts for a response:

In response to a series of concerns regarding formaldehyde in 2006, FEMA asked CDC and the Agency for Toxic Substances and Disease Registry to investigate formaldehyde levels in travel trailers used as federally provided emergency portable housing after disasters. Formaldehyde is a substance that is ubiquitous in today's environment, and is even, in small levels, a normal by-product of biological processes in the human body. At higher levels, especially indoors, formaldehyde can be irritating to the respiratory system and chronic exposure to high levels may have some suspected, but unproven, long term health effects. The subject is complicated by the fact that despite 30 or more years of study, no agency has ever been able to determine a safe or unsafe level in residential indoor air.

Because formaldehyde is present in so many components that are part of the trailers as well as items that residents may bring into the trailers, last summer, ATSDR used trailers in storage to attempt to determine levels that the trailers, themselves, are responsible for as opposed to formaldehyde that may be coming from other sources. The results of the study showed that adequate ventilation could reduce the formaldehyde levels that seemed reasonable based on the best available published studies and standards (again, these were not studies or standards regarding residential air quality as the data does not exist). Information on the results and guidance for ventilation was provided to the residents of the trailers.

Subsequent anecdotal experience, especially from physicians caring for residents of trailers, has raised further questions about the formaldehyde levels that continue to be seen and questions the practicality of the ventilation advice, especially in the gulf coast region in the summer. Based on this, FEMA asked the DHS Office of the Chief Medical Officer to assist them in working with CDC to determine the best scientifically valid approach to ask to get to the root of the problem as rapidly as possible, with the primary goal being the health and safety of those who are still in travel trailers as temporary housing.

Last week, DHS and CDC met in Atlanta with representives of the National Center for Environmental Health, the Agency for Toxic Substances and Disease Registry, and the National Institute for Occupational Safety and Health. DHS fully agrees with Members of Congress and requests from the public that there must be a thorough investigation in the relationship between indoor air quality in the trailers and any health effects. An investigation of this type, however, takes time and DHS cannot wait for the results of this to take action. Consequently, and in addition to work towards a complete answer, the group determined an approach that will give us a rapid answer as to any effective way to reduce observed formaldehyde and any other significant indoor air quality problems to acceptable and non-irritating levels. This work will be intiated rapidly using multiple Federal partners working in parallel to provide decision makers and the trailers residents with a good plan, as soon as possible.

-Bill
William L. Lang, MD, MHA
Associate Chief Medical Officer

U.S. Department of Homeland Security
202-254-6785

From: Krohmer, Jon [mailto:Jon.Krohmer@dhs.gov]
Sent: Tuesday, June 05, 2007 8:07 AM
To: Lang, William L Dr
Cc: Runge, Jeff; Lenkart, Steve
Subject: FW: formadlehydearticle

FYI

Jon R. Krohmer, MD, FACEP
Deputy Assistant Secretary and
Deputy Chief Medical Officer
Office of Health Affairs
Department of Homeland Security
202 254-5762 phone
202 254-6094 fax
jon.krohmer@dhs.gov

From: Cohen, Nancy [mailto:Nancy.Cohen@dhs.gov]
Sent: Tuesday, June 05, 2007 7:40 AM
To: Krohmer, Jon
Subject: formadlehydearticle

here tiz . .

Nancy Cohen
U.S. Department of Homeland Security
Office of Health Affairs
202.254.6448

Office of Health Affairs
U.S. Department of Homeland Security
Washington, DC 20005

Homeland Security

Information Paper

Formaldehyde in FEMA Provided Temporary-use Travel-Trailers

BACKGROUND:

Formaldehyde in housing has been of concern for 30 or more years. After all this time and many studies, there are no agreed-upon standards for formaldehyde exposure in housing, and there are widely varying "standards" for formaldehyde levels in occupational settings. The Department of Housing and Urban Development does provide formaldehyde-related manufacturing standards applied to materials used in construction of mobile homes designed as long-term residences. These standards have never applied to mobile temporary-use housing such as travel-trailers since the anticipated exposures with travel-trailers are generally of such short duration.

Last fall, FEMA asked the Agency for Toxic Substances and Disease Registry (ATSDR) to evaluate formaldehyde levels in travel-trailers based on complaints of odors and upper respiratory irritation. ATSDR used a scientifically valid approach to answer the questions of whether travel trailers did intrinsically have high levels of formaldehyde, and if ventilation could reduce those levels. Those studies demonstrated that trailers in storage conditions did show baseline elevated formaldehyde levels, but also showed that adequate ventilation could ensure that that those levels remained below 0.1 ppm, the EPA outdoor air quality standard (there is no residential indoor air quality standard). These studies were repeated in March and showed the same results. Based on the studies, trailer residents were given instructions on increasing ventilation to decrease irritation due to possible elevated formaldehyde. Complaints to FEMA initially decreased.

In the ensuing months, however, additional complaints have arisen which question whether those recommendations are adequate for ensuring the health, safety, and comfort of those living in commercially-procured travel-trailers as intermediate to long-term temporary housing.

Over last winter and spring, physicians in the Gulf Coast region noted an association between families living in trailers and frequent and recurrent upper respiratory infections. This was remarkable to the physicians because these were patients that they followed both before and after Katrina, and they did not see similar patterns in the same families before Katrina. In fact, they observed that families having difficulties with respiratory issues while living in trailers, cleared of their symptoms once they moved out of the trailers.

After one physician was unable to get adequate assistance through several governmental channels, primarily at the state level, he contacted The Sierra Club which had previously published on the formaldehyde issue. The Sierra Club took measurements of formaldehyde levels in operational FEMA trailers and found levels as high as 0.34 ppm, which is in excess of the OSHA standard for occupational exposure, and consistently higher than the 0.1 ppm EPA outdoor standard. The Sierra Club study prompted an article in *The Nation* in February, entitled "Toxic Trailers."

RECENT OHA ACTIONS:

In response to these concerns, FEMA requested that the DHS Office of Health Affairs (OHA) assist in characterizing the problem and developing a scientifically and clinically valid solution strategy.

An OHA Associate Chief Medical Officer spoke to the physician who had been most quoted in the press. This physician was a very reasonable clinician who noted the pattern described above, which could be consistent with formaldehyde exposure. Importantly, and correctly, he also noted that there no clinical basis for definitively associating increased upper respiratory symptoms specifically with elevated formaldehyde levels. It is very possible that the observed illness pattern is due to multiple factors including other exposures, other environmental conditions in the area, or just simply the very close living conditions in a trailer.

In specific consideration of the formaldehyde component of the problem, OHA requested a thorough evaluation of the formaldehyde literature by the Bio-defense Knowledge Center at Lawrence Livermore Labs. The review confirmed that formaldehyde has clearly been shown be a respiratory irritant and that there are probable, but unproven, long-term health effects with high-level prolonged exposures. It also confirmed that no study data is readily available on residential exposures.

STRATEGY:

OHA, in conjunction with FEMA, has been working with the National Center for Environmental Health (NCEH) at CDC to develop a strategy for ensuring that people living in FEMA-provided temporary housing, specifically travel-trailers, are provided a safe and healthy environment. In addition to NCEH, other agencies participating in the solution development include the Agency for Toxic Substances and Disease Registry (ATSDR), The National Institute for Standards and Technology (NIST), and the National Institute for Occupational Safety and Health (NIOSH).

The investigation, which FEMA has approved, will take a two-phased approach. The first phase is an initial rapid study addressing 3 issues so that initial action can be taken in the next 90 to 120 days:

- Determine actual indoor air quality conditions in the units.
- Determine a scientifically valid target for air quality improvement through review of existing scientific literature and consultation with experts in the field.
- Assess engineering solutions that can achieve a reduction from observed to needed levels.

At the same time, in recognition of requests from the public and Members of Congress for a thorough investigation of the relationship between indoor air quality in the trailers and any health effects, CDC will undertake a more in-depth study to give us a better understanding of the complete issue. CDC estimates that an investigation of that type, however, will take at least a year.

Formaldehyde
Frequently Asked Questions
7/15/2007

How many complaints has FEMA received about potential formaldehyde emissions in travel trailers to date?

206 complaints involving odors or upper respiratory irritation that could be related to formaldehyde have been received as of 7/13/2007.

What has FEMA done to address the complaints?

One of FEMA's highest priorities is the health, safety and security of the people who are temporarily living in travel trailers while they rebuild their lives following the devastation caused by disasters. While formaldehyde has been an issue in new housing and, especially, portable facilities for years, FEMA has always required that portable housing we acquire meets industry standards for formaldehyde. Upon FEMA's learning of concerns about formaldehyde being especially noticeable in the trailers FEMA was providing, FEMA took steps, consistent with recommendations used throughout the portable housing industry, to inform occupants about proper ventilation, facilitated the exchange of
trailers, provided alternate forms of housing when requested and available FEMA also went beyond the basic recommendations to take a scientific approach to trying to ensure that the trailers FEMA had acquired were meeting a standard for formaldehyde levels by having our federal partners study the dynamics of formaldehyde levels in our trailers to help ensure that recommended strategies would work to lower levels. Recognizing that some people are more sensitive to formaldehyde irritation than others, FEMA began to address formaldehyde issues in connection with travel trailers on a case-by-case basis. The agency implemented a practice of investigating complaints about formaldehyde levels; sending a housing staff employee to visit with the occupants of the units to discuss
ventilation of the unit. If the unit had an obvious formaldehyde odor or the occupants were experiencing physical discomfort while in the unit, FEMA offered to replace the unit with an older unit that had reduced levels of formaldehyde emissions. It is well-established in the portable housing industry that "off-gassing" of formaldehyde from the construction materials is more pronounced when these materials are new and that levels decrease significantly with age and ventilation.

In July 2006, FEMA initiated the development and implementation of an air monitoring and sampling plan to establish and verify methods to reduce the

presence of formaldehyde fumes in travel trailers. The sampling was conducted by the Environmental Protection Agency (EPA) and the data were analyzed by the Agency for Toxic Substances and Disease Register, which is affiliated with the Centers for Disease Control, at the U.S. Department of Health and Human Services (HHS).

FEMA has further engaged in the formulation of a team to conduct scientific research to review current concerns about the relationship of formaldehyde levels seen in the trailers to the health of anyone who is or may in the future live in FEMA-travel trailers as temporary housing as they recover from disasters. The team that is forming up includes the Department of Homeland Security Office of health Affairs, and several appropriate elements of the Centers for Disease Control and Prevention (CDC). Of note, these evaluations will not be limited to formaldehyde, but will take a holistic view of analyzing symptoms and possible causes.

Has FEMA replaced the offending trailers?

FEMA has and continues to replace affected units where applicants have requested an older unit that has reduced levels of formaldehyde emissions. As of July 13, 2007, FEMA has replaced 58 units. Some of the households complaining about formaldehyde decided against FEMA's offer to swap their unit and others have identified more permanent housing solutions, resulting in unit deactivation.

Do you have any information on how many trailers might be affected?

All new housing is affected by off-gassing of formaldehyde by building materials. It is difficult to say how many of the FEMA provided trailers are "at-risk," because factors which effect the concentration of formaldehyde in indoor air include the type and age of source materials, ventilation, temperature and humidity. Also, some people are more sensitive to the effects of formaldehyde than others.

Have the complaints been centered around a particular make or model of travel trailers? If so, who was the manufacturer, and what was the make and model?

FEMA is focusing on all of the travel trailers in its inventory. Remember, there aren't any set standards for indoor formaldehyde levels in residential housing, and specific HUD manufacturing standards apply to "mobile homes" not to travel trailers, so each

manufacturer needs to be contacted to confirm their statistics and the standard to which they build their products.

What materials in the trailers contain formaldehyde?

Formaldehyde is in many building products. Two of the most common are plywood and particleboard. These are the only two materials for which HUD has established a standard for use in mobile homes. Carpets are also a common source of formaldehyde in housing. It is also found in new permanent press fabrics, latex paint, fingernail polish, antiseptics, medicines, cosmetics, dish-washing liquids, fabric softeners, shoe-care agents, carpet cleaners, glues, adhesives, lacquers and plastics. In addition formaldehyde is produced by cigarettes and other tobacco products and gas cookers.

Would FEMA consider requiring manufacturers to use materials without formaldehyde, or with smaller amounts of formaldehyde, in the future?

FEMA has already begun to apply standards issued by the U.S. Department of Housing and Urban Development for formaldehyde emission levels for wood products used in the construction of manufactured homes (mobile homes) to both travel trailers and park models purchased by the agency. Park models are larger than travel trailers, but smaller than manufactured homes. The HUD standard places limits on formaldehyde emissions and product certification of all plywood and particleboard materials, which involves emission certification by a nationally recognized testing laboratory and a written quality control plan for each plant where particle board is produced or finished or where the plywood is finished. These standards have been required by HUD for manufactured homes, and now FEMA's specifications have incorporated those same standards for travel trailers. The HUD standards also require that each manufactured home be provided with a Health Notice on formaldehyde emissions as required by 3280.309 of the Standards. Adjustments to this will be made based on the findings of follow-up reviews by agencies responsible for determining the effects of formaldehyde and potentially setting standards.

Was FEMA aware of the potential for formaldehyde exposure when it ordered the travel trailers? If so, what steps, if any, did FEMA take to assess the risk to consumers or work with manufacturers to use materials that do not emit formaldehyde?

Formaldehyde in housing is an issue that has been of concern for 30 years. After all this time and many studies, there are no agreed-upon manufacturing industry standards for formaldehyde exposure in housing. However, upon learning of the concerns in 2006, FEMA proactively solicited the EPA to conduct testing of the air in a sample group of 96 new, unused travel trailers.

- EPA air sampling began and lasted for two weeks. First step was to gather baseline data on two groups of the 96 new, unused units, which had been closed up for approximately six weeks.
- Only previously unoccupied trailers were tested in order to eliminate any effects from human activities that might cause formaldehyde levels to rise.
- After collecting baseline data, on group of trailers was ventilated by leaving windows and static vents open.
- For the second group, windows were left closed and manufacturer-installed air conditioning units were run continuously.
- Samples were taken at different times of the day; ambient outdoor samples also were taken concurrent with the collection of the samples in the trailers.
- Ambient temperature and relative humidity data was collected as well for each ambient sample.

FEMA forwarded the data to the Department of Health and Human Services' (HHS) Agency for Toxic Substances and Disease Register in Atlanta, Ga., which is associated with the Centers for Disease Control, also part of HHS. The Agency for Toxic Substances and Disease Registry provided to FEMA an analysis of the EPA test data from the testing in the travel trailers. Those findings were posted to our website in early 2007.

Has FEMA changed any policies with regard to acceptable formaldehyde levels in travel trailers since Gulf Coast residents started complaining about exposure?

FEMA has already begun to apply standards issued by the U.S. Department of Housing and Urban Development for formaldehyde emission levels for wood products used in the construction of manufactured homes (mobile homes) to both travel trailers and park models purchased by the agency. Park models are larger than travel trailers, but smaller than manufactured home. Adjustments to this will be made based on the findings of follow-up reviews by agencies responsible for determining the effects of formaldehyde and potentially setting standards.

Did manufacturers take any shortcuts that might have resulted in higher formaldehyde emissions in their efforts to get travel trailers to Gulf Coast residents as quickly as possible?

You would have to ask the manufacturers.

How serious of a threat to public health does FEMA consider formaldehyde exposure to be?

FEMA is not a health or science agency and has, therefore, consulted with the federal agencies and offices that do have the medical jurisdiction and science technology to properly test, evaluate and provide the proper conclusions on the effects of formaldehyde on citizens living in FEMA-provided travel trailers. Those agencies include the DHS Office of Health Affairs, EPA, CDC and all of its sub-agencies as well as with state health officials.

FEMA is committed to ensuring that any facilities provided meet high standards for protecting the occupants' health. Determination of these standards and health recommendations is done by the scientifically-based agencies with the expertise and experience in health matters. FEMA requires application of these standards and where there is question about the applicability or achievement of these standards, FEMA engages appropriate professionals to reassess and update their recommendations.

Kevin Souza

From: McNeese, Martin
Sent: Tuesday, July 17, 2007 12:15 PM
To: Souza, Kevin
Subject: RE: FEMA Trailers--Formaldehyde

Kevin, nothing so far in my, Steve Miller's or Gail Haubrich's archives regarding any contact with other agencies. I found a note from the IA call on 5/23 where Baton Rouge talked about formaldehyde and in my notes says "work with regulatory agencies re acceptable levels; not an immediate hazard" but I didn't write down who was talking. Haven't heard from Tracy yet.

Martin McNeese
martin.mcneese@dhs.gov
Emergency Management Program Specialist
FEMA Region VIII
(303)235-4897
fax (303)235-4939
cell (303)941-6498
pager 1-800-759-8888 pin 1634815
--Leaders don't attain greatness by giving orders,
but by serving others

From: Miller, Stephen [mailto:stephen.miller1@dhs.gov]
Sent: Tuesday, July 17, 2007 10:05 AM
To: McNeese, Martin
Subject: RE: FEMA Trailers--Formaldehyde

I have scoured my archived emails and can not find anything.

From: McNeese, Martin [mailto:martin.mcneese@dhs.gov]
Sent: Tuesday, July 17, 2007 11:10 AM
To: Miller, Stephen
Subject: RE: FEMA Trailers--Formaldehyde

Steve, do you have anything in your email archives indicating contact with EPA or any other federal agency regarding formaldehyde in travel trailers prior to early July 2006?

I know Tracy Haynes had a call with EPA the first week of July 2006 to begin the testing plan but it seems to me that there was earlier contact with EPA or NIOSH in April or May to talk about the formaldehyde in the trailers.

Martin McNeese
martin.mcneese@dhs.gov
Emergency Management Program Specialist
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but by serving others

From: Miller, Stephen [mailto:stephen.miller1@dhs.gov]
Sent: Tuesday, July 17, 2007 7:38 AM
To: Chawaga, David J
Cc: McNeese, Martin
Subject: FW: FEMA Trailers--Formaldehyde

FYI

From: david.robbins@gsa.gov [mailto:david.robbins@gsa.gov]
Sent: Tuesday, July 17, 2007 9:37 AM
To: roman.marciniak@gsa.gov; william.kemp@gsa.gov; lynne.price@gsa.gov; nancy.brotherton@gsa.gov; cheryl.hall@gsa.gov; jessie.hodges@gsa.gov; donald.clark@gsa.gov; mark.brantley@gsa.gov; gregory.flores@gsa.gov; taronda.reed@gsa.gov; joe.hvorecky@gsa.gov; rick.parker@gsa.gov; genni.brown@gsa.gov; nina.gonzales@gsa.gov; catherine.morant@gsa.gov; stephen.olds@gsa.gov; doug.janka@gsa.gov; jaime.hernandez@gsa.gov; bob.kitsock@gsa.gov; christopher.willett@gsa.gov; paula.hardiman@gsa.gov
Cc: sharon.chen@gsa.gov
Subject: Fw: FEMA Trailers--Formaldehyde

Evidently there may still be more of a formaldehyde issue in some of these trailers than we had thought. Please ensure that you at least mention this in your opening statements at any continuing on-site screening events. I'm not actually aware of comments from any other recipients, but you can see this is from just this past weekend..... and Steve indicated he isn't aware of the lawsuit mentioned below.....

I know I'm dropping the language on GSAXcess that says flyers will be available at each event.....but you can still refer participants to GSAXcess to print flyers themselves.....

Dave

---- Forwarded by David M. Robbins/FBP/CO/GSA/GOV on 07/17/2007 09:32 AM ----

"Miller, Stephen" <stephen.miller1@dhs.gov>

07/17/2007 09:28 AM

To david.robbins@gsa.gov
cc
Subject FW: FEMA Trailers

-----Original Message-----
From: Chawaga, David J [mailto:david.chawaga@dhs.gov]
Sent: Monday, July 16, 2007 12:36 PM
To: Miller, Stephen
Subject: FW: FEMA Trailers
Importance: High

-----Original Message-----
From: Woodey, James W SAJ [mailto:James.W.Woodey@saj02.usace.army.mil]
Sent: Monday, July 16, 2007 6:37 AM
To: Brown, Bronson
Cc: Chawaga, David; Woodey, James W SAJ; Pouliot, Andrea H HQ02

Subject: FW: FEMA Trailers
Importance: High

Bronson: What can you tell me about the below. Sounds like something other people in FEMA didn't want FEMA safety to know about. The first email below is from Rich Wright our new USACE Chief of SOH.

Jim

-----Original Message-----
From: Wright, Richard L HQ02
Sent: Saturday, July 14, 2007 02:31 PM Eastern Standard Time
To: Morgan, Madeline SWF; Pouliot, Andrea H HQ02
Subject: Re: FEMA Trailers

Thanks for the info Madeline... Andrea let's get together and approach FEMA on this, as well as get info out to the field..thanks Rich

----- Original Message -----
From: Morgan, Madeline SWF
To: Wright, Richard L HQ02; Pouliot, Andrea H HQ02
Sent: Sat Jul 14 10:44:34 2007
Subject: FEMA Trailers

I don't know if any other District got any of the FEMA trailers that they were giving away, but we did. I have monitored in 8 so far and the six I have the results back on the Formaldehyde levels are above the allowable levels. We will monitor the others and then determine what we can do to bake out these trailers. FEMA knew they had a problem with the trailers and now are offering them to the Federal Government to include Bureau of Indian Affairs without disclosing the problem. I had one of our folks stay in one for one night and got sick. The trailer he stayed in had been aired out for 10 days prior to him staying in it. When Amy and I just went in to put the monitor in the trailer we felt our eyes burning within a minute of going in. We only stayed in anyone of them for no more than 1 minute. I do believe that there is information about an on-going lawsuit against the manufacturer on these, but what I don't understand is why FEMA is offering them up without telling folks.

Kevin Souza

From: Garratt, David
Sent: Sunday, July 22, 2007 11:19 AM
To: Souza, Kevin
Subject: RE: Issues Paper

Attachments: Formaldehyde Testing Paper.doc

Formaldehyde Testing Paper.do...

Kevin: Please take a look at this and then call to discuss. Thanks.

Dave

-----Original Message-----
From: Souza, Kevin
Sent: Sunday, July 22, 2007 10:38 AM
To: Garratt, David
Subject: Re: Issues Paper

Wasn't planning on coming in until early afternoon.

Will look at the paper here and call you shortly.

-----Original Message-----
From: Garratt, David
To: Souza, Kevin
Sent: Sun Jul 22 10:39:01 2007
Subject: RE: Issues Paper

Let me know when you are in the office. Want to chat about this paper.

-----Original Message-----
From: Souza, Kevin
Sent: Sunday, July 22, 2007 12:41 AM
To: Garratt, David
Subject: Re: Issues Paper

I'm sure it is fine....let's keep moving forward.

K

-----Original Message-----
From: Garratt, David
To: Souza, Kevin
Sent: Sat Jul 21 21:53:43 2007
Subject: Fw: Issues Paper

Kevin: Please review. Most changes are cosmetic, none are profoundly substantive, although I did edit. Let me know if OK.

Dave

-----Original Message-----
From: david.garratt@verizon.net <david.garratt@verizon.net>

To: Garratt, David <david.garratt@dhs.gov>
Sent: Sat Jul 21 21:51:38 2007
Subject: Issues Paper

<<Formaldehyde Testing Paper.doc>>

FEMA DISASTER ASSISTANCE DIRECTORATE

Individual Assistance Division

Discussion, Issues and Questions Paper

FORMALDEHYDE TESTING

Overview

Formaldehyde testing of FEMA temporary housing units may be necessary to ensure the safety of current and future occupants. Any strategy development for formaldehyde testing of temporary housing units must consider and address a number of variables, and will have significant victim, financial, and political ramifications.

FEMA Temporary Housing

FEMA provides and maintains in inventory two categories of temporary housing:

1. **Manufactured Home** (eg. mobile home): A structure, transportable in one or more sections, built on a permanent chassis and designed for use with or without a permanent foundation when attached to the required utilities. Construction is regulated by HUD. The term manufactured home does not include a "recreational vehicle."

2. **Recreational Vehicle** (eg. travel trailer or park model) A vehicle built on a single chassis; 400 square feet or less when measured at the largest horizontal projection; designed to be self-propelled or permanently towable by a light duty truck; and designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

The government regulatory requirements for building materials used in construction of FEMA's temporary housing units vary by unit type; indoor air quality is not regulated for *any* unit type. Primary public domain concerns have focused on the health and safety effects of indoor formaldehyde level ***exposure***, versus secondary concerns regarding the ***causes*** of formaldehyde emissions.

Concerns have been raised that units in FEMA's inventory may be constructed of formaldehyde-emitting materials that emit greater amounts of formaldehyde than other similar, commercially available units. These concerns remain, at this point, unsubstantiated.

Testing Parameters

Any decision regarding the scope and extent of formaldehyde testing should, in order of priority, consider occupant health and safety, timeliness, the legal ability of occupants to voluntarily assume informed risk, and Agency obligations following unit transfer of title. The following is a list of

categories of unit occupation, provision, or disposition, for which a testing regimen must be developed, if implemented.

- Occupied Units: Applicants that are occupying units and are not requesting any additional action from FEMA, such as Swap-Out, Sales, Donations, etc. Includes applicants who may have previously requested action from FEMA (completed sales, donations, swap-outs). **Testing options are: test all units; test a random sampling of units; or test units only upon occupant request.**

- Swap-Outs: Applicants that are requesting FEMA exchange their occupied unit for a different unit. **Testing options are: test occupied unit prior to agreement of swap out, and/or test replacement unit prior to installation.**

- Sales: Applicants that are requesting, or have been approved, to purchase their FEMA unit. **Testing option is: test occupied unit prior to sale.**

- Donations: Applicants that are part of a request, or have been approved, for donation of their unit. **Testing option is: test occupied unit prior to donation.**

- New Occupancy: Applicants that have been approved for occupancy, but are not yet occupying any unit. **Testing option is: test unit prior to occupation.**

- Sold or Excessed Units: Applicants that have purchased units from FEMA or through GSA, and may or may not occupy units. **Testing option is: test unit upon request.**

- Units in Inventory: Includes units being held for future deployment (new or refurbished), and units awaiting excessing. **Testing options are: test all units identified for potential future use; test units only prior to designation for actual deployment; or test all units, regardless of intended use (occupation or excess).**

Baseline Safety Level

There is considerable variation among the multiple standards promulgated to establish an appropriate baseline safety level for indoor air formaldehyde levels. Because of this regulatory inconsistency, FEMA has tasked CDC to establish a safe indoor air level for formaldehyde for various time-of-residence periods, to help inform and improve FEMA's risk management decisions regarding immediate and future habitation of travel trailers.

DHS OHA has recommended .1 ppm as an interim formaldehyde baseline safety level. This recommended level is less than the OSHA standard (which is an 8-hour exposure standard), and is considered a reasonable standard by other organizations.

DHS OHA has also recommended that units be tested under the following conditions to ensure "normal" living conditions: windows and doors closed, and operating A/C units to obtain a temperature of approximately 75 degrees and normal humidity.

Individual Sensitivity

It is well documented that some individuals may be more sensitive to the effects of formaldehyde than others. Children and the elderly are particularly sensitive. Additionally, there is evidence that some people can develop increased sensitivity to formaldehyde over time.

Decisions regarding testing may need to include a determination of an individual's sensitivity to the effects of formaldehyde. Additional clarification is needed on the availability and reliability of medical tests to determine formaldehyde sensitivity. Additional clarification is also needed on the relationship between sensitivity and the potential for adverse health effects.

Implementation Options

Any decision to engage in testing will require rapid but reliable, consistently conducted formaldehyde testing and results.

FEMA has an IAA with CDC that may be adaptable to provide rapid, reliable testing without compromise to the long term CDC study (DHS OHA to confirm). FEMA may also be able to use the IA TAC to rapidly compete and award task orders to obtain services of commercial professionals (DHS OHA to provide list of credible testing companies).

A combination of testing service providers may be necessary to bridge short and long term objectives.

Other Considerations

Staging Areas:

Can Staging Areas immediately implement actions/procedures to permanently reduce formaldehyde in units (bake-off etc.?)

Can Staging Areas arrange for the identification of older and/or used units in excellent condition to be ready for testing and utilization?

Mitigating Technologies:

Can CDC and the DHS OHA accelerate efforts to research and identify any practical air purification/formaldehyde-reduction mechanisms or engineering solutions for these housing units to reach target levels that would ensure safety/health of residents?

HUD IAA:

Does FEMA need to alert HUD or modify the about-to-be-signed IAA to include the possibility that testing of units will result in an increase in applicants transitioned to HUD for apartments?

CLC:

Should FEMA authorize CLC to provide hotel/motel accommodations to applicants while formaldehyde testing is being completed on current and/or future units?

FEMA:

Should FEMA accelerate research into alternate housing options such as permanent housing construction of multi-family units and/or procurement of alternate housing units?

Key Questions

- **If we implement testing, what testing standard do we use?**
- **If we test against that standard, what action do we take for units at or above that standard?**
- **Do we test all units (travel; trailers, park models, mobile homes)?**
- **What categories of units (in terms of occupation or disposition status) do we test?**
- **What medical assistance do we offer/authorize for occupants who we determine, through testing, were exposed to levels above the testing standard threshold?**

Kevin Souza

From: McQueeney, Michelle
Sent: Tuesday, July 24, 2007 6:22 PM
To: Wells, Tod; Fields, Kathy; Souza, Kevin; Misczak, Mark; Philbin, John (Pat); McDonald, Blair
Cc: Jamieson, Gil; Castillo, Carlos; Garratt, David; Shea, Bob; Bourne, Marko; Johnson, Harvey E; Heighberger, Eric B; Trissell, David
Subject: Draft TPs for call centers--request for unit testing
Attachments: REQUESTS FOR FORMALDEHYDE TESTING_draft 072407 1800 hours.doc

All,
We (GCRO and DAD reps) had a call today with the TRO call centers, NPSCs, Region VI, FL LTRO, and CDC call center to discuss connectivity and programmatic issues that the call centers were encountering. All of the call centers are getting requests for individual unit testing---they asked for some additional bullets for their operators to use in response. We hope that by providing these consistent responses, we can prevent callers from being transferred back and forth between FEMA and CDC etc.

The attached draft bullets have been taken from existing TPs and call center script. The text in red is all that I've changed. Please review and provide your comments or changes to me and Blair McDonald so that this can be distributed to all of the FEMA call centers (NPSCs, TROs, FL, Regions/JFOs) as well as CDC as soon as possible.

Please advise if there are others I should send this draft to for review. Text is pasted below for those on blackberry.

Thanks,
Michelle

REQUESTS FOR FORMALDEHYDE TESTING OF INDIVIDUAL UNITS TALKING POINTS

- At this time, FEMA is not able to test each individual unit.
- However, FEMA has partnered with the Center for Disease Control (CDC) to conduct a field study to test air quality conditions of a representative sampling of units.
- To better understand the air quality issues that have emerged, a team of experts (industrial hygienists, epidemiologists, medical toxicologists and environmental health scientists) has deployed to three locations (New Orleans, Baton Rouge and Biloxi) this week to gather information to draft a study protocol and sampling plan.
- No large scale testing can occur until the study protocol and sampling plan has been completed.
- CDC, the Agency for Toxic Substances and Disease Registry (ATSDR), and FEMA will work together to identify practical means of reducing indoor air levels of formaldehyde to acceptable levels.
- If you have concerns about formaldehyde or have experienced symptoms associated with exposure

to elevated levels of formaldehyde in your unit, we can work with you on other on other housing alternatives.

- We are focused on moving occupants into apartments as well as reviewing additional temporary housing alternatives.

- FEMA continues to explore additional interim and longer term actions in response to the complaints arising out of the formaldehyde issue and will announce them as soon as consultations are completed with our Federal and State partners.

NOTE TO FEMA CALL CENTER OPERATORS:

- If callers have health or medical concerns and questions, they should be referred or transferred to the CDC Hotline.
- Callers should not be transferred to the CDC Hotline solely because someone is requesting that their unit be tested.
- CDC operators will also be using the above talking points in response to any requests that they receive for individual unit testing.

Kevin Souza

From: Garratt, David [david.garratt@dhs.gov]

Sent: Wednesday, July 25, 2007 7:49 AM

To: Lang, William L Dr; Runge, Jeff; Krohmer, Jon; Souza, Kevin

Cc: Lake, Merritt; Paulison, Robert David; Johnson, Harvey E; Bourne, Marko; Fogg, Nathaniel; Dannels, Donna; Wells, Tod; Castillo, Carlos

Subject: Re: CDC scoping visit to Gulf Coast

Bill: Thanks. Excellent summary and discussion.

My recommendation would be to give CDC whatever latitude they think they need, and we will initiate whatever adjustments are necessary to the IAA.

Dave

-----Original Message-----
From: Lang, William L Dr <bill.lang@dhs.gov>
To: Runge, Jeff; Krohmer, Jon; Garratt, David <david.garratt@dhs.gov>; Souza, Kevin <kevin.souza@dhs.gov>
CC: Lake, Merritt
Sent: Wed Jul 25 00:16:06 2007
Subject: CDC scoping visit to Gulf Coast

All-

Meetings today on the next steps and plans for the trailer assessment went very well.

Represented were:

FEMA Louisiana TRO

FEMA Disaster Assistance Office (including IAA COTR)

OHA

CDC National Center for Environmental Health

CDC Labs including 2 physician toxicologists

NIOSH (including an industrial hygienist and a environmental engineer)

We started with about a 90 minute meeting at the FEMA offices to review where we are, the importance of this effort, and the urgency of this effort. I explained that the number one concern is the health and safety of the people in the trailers and that our task is to develop a strategy for a rapid assessment focusing on formaldehyde level, including recommendation of an action level, and determination of possible engineering mitigations that could get the trailers from observed levels to below action levels for formaldehyde.

SUMMARY (just the key points – all are expanded in the sections that follow):

1. The more that CDC reviews the science of formaldehyde, the less they believe the evidence for long term health effects is sound. It is a respiratory irritant, but that's probably all. This would be a difficult sell in the court of public opinion, however.

2. There are some IAA issues that FEMA and CDC are working through this week. There may be issues that senior officials will be asked to decide, primarily addressing how prescriptive the IAA should be versus giving CDC latitude (with close oversight) to carry out a scientific study

3. The trailers parks are very well done, but the trailers are not conducive to long term stays, even if remediated for formaldehyde (and/or other indoor air quality issues). Park models are not just larger, but have much better infrastructure for intermediate to long term use.

4. CDC may propose using trailers awaiting distribution in OK for a remediation test. They would need guidance this week as to whether or not this is worth pursuing.

DISCUSSION:

I. SCIENCE: The NIOSH rep made an important point about the existing "NIOSH standard" of 0.016 ppm. This is NOT scientifically based, but was established in the 80s based on other organizations' findings that formaldehyde is a possible carcinogen. Because of that classification, NIOSH set the acceptable level at lowest possible measurable level above zero. The 0.016 ppm level was the lowest measurable level at the time the standard was made. There was no other science taken into consideration and the level has never been revisited.

The toxicologists were especially concerned about the attention being given to formaldehyde in this situation because, while there is no question that formaldehyde is a respiratory irritant and can cause short term health effects in sensitive individuals, the data regarding long term health effects (i.e., cancer) is being increasingly questioned by the toxicology community. The problem is that once a substance is listed by any reputable organization as possible or probable carcinogen, it is exceedingly rare that it is ever removed from the list (the classic problem of how do you prove a negative). I won't go into the science in any depth here, but in terms of systemic effects, several very thorough studies have shown that the normal blood level of formaldehyde in humans is 2.5 ppm and no inhalation exposure to formaldehyde has ever been shown to affect this level, even using modern super-sensitive assays. The possibility of a chronic purely irritant effect of formaldehyde causing cellular changes simply due to the irritation has been postulated to "set the stage" for nose and throat cancers, but this has never been shown.

The summary point was that it is clear that formaldehyde is an irritant and can contribute to the incidence of acute respiratory diseases similar to what Dr. Needle, et al, have seen. Formaldehyde, however, is just one component of the irritants and conditions that will lead to respiratory irritations and infections in trailer residents. Reduction of formaldehyde will reduce its' contribution to respiratory irritation/infection, but it is not likely to eliminate the problem

II. PROCESS: CDC is especially concerned that the proposed supplemental instructions for the IAA are too prescriptive and directive. As they described the supplement, it was written similar to contract specifications that would be given to a non-governmental contractor. They are instead providing a counter-recommendation that provides too little structure (in my opinion). We have had several long discussions on this over the course of the day and they are working to come to an effective middle ground. My recommendation was that CDC does not need to be given direction on the scientific process, but the additional instructions should include a requirement for a timetable and a list of deliverables. One small but important point was in regard to "ownership" of the data. The supplemental instructions specified that the data would be under the control of the FEMA OGC. CDC feels that this is public health data, and as such, they are the appropriate custodians. Because if held by CDC, it has some FOIA protections as public health work process, and CDC would work

closely with FEMA on any release of data or assessments as that would be in everyone's best interest.

One important component missing from the CDC version is anything regarding assistance in determination of which of the various available formaldehyde levels should be used for a target for the trailers. CDC again brought up their argument that they are not a standards setting organization, which I countered with our need for a scientific review of the various published levels. If CDC is not the organization to do that, then who is? They are again reviewing that. A consideration that was brought up in discussion was that a good approach may be for CDC to develop (very soon) an external review panel, bringing in SMEs from both government and academia to come to a consensus. If this can be done quickly, this idea would have significant merit.

III. SITE VISIT: We visited one of the largest trailer parks, a private home with a FEMA trailer in the driveway, and a small "industrial site" (a small trailer park sponsored and partially supported by a company for its' workers and others). We went into trailers at all the sites, and the technical representatives took a number of environmental samples to characterize the environment. A couple of points stood out:

- The trailer resident population is NOT homogenous. The private sites are fixing their homes and using the trailers as an adjunct. Consequently, they typically spend much less time in the trailer. The industrial/group sites residents often have jobs with the sponsoring organization and are required to pay something towards their trailer use (such as utilities). This gives them both the means and the incentive to back to a more permanent situation. The residents of the large parks are often unemployed (often single mothers) and have nowhere else to go until permanent public housing is built. Since there is no large quantity public housing coming on line in the near future, these residents would prefer to stay where they are.

- The sites, themselves are very well laid-out, with obvious care and effort into the design and establishment of the parks.

- The trailers are simply not built for long term use. Every trailer showed significant signs of heavy wear and tear (although the rehab of old trailers did seem to be fairly effective).

- The "park-model" trailers are much more conducive to intermediate term stays. While the travel trailers have a "camping out" feel, the "park models" felt much more like a small mobile home that could support a small family for a extended period.

- A major problem with indoor air quality is the HVAC system. There is NO ventilation in the units (the very small bathroom fan doesn't do much). The A/C simply chills re-circulated air, and the homes are built fairly tightly so as to be waterproof. With windows and doors closed, there is little or no air exchange, and even with windows open, there is very little air exchange since the A/C is not bringing in air, just moving it. In addition, most of the units have gas stoves and the "range hood" for the stove just filters and re-circulates the air. Gas cooking is a potent source of formaldehyde (Note that the "park model" units have much larger A/C units that may provide some ventilation depending on set-up, and are typically all electric)

IV. Other notes:

- We had no encounters with Press. The TRO did have a small press conference where they stayed to the talking points and had no tough questions asked by the press. Of note, the issue partially fell out of the news today because of a major local court case (nurse acquitted for possibly euthanizing patients during the storm when they were losing ability to provide life support).

- We noted the news reports today regarding trailers being held in OK until CDC guidance. The environmental engineer suggested that this might be an opportunity to try one of the most frequently proposed mitigation strategies, a "bake-off," with intense monitoring of levels before, during, and after. They did not want to commit to how fast this could be done, but with the right pressure, this could probably be done beginning in 7 to 10 days. (The process involves using the trailer heating system or space heaters to bring the temperature to over 95 degrees for a couple of hours, while simultaneously ventilating and (very importantly) dehumidifying. They would go through several cycles of heating/ventilating then cooling over a few days. Industry experience has been that this is effective. This would NOT, however, obviate the need for an "in-use" study, as we still now have an obligation to find out what happens under real-life use. The advantages of this bake-out

test would be: Could be done very soon to demonstrate positive action, would have results immediately available, would give us good data for use in the remainder of the study.

I'll be home mid-afternoon Wednesday and will be available to answer any questions. The group will visit a staging facility tomorrow to view storage and preparation conditions.

-Bill

William L. Lang, MD, MHA
Associate Chief Medical Officer
U.S. Department of Homeland Security
202-254-6785

Garratt, David

From: Philbin, John (Pat)
Sent: Thursday, July 26, 2007 2:46 PM
To: Paulison, Robert David; 'Johnson, Harvey E'; Trissell, David; Garratt, David; Castillo, Carlos; Bourne, Marko; Shea, Bob
Cc: McIntyre, James; Kaplan, James; Walker, Aaron; Walker, Mary-Margaret; Fox, Ed; Knocke, William R
Subject: FW: CDC Health Advisory on Potential Health Problems Related to Formaldehyde
Importance: High

Fyi.
v/r
Pat

John P. "Pat" Philbin, Ph.D.
Director,
Office of External Affairs
Federal Emergency Management Agency
Department of Homeland Security
Phone: 202-646-4600 (office)
202-306-0262 (cell)
E-mail: john.philbin@dhs.gov

From: Wolfson, Marc (HHS/ASPA) [mailto:Marc.Wolfson@HHS.GOV]
Sent: Thursday, July 26, 2007 2:17 PM
To: undisclosed-recipients
Subject: CDC Health Advisory on Potential Health Problems Related to Formaldehyde

This is an official

CDC Health Advisory

Distributed via Health Alert Network

July 26, 2007, 13:10 EDT (01:10 PM EDT)

CDCHAN-00265-07-07-26-ADV-N

Potential Health Problems Related to Formaldehyde

Among People Living in Mobile Homes or Travel Trailers

In the aftermath of Hurricane Katrina, the Federal Emergency Management Agency (FEMA) provided either mobile homes or travel trailers to Gulf Coast victims who had lost their homes in the hurricane. Currently, nearly 65,000 households occupy units in Alabama, Louisiana, Mississippi, and Texas. Most (97%) of the units are located in Louisiana and Mississippi. Concerns have surfaced recently about air quality in the trailers and the occurrence of respiratory and other symptoms resulting from exposure to formaldehyde or other respiratory

irritants among residents of the mobile homes. CDC is working with FEMA to investigate the health concerns of those living in the trailers and mobile homes.

Persons who live in mobile homes and travel trailers and are concerned about formaldehyde exposure have been directed to seek medical treatment. If these persons present with respiratory symptoms, formaldehyde exposure should be considered as a contributing factor. CDC provides in this document current knowledge about formaldehyde for clinicians that may assist them in addressing patients' symptoms and concerns.

Formaldehyde is a volatile organic compound that is released as a gas from adhesives (urea-formaldehyde resins) that are used to make products such as particle board, plywood, and hardwood paneling. These materials are used extensively in mobile homes and travel trailers, but formaldehyde can be found in almost all buildings and homes. Formaldehyde is also released from urea-formaldehyde foams in wall insulation. Older homes and mobile homes may contain this form of insulation although it is used less frequently today. Formaldehyde is also used in fertilizers and some household items such as carpets, permanent-press fabrics, and household cleaners.

Patients who have been exposed to formaldehyde may present a variety of symptoms. Formaldehyde can irritate the skin, eyes, nose, throat, sinuses, and lungs, resulting in itching, watery eyes, and cough. Some people may develop skin rashes. Others may experience difficulty in breathing with wheezing and bronchoconstriction. At-risk populations with underlying asthma, pulmonary disease, or other comorbidities may be more severely affected. These signs and symptoms may also be caused by other air-borne irritants or allergens including mold, tobacco smoke, pets, mites, cockroaches, and urban smog. People can smell formaldehyde when it is at very low levels, but they can also manifest symptoms even when they cannot smell the chemical.

Diagnosis of formaldehyde reaction is based on clinical grounds including a history of exposure, symptoms consistent with formaldehyde, a temporal association of exposure with symptoms, and the exclusion of alternative explanations for the symptoms. Some people react to formaldehyde at very low levels of exposure. Among sensitive individuals, formaldehyde antibodies (IgG and/or IgE) may form, but no antibody test has been validated for routine diagnostic use. Diagnostic challenge in an exposure chamber is a theoretical approach to confirming the diagnosis, but is not recommended for routine clinical use.

There is no specific antidote or treatment for environmental exposure. Exposure to formaldehyde should be treated symptomatically. Asthma associated with formaldehyde exposure should be treated with the usual approach to asthma with consideration given to avoiding specific exposures and allergens and using beta agonist bronchodilators and steroids, depending on the judgment of the health care provider and the patient's comorbidities. Symptoms should lessen if the affected individual is removed from the area of exposure. Patients should be encouraged to open windows and use fans to bring fresh air indoors as ways to reduce exposure to formaldehyde.

Clinicians can access additional information about indoor air pollution and formaldehyde at

http://www.epa.gov/iaq/formalde.html.

For emergent information about acute exposures health care providers should contact their local poison control center. Call 1-800-222-1222 to locate the nearest poison control center. More information about the American Association of Poison Control Centers is available at www.aapcc.org.

Categories of Health Alert messages:

Health Alert conveys the highest level of importance; warrants immediate action or attention.

Health Advisory provides important information for a specific incident or situation; may not require immediate action.

Health Update provides updated information regarding an incident or situation; unlikely to require immediate action.

##This Message was distributed to State and Local Health Officers, Epidemiologists, State Laboratory Directors, PHEP Coordinators, HAN Coordinators and Public Information Officers as well as Public Health Associations and Clinician organizations##

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You have received this message based upon information contained within our emergency notification database.

If you have a different or additional e-mail or fax address that you would like to be used, please contact the

Health Alert Network program at your State Health Department.

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FEMA INTERIM DIRECTION on use of Temporary Housing Units

Effective Date: **July 31, 2007** *(Effective until replaced or rescinded)*

Background

FEMA routinely purchases several types of temporary housing units for use in disasters: *manufactured housing* (also known as mobile homes), and *recreational vehicles* (travel trailers and larger park models).

FEMA continues to address concerns regarding the possible adverse health effects associated with temporary housing units provided to eligible disaster assistance applicants. These concerns appear to apply principally (if not exclusively) to recreational vehicles. The Centers for Disease Control and Prevention (CDC) has issued a Public Health Advisory regarding potential health problems related to formaldehyde among people living in temporary housing units. FEMA takes these concerns seriously. Accordingly, FEMA and the Department of Homeland Security (DHS) Office of Health Affairs (OHA) initiated outreach to, and are consulting with the CDC National Institute for Occupational Health (NIOSH) and the CDC National Center for Environmental Health (NCEH), to determine an appropriate methodology for conducting research on temporary housing indoor air quality and any potential associated health effects. That effort is underway.

FEMA will await the final results and recommendations of the research described above before implementing any *permanent* changes to policy. However, FEMA is implementing certain precautionary, interim measures deemed necessary to facilitate public health and safety, based on the following interim determinations:

- *Manufactured housing* construction is regulated by the Department of Housing and Urban Development (HUD), since this form of housing is designed for long-term habitation. Millions of Americans live in manufactured housing across the nation. HUD regulations include provisions which limit the amount of formaldehyde used in construction materials. Accordingly, FEMA will continue to utilize and offer manufactured housing that meets or exceeds HUD standards, as a temporary housing option.

- *Recreational vehicles* are NOT regulated by HUD, since this form of accommodation is designed for short-term recreational habitation, not housing. Accordingly, FEMA will NOT continue to offer recreational vehicles as a temporary housing option in future disasters.

Direction

Effective immediately, and until this Interim Direction is replaced or rescinded:

- No recreational vehicle (travel trailer or park model) currently in FEMA's inventory will be installed, newly occupied, or (unless for the purposes of rendering into scrap) sold, excessed, transferred, or donated to any individual or entity. For units that were sold, transferred,

excessed, or donated *prior to* this Interim Direction, but remain under FEMA control (e.g., a buyer has paid for but not yet taken possession of the unit from a FEMA storage location), the transaction will be allowed to be completed, at the discretion of the unit recipient.

- Any type of manufactured housing, the construction of which is regulated by HUD; which meets or exceeds HUD standards; and which is designed for long-term habitation, may continue to be installed in support of and occupied by eligible disaster victims, or sold, excessed, transferred, or donated to any qualified individual or entity.

- Should the current eligible occupant of any FEMA-owned travel trailer or park model request replacement or alternative accommodations, they will be:

  - Authorized rental assistance up to the current authorized fair market rate.

  - Offered a manufactured housing unit on a group/commercial site, if available.

  - Authorized to relocate to a hotel/motel at the authorized rental rate, if rental housing or a FEMA-provided manufactured housing unit is <u>not</u> available within a reasonable distance (as determined by either their current residential location or their place of employment, and the occupant does not wish to relocate beyond the 50-mile radius. Hotel/motel accommodations will remain authorized until an alternative housing unit within the 50-mile radius is available, at which time the hotel/motel authorization will be rescinded. The Associate Deputy Administrator for Gulf Coast Recovery may modify the distance requirement, where appropriate.

  - Authorized to relocate to a rental unit anywhere within the continental United States. In such cases, the occupant will be authorized transportation assistance, in addition to rental assistance up to the current authorized rate.

- For residents of recreational vehicle (travel trailer or park model), FEMA will develop and implement an aggressive program to utilize the authority of the Stafford Act to direct residents into leased apartments/rental units. The program will:

  - Be authorized to provide rental assistance above the current fair market rate limit of 125%, but not more than 150% (unless approved by the Assistant Administrator of Disaster Assistance).

  - Prioritize the downsizing and closure of recreational vehicle group sites.

  - Offer transportation assistance to occupants who wish to relocate to a rental unit (or other alternative housing solution) in a geographically distant venue.

- FEMA will refund the purchase price of any recreational vehicle sold, within the last 12 months, directly to an occupant, upon repossession of the unit.

- FEMA will not purchase or lease any additional travel trailers or park models. FEMA may, if necessary, purchase or lease HUD-regulated manufactured housing, provided such housing meets or exceeds HUD standards.

Testing

- Pending the provision of an interim indoor air quality target level by a qualified federal agency, and design of an approved testing protocol, FEMA will not conduct by-request air quality tests of temporary housing units.

- State and local governments, and occupants, are authorized to independently conduct air quality tests of FEMA temporary housing units, on a non-reimbursable basis. Such testing is optional, and not a prerequisite for requesting alternative accommodations.

- FEMA will follow all Occupational Safety and Health Administration (OSHA) guidelines.

Unit Storage Considerations

- Emergency Housing Storage Sites are currently receiving approximately 1500 returned/deactivated units per week. With the suspension of recreational vehicle sales (which were occurring at a rate of approximately 1200 per week), additional temporary land will be immediately required within the Gulf Coast Recovery Office area of operation to meet ballooning capacity needs. Proposed additional sites for immediate storage are identified below.

State	Location	Total Acreage	Approximate Capacity
Alabama	Craig Field	Unknown	600 MH
Mississippi	Lumberton	300	20,000 TT
Louisiana	St. Gabriel	500	25,000 TT
Texas	Jasper	500	25,000 TT

- The Logistics Management Directorate will continue with current plans to close the Fort Pickett, Virginia site, as well as keep closed the recently vacated Madison, Indiana site.

- Implementation of the Emergency Housing Unit Transition Plan will proceed with operational and tactical control of the sites transitioning to the Transitional Recovery Offices. Strategic oversight will remain with the Logistics Management Directorate, in coordination with the FEMA Administrator and the Deputy Administrator.

Communications

FEMA will, during this interim period:

- Establish an information portal on the FEMA.gov homepage that provides updates on actions taken, available data about formaldehyde and airborne contaminants, Q&As, FAQs, points of

contact within the government, and other information that may be helpful to occupants and other interested parties.

- Provide new informational flyers to all occupants outlining, in simple terms, how this interim direction affects them, as well as information for individuals who may be at a higher risk of formaldehyde sensitivity.

- Provide informational flyers on a periodic basis reporting on the progress of the CDC-led research effort into the effects of formaldehyde, as well as advising of any significant changes to this interim direction.

- Continue to operate a toll-free number in support of occupant/recipient/buyer concerns. This toll-free number will remain staffed between 6 am and midnight Eastern, 7 days a week (hours may be subsequently increased or decreased, as warranted by call volume).

R. David Paulison
Administrator

Garratt, David

From: Jamieson, Gil [gil.jamieson@dhs.gov]
Sent: Saturday, August 18, 2007 11:14 PM
To: Garratt, David
Subject: Fw: TT Replacment Housing

What I'm struggling with is that if we are not basing on decision on standards of construction alone OK-I disagree but will move on ! You then however seem to be all about size and capacity of HVAC /sq ft of living space --is this ratio diminished in the Alt Housing units? They are larger and were judged to be a better living alternative in part because of additonal living space and configuration of that space and well as safety from a wind load design perpective-in point of fact, it is the use of better more rigid constarction material necessary to meet wind load standards that results in less F .You need to look at this. No body wants to get out of the TT business more than I. I'm on record down here with saying that I hated TT (as a housing solution) in 1972 and I hate them now. But you need to find some flexibility in order to meet future housing missions-and it needs to happen quickly.

Sent using BlackBerry

-----Original Message-----
From: Jamieson, Gil
To: 'david.garratt@dhs.gov' <david.garratt@dhs.gov>
Sent: Sat Aug 18 22:53:10 2007
Subject: Re: TT Replacment Housing

Thanks--concerning your final point exposure characteristics -have we authortativly concluded that they do not?

Sent using BlackBerry

-----Original Message-----
From: Garratt, David <david.garratt@dhs.gov>
To: Jamieson, Gil <gil.jamieson@dhs.gov>
Sent: Sat Aug 18 22:31:22 2007
Subject: Re: TT Replacment Housing

The allowance for MHs is not based on an independent determination by FEMA that the units are "safe," in terms of formaldehyde exposure levels. FEMA does not have the expertise/capability to render such an authoritative determination. Instead, it is based on the fact that mobile homes are (1) by virtue of their size, designed for long-term habitation and commercially sold for that purpose; and (2) constructionally regulated and approved by HUD for long-term use; and (3) equipped with HVAC systems that generate an inside/outside air exchange that significantly exceeds the rate of exhange in TTs and PMs.

HUD has approved construction standards for manufactured housing of a certain dimension (mobile homes). Simply applying those construction standards to units of smaller dimensions does not mean those units will exhibit the same exposure characteristics.

-----Original Message-----
From: Jamieson, Gil <gil.jamieson@dhs.gov>
To: Garratt, David <david.garratt@dhs.gov>
Sent: Sat Aug 18 22:12:07 2007
Subject: Re: TT Replacment Housing

Are you certain they don't-this is good info was under the impression that our decision was all based on MH mfg in complinace with HUD standard vice not with TT __you seem to be suggesting that we have determined MH to be safe-how is that without and air quality standard and tests against that standard...

Sent using BlackBerry

-----Original Message-----
From: Garratt, David <david.garratt@dhs.gov>
To: Jamieson, Gil <gil.jamieson@dhs.gov>; Castillo, Carlos <Carlos.Castillo@dhs.gov>
CC: Paulison, Robert David <david.paulison@dhs.gov>; Johnson, Harvey E <harvey.e.johnson@dhs.gov>; Wells, Tod <tod.wells@dhs.gov>
Sent: Sat Aug 18 17:58:02 2007
Subject: Re: TT Replacment Housing

Rebuttal on moratorium: the prohibition is in place because we cannot assure occupants the units are safe. Nor can we assume HUD certification provides such assurance, as it applies to formaldehyde levels, for structures that are smaller than mobile homes and that do not possess an inside-outside air circulation/exchange at least equal to a HUD-required mobile home.

-----Original Message-----
From: Jamieson, Gil <gil.jamieson@dhs.gov>
To: Garratt, David <david.garratt@dhs.gov>; Jamieson, Gil <gil.jamieson@dhs.gov>; Castillo, Carlos <Carlos.Castillo@dhs.gov>
CC: Paulison, Robert David <david.paulison@dhs.gov>; Johnson, Harvey E <harvey.e.johnson@dhs.gov>; Wells, Tod <tod.wells@dhs.gov>
Sent: Sat Aug 18 17:14:05 2007
Subject: Re: TT Replacment Housing

Thanks-- moratorium is in place because TT are not built to the HUD standard--AHPP units are built in conformance with this standard-- same as MHs.

Expensive in comparison to TT but comparable to cost of MH.

Rogering up to three-but what is that alternative?

Suggest we get preliminary results and a reco from HUD..

Sent using BlackBerry

-----Original Message-----
From: Garratt, David <david.garratt@dhs.gov>
To: Jamieson, Gil <gil.jamieson@dhs.gov>; Castillo, Carlos <Carlos.Castillo@dhs.gov>
CC: Paulison, Robert David <david.paulison@dhs.gov>; Johnson, Harvey E <harvey.e.johnson@dhs.gov>; Wells, Tod <tod.wells@dhs.gov>
Sent: Sat Aug 18 16:59:29 2007
Subject: RE: TT Replacment Housing

Quick thoughts; not necessarily concerns:

One: We have a moratorium in place on recreational vehicles, which includes Park Models.

Two: Mississippi Cottages are a very expensive substitute for TTs.

Three: My understanding is that leadership wants us out of the manufactured housing business, and prefers alternate solutions that do not involve another form of manufactured housing.

Four: Since we have not (under the AHPP) evaluated the operational efficacy of the Mississippi Cottages yet, we are taking a risk (although probably a negligible risk) by employing them prior to the results of that assessment.

From: Jamieson, Gil [mailto:gil.jamieson@dhs.gov]
Sent: Saturday, August 18, 2007 4:30 PM
To: Castillo, Carlos; Garratt, David
Cc: Paulison, Robert David; Johnson, Harvey E
Subject: TT Replacment Housing

In my meeting yesterday with Gov Barbour, we discussed using Alt Housing (Mississippi Cottages and Park Models) as replacments for TT usage this Hurricane Season. We also discussed departing from their lottery strategy for occupancy under the Alt Housing Progam to help address the formaldehyde issue i.e., use these units to swap out of TT when we have complaints..All are all on board.

We then talked about the propsects of surging production to meet future demand for temp housing this hurricane season. I was receptive and asked them to flesh out the idea in a paper. I also asked them to bundle the idea with the notion of the State assuming greater responsibility for the housing mission a la S2's idea. Under this senario, they would surge production, manage the program and be reimbursed by us thru IAA.. No commitments, just exploring the art of the possible. Thoughts.

Sent using BlackBerry

Johnson, Harvey E

From: Lapinski, Michael
Sent: Sunday, September 23, 2007 3:26 PM
To: Johnson, Harvey E
Cc: Jamieson, Gil; Garratt, David; Donley, Diane; Lang, William L Dr; Heighberger, Eric B
Subject: RE: Weekly Update

Admiral,

By the terms of the IAA, they were to have begun sampling by Sept 6 (3 weeks from signature). That was even after the long delay between approving the draft IAA and actually signing it. And while they are beginning sampling this coming week, this is just a limited number of samples to establish the protocols for the testing that will be needed to support the report due in December.

I really wish we were moving ahead on data gathering more expeditiously, to support our policy agenda, which is moving along nicely. I will learn the art of the possible from the field team this week.

V/Resp...Mike

From: Johnson, Harvey E
Sent: Friday, September 21, 2007 7:18 PM
To: Lapinski, Michael; Jamieson, Gil; Garratt, David
Cc: Souza, Kevin; Lyle, Mary Anne; Donley, Diane; Williams, Pamela; Shulman, Dan; Podolske, Lew; Lang, William L Dr; Heighberger, Eric B; Lake, Merritt
Subject: RE: Weekly Update

Mike – I take from this that the actual sampling will not start until the new FY? When was it supposed to start?

From: Lapinski, Michael
Sent: Friday, September 21, 2007 4:57 PM
To: Johnson, Harvey E; Jamieson, Gil; Garratt, David
Cc: Monette, Ted; Lapinski, Michael; Souza, Kevin; Lyle, Mary Anne; Donley, Diane; Williams, Pamela; Torres, Johnathan; Shulman, Dan; Smith, Heather R; Podolske, Lew; McDonald, Blair; Lang, William L Dr; Heighberger, Eric B; Brown, Bronson; Chawaga, David J; Walker, Mary-Margaret; Kizziah, Dennis; Lake, Merritt; Hoey, Phillip; Wisko, Tammi; Dyson, Nicole
Subject: Weekly Update

Admiral / Mr. Jamieson,

We had another very productive weekly peer group meeting today. Our Weekly Update as both email text and word attachment.

V/Resp...Mike

****

Policy Objective – *"Advocate establishment of a federal approved air quality standard or guideline, with defined testing protocols, and articulate the responsibility for managing compliance in Emergency Housing Units (EHUs)."*

RVIA Resolution – This week, the Recreational Vehicle Industry Association (RVIA) adopted a resolution requiring members to meet or exceed HUD formaldehyde standards for all units

produced after December 31, 2007. The press statement promised, "We will keep up to date with the latest scientific knowledge and adjust our requirements as new information becomes available", opening the door for sharing results of our Fall '07 assessment and potentially gaining this key support for a defendable federal standard.

We will meet with RVIA in two weeks, following the preliminary assessment work. Discussion will include standards and preliminary discussion of our future inventory reduction policy. They have indicated a willingness to work with us, and may be a partner on both of these key initiatives.

CDC Assessment – A FEMA team is traveling to Columbia, MS next week for the 9/25 kickoff of the assessment at two or more staging sites in Central Mississippi. FEMA representatives will be at the kickoff and work with CDC reps and the sub-contractors to develop a comprehensive sampling plan to meet our policy needs. We expect the full assessment to begin after the start of FY 08. As stated last week, a primary objective of the sampling plan is that it must yield data that will enable us to prioritize the bulk of our current 112,000 EHU inventory along a "Deploy – Dispose Continuum."

We intend to do some preliminary testing of a substance called Chabazite that reportedly neutralizes formaldehyde on contact. This may offer an inexpensive and nearly foolproof method to improve air quality and advance our stated objective of offering victims "a safe and healthy place to reside during their recovery." The intent is that chemical mitigation would make safe units safer, not enable us to keep low quality units in our inventory.

Note: From the GSA Resource website – "ZS500KMnO4 (a bulk crystal product) is chabazite impregnated with 5% potassium permanganate by weight. It is designed to oxidize gaseous contaminants such as hydrogen sulfide, sulfur dioxide, formaldehyde and ethylene even at high relative humidities."

Employee Testing – FOH performed personal air monitoring for formaldehyde on FEMA Individual Assistance (IA) employees while the employees performed trailer inspection activities at the Mary Queen of Vietnam trailer park and University of New Orleans trailer park, Louisiana. FEMA has not received sampling results. FOH has developed engineering control concepts and is waiting the delivery of direct read instrumentation. FOH is preparing to perform field-testing in Selma, Alabama the week of October 1. FOH remains in close contact with the CDC assessment team and is sharing protocols, observations and data.

Formaldehyde Hotline – We have begun tracking a metric that compares total hotline requests to move versus number of households moved. The source for this metric also includes the number of households that want to stay in the TT, but have the unit tested. After we get data to help us support a standard, we may want to consider individual unit testing in order to prioritize moves or help occupants make informed decisions on housing alternatives.

Call roll up (numbers are approximate and there is some double counting on relief request options)

Total Number in a TT:		52,000
Total Number Request a Move:		2500
Request to move to rental assist:		1830
Request move to FEMA MH:		500
Request to move to a hotel:	200	

Request move back to residence:	90
Refused all alternatives:	400

Housing Action Plan – We de-populated 959 households last week, a slightly more aggressive rate than the 700 average of the previous six weeks, and continuing an upward trend. Most of those de-populations are from private sites to principal dwelling. However, 139 de-populations last week were from group or commercial sites going to an alternative housing program. We have not yet isolated how many of those 959 were formaldehyde hotline registrants, but we hope to begin tracking that with next week's report.

External Affairs – This week, we learned of a unilateral CDC plan to engage with Gulf Coast TT occupants and advise them of health risks. This seems to be in reaction to their internal disconnect on the February 1, 2007 Health Consultation that recently came to light. Public Affairs is working with CDC Enterprise Communications to better align their need for expediency with our need for accuracy and specificity.

CDC delayed launching their information campaign until we are better aligned, and until we both have the preliminary results of the Expert Panel, which held their initial session last week.

Brown, Bronson

From: Johnson, Harvey E
Sent: Monday, October 22, 2007 3:39 PM
To: Lapinski, Michael; Castillo, Carlos; Garratt, David; Jamieson, Gil; Philbin, John (Pat)
Cc: Monette, Ted; Brown, Bronson; Chawaga, David J; Donley, Diane; Dyson, Nicole; Hoey, Phillip; Kizziah, Dennis; Lake, Merritt; Lang, William L Dr; Lyle, Mary Anne; McDonald, Blair; Podolske, Lew; Sevier, Adrian; Shulman, Dan; Smith, Heather R; Souza, Kevin; Torres, Johnathan; Walker, Mary-Margaret; Heighberger, Eric B
Subject: RE: Weekly Update

All good info. I do want a discussion here before a sampling plan is approved. Want to ensure that we have our media and Hill message ready, are engaged with our State partners, and have DHS up to speed. We need to look forward to anticipate the readings we are going to get, compared to the 0.1ppm standard, and how we are going to respond when and if that level is exceeded. This is a big deal that merits a brief to the Chief to gain his approval.

I've included Pat Philbin on this e-mail to ensure that this ratchets up on the agenda in External Affairs.

Please coordinate with Eric when you think we have sufficient info to support a meeting.

-----Original Message-----
From: Lapinski, Michael
Sent: Monday, October 22, 2007 8:04 AM
To: Johnson, Harvey E; Castillo, Carlos; Garratt, David; Jamieson, Gil
Cc: Monette, Ted; Brown, Bronson; Chawaga, David J; Donley, Diane; Dyson, Nicole; Hoey, Phillip; Kizziah, Dennis; Lake, Merritt; Lang, William L Dr; Lyle, Mary Anne; McDonald, Blair; Podolske, Lew; Sevier, Adrian; Shulman, Dan; Smith, Heather R; Souza, Kevin; Torres, Johnathan; Walker, Mary-Margaret
Subject: RE: Weekly Update

Admiral,
The numbers that are "out there" are 0.1 ppm, which is the NASA standard, and is further supported by the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE). The California Air Resources Board and Dept of Health have set 0.1 ppm as their "action guideline", meaning above that requires active mitigation. In the absence of a medical/scientific agency coming forward with a contrary number, as you suggest 0.1 ppm will likely become the de facto standard.

I've asked DHS (OHA)--Bill and Merritt--to come over this week for a discussion on risk, the standard and what we might expect from the Expert Panel. I propose we have this discussion before considering approval of the CDC Sampling Plan. And we have not yet seen a draft of that sampling plan.

V/Resp...Mike

-----Original Message-----
From: Johnson, Harvey E
Sent: Sunday, October 21, 2007 6:39 PM
To: Lapinski, Michael; Castillo, Carlos; Garratt, David; Jamieson, Gil; Monette, Ted; Philbin, John (Pat)
Cc: Brown, Bronson; Chawaga, David J; Donley, Diane; Dyson, Nicole; Hoey, Phillip; Kizziah, Dennis; Lake, Merritt; Lang, William L Dr; Lyle, Mary Anne; McDonald, Blair; Podolske, Lew; Sevier, Adrian; Shulman, Dan; Smith, Heather R; Souza, Kevin; Torres, Johnathan; Walker, Mary-Margaret
Subject: Re: Weekly Update

Thanks for the update. Have some concern for proper launch of test of occupied TTs. Will want assurance that we are ready, and opportunity to advise on Hill and at DHS. Still concerned we will have validated testing results and no standard to which appply. Presime 1.0 ppm will become defacto standard.

Want to discuss before green light given to proceed.

Sent from my BlackBerry Wireless Device

-----Original Message-----
From: Lapinski, Michael
To: Castillo, Carlos; Garratt, David; Jamieson, Gil; Johnson, Harvey E; Monette, Ted; Philbin, John (Pat)
CC: Brown, Bronson; Chawaga, David J; Donley, Diane; Dyson, Nicole; Hoey, Phillip; Kizziah, Dennis; Lake, Merritt; Lang, William L Dr; Lyle, Mary Anne; McDonald, Blair; Podolske, Lew; Sevier, Adrian; Shulman, Dan; Smith, Heather R; Souza, Kevin; Torres, Johnathan; Walker, Mary-Margaret
Sent: Fri Oct 19 17:09:40 2007
Subject: Weekly Update

Admiral/ Mr. Jamieson/ Mr. Castillo,

The 10/19 Weekly Update on the Task Force work and peer group status in both email and as a word attachment.

V/Resp…Mike

CDC Assessments

Occupied trailers -- CDC has selected a sub-contractor to conduct the sampling of occupied trailers. They intend this to begin in the next ten days. However, they have not yet provided us with a sampling plan. The Peer Group feels strongly that we need to:

* see and approve that plan,
* conduct Congressional staff briefs,
* develop a media plan,
* prepare occupant / disaster victim FAQ packages, and
* train GCRO Community Relations personnel,

all before the first phone call or visit to a household.

We expected to see the draft plan today and clear by next Wednesday 10/24. External Affairs has already begun preparation of a comms plan, but is waiting on the specifics from the sampling protocols. All CDC communication materials and scripts must be vetted by External Affairs both here in HQ and at the GCRO prior to distribution or engagement.

CDC will conduct a random selection process, then forward the list of target occupants to us, so GCRO and TROs can prepare. We intend to mass mail all occupants to let them know they may receive a call. CDC contractors, accompanied by a GCRO employee will provide more specific information to selected occupants, using approved handouts as they accompany the testing teams.

When the sampling begins, we expect they'll use six to eight teams, sampling five households per day. At that rate, the sampling would take approximately ten business days.

Unoccupied trailers -- CDC has not yet selected a sub-contractor for sampling the unoccupied trailers. NIOSH believes it will take two weeks to prepare a statement of work and a month before the contract is out.

However, as part of the study, the NIOSH team returned to the Gulf Coast to gather sample formaldehyde-laden materials from inside the trailers to test mitigation strategies. They will return next week to "deconstruct" several trailers, gathering additional materials to test mitigation strategies in conjunction with Lawrence Berkley National Labs over the next two to three weeks.

We have successfully linked the mitigation effort to ongoing work at Lawrence Berkley, University of Washington, Texas A&M, and industry.

We intend to ask CDC to provide mid-period reports in person here at FEMA HQ, and to be available for teleconference reports on completion / submission of the respective sampling plans.

Housing Action Plan – Total Number of households remaining in a TT: 48,090

We de-populated 572 households this past week. This number is lower than previous weeks, but the percentage of de-populations transitioning to CLC Prime is increasing. GCRO believes that positive trend is the result of aggressive meetings with landlords to better explain the program and answer their questions in an open forum.

External Affairs –

Media – The New York Times article we anticipated ran this past week (reporter Robert Blumenthal – Houston Office). The feature article focused on a fixed income couple who wanted to buy their trailer as the only affordable housing solution. The articled referenced trailer numbers, the resale program, residential repair / replacement payments, the future rental payment program and synopsized the upcoming CDC study of occupied trailers.

Industry – We expect RVIA Vice President for Congressional and Governmental Affairs to visit FEMA Headquarters this coming week. We'll discuss the CDC study and mitigation strategies that are under consideration. We would like to see industry consider upgrading the air handler during construction to provide better VOC adsorption as part of their formaldehyde reduction pledge. This should also reduce the cost of post-consumer replacement air handlers for existing models.

RVIA is very concerned that unqualified readings from the CDC study will be mischaracterized in the media if CDC releases raw data. We share this concern and will work closely with the multiple external affairs offices at CDC.

Academia – CDC – NIOSH, is now working with both DHS/NASA and Texas A&M on their respective, ongoing formaldehyde mitigation studies.

Garratt, David

From: Smith, Heather R

Sent: Wednesday, October 31, 2007 5:51 PM

To: Smith, Heather R; 'Lake, Merritt'; 'Lang, William L Dr'; Lapinski, Michael; Garratt, David; Souza, Kevin; Wells, Tod; Dannels, Donna; Blanchard-Mbangah, Shauna M; Bailey, Leslie; Castillo, Carlos; Jamieson, Gil; McQueeney, Michelle; McDonald, Blair; Josephson, Robert L; Torres, Johnathan; Donley, Diane; Sevier, Adrian; Baca, Anna Marie ; Allen, Jotham; Carleton, John; Knocke, William R

Cc: Kaplan, James; Walker, Aaron; Walker, Mary-Margaret; 'Shulman, Dan'; Humphreys, Amy; Worley, Lara; Dyson, Nicole; Widomski, Michael

Subject: RE: CDC Testing -- EXTERNAL AFFAIRS MATERIALS -- NEED YOUR APPROVAL

Importance: High

Attachments: Draft Paulison Statment on CDC study 10312007.doc; CDC flyer for testing units_10 31.doc; Formaldehyde Press Release 10-31-07c.doc; FAQs 10 31 07.doc; FEMA Communications Plan on CDC sampling_10.31.doc

All –
At the meeting with the Admiral last Friday, he did not want testing to move forward until FEMA had developed an action plan for addressing the test results (i.e. if results are high, occupants will need to vacate units). The attached materials reflect this change.
The contractor has contacted applicants and made appointments for testing to begin on Friday in Mississippi. We plan on briefing the Hill on Friday.

We need DHS OHA, DAD, GCRO and OCC approval – please review and provide comments by 12 pm Thursday:

- Press release
- Statement by Administrator Paulison
- FAQs
- Talking Points (on the 2nd and 3rd page of the Communications Plan)
- Occupant flyer for those participating in the assessment

Thank you!!!!

From: Smith, Heather R
Sent: Wednesday, October 24, 2007 10:59 AM
To: 'Lake, Merritt'; 'Lang, William L Dr'; Lapinski, Michael; Garratt, David; Souza, Kevin; Wells, Tod; Dannels, Donna; Blanchard-Mbangah, Shauna M; Bailey, Leslie; Castillo, Carlos; Jamieson, Gil; McQueeney, Michelle; McDonald, Blair; Josephson, Robert L; Torres, Johnathan; Donley, Diane; Sevier, Adrian; Baca, Anna Marie ; Allen, Jotham; Carleton, John
Cc: Philbin, John (Pat); Kaplan, James; Walker, Aaron; Walker, Mary-Margaret; 'Shulman, Dan'; Humphreys, Amy; Worley, Lara; Dyson, Nicole; Widomski, Michael
Subject: CDC Testing -- EXTERNAL AFFAIRS MATERIALS -- NEED YOUR APPROVAL
Importance: High

Good morning,

PLEASE REVIEW all materials and provide comments by 10 a.m. tomorrow.

CDC has engaged the services of a contractor, Constella Group, to conduct testing of formaldehyde levels in the units and have developed a sampling plan where they will begin contacting applicants next week to schedule testing. There will be 300 applicants (chosen at random) that will be tested in MS and LA. There is a sample size of 600 that CDC will use to test 300 applicants (i.e. if one of the 300 occupants says he doesn't want the testing to be done, CDC will contact another on the list of 600). Applicant's who agree to have their units tested will be visited by a testing team consisting of two indoor air quality experts and a FEMA representative.

Garratt, David

From: Lang, William L Dr [bill.lang@dhs.gov]
Sent: Friday, November 02, 2007 11:03 AM
To: Lapinski, Michael; Garratt, David
Cc: Krohmer, Jon; Runge, Jeff
Subject: Important New Information
Importance: High

Dave, Mike-

We just got our first look at an updated re-release of the ATSDR consultation that they did for you (FEMA) from early this year, based on the analyses of unoccupied trailers done last year (the new report is dated October 2007, no specific date – extract below). Merritt Lake heard rumor from a colleague at CDC that this report was re-done and found a copy on the web. This report is based on analysis of the data from the original sampling, together with external scientific analysis to come up with "minimal risk levels" (i.e., the level at which risk from exposure to formaldehyde would be considered minimal). The good news is that, from my semi-lay reading of their bottom-line recommendations, they did exactly what we have been looking for all along: Some public health authority to publish firm, scientifically-based guidelines that give us specific levels to mitigate to. The bad news is that the levels recommended are likely unachievable in almost any residential situation.

I don't mean to be a chicken little, but this seems to me to blow out of the water any logic behind an "interim action level," so now what?? We have a phone call into Mike McGeehin and Gary Noonan to get their take on it.

One good thing to come out of this release is that, in and of itself, it gives us reason to delay sampling until we can digest this.

With this in hand, an option to consider recommending is that we scrap the phase 1 study completely, assuming that there is no way that we can achieve the ATSDR now-published levels, and move straight to the phase 3 study as rapidly as possible. Simultaneously, you could use this "brand-new" data to justify a "full-mobilization" to get people out of trailers ASAP. Of course, that begs the question of "into what" because I doubt there is any new construction or any mobile home that will meet these guidelines.

The only other alternative, as I see it, would be for some "higher level" authority within CDC to publish an interpretation of this data that acknowledges the scientific basis of this data but, back to being the nation's public health risk-assessor, points out that this study just addressed one specific aspect of the public health risks associated with continued utilization of mobile housing in emergency disaster relief, and that it is reasonable from a public health standpoint to accept higher levels, on an interim basis, when the human costs/risks associated with lack of any reasonable housing alternative exceed the strict medical risks from formaldehyde exposure. As part of that, they would have to explicitly endorse the interim action levels and associated plans (or give us new levels).

For Today, my initial thought is that we continue to move forward towards Deputy's Committee and use that meeting as the forum for further discussion with HHS along the lines of the previous paragraph.

-Bill

William L. Lang, MD, MHA
Associate Chief Medical Officer
U.S. Department of Homeland Security
202-254-6785

EXTRACT FROM UPDATED/REVISED REPORT:

ATSDR Regulations and Advisories

October 2007

ATSDR has derived an acute inhalation MRL of 0.03 ppm on the basis of clinical symptoms (increased itching, sneezing, mucosal congestion, transient burning sensation of the eyes and of the nasal passages) and nasal alterations (elevated eosinophil counts and a transient increase in albumin content of the nasal lavage fluid) in humans (Pazdrak et al. 1993). This Minimal Risk Level (MRL) is based on minimal Lowest Observable Adverse Effect Level (LOAEL) of 0.4 ppm and an uncertainty factor of nine (three for use of a minimal LOAEL and three for human variability).

An intermediate-duration inhalation MRL of 0.03 ppm was derived based on a No Observable Adverse Effect Level (NOAEL) of 0.98 ppm and a LOAEL of 2.95 ppm (22 hours per day, 5 days per week for 26 weeks) for clinical signs of nasopharyngeal irritation (hoarseness and nasal congestion and discharge) and lesions in the nasal epithelium (squamous metaplasia and hyperplasia) observed in monkeys (Rusch et al 1983). An uncertainty factor of 30 (3 for extrapolation from animals to humans and 10 for human variability) was used to derive the MRL.

A chronic inhalation MRL of 0.008 ppm was derived based on a minimal LOAEL of 0.24 ppm for histological evidence of mild damage to the nasal epithelial tissue (squamous metaplasia, loss of ciliated cells, goblet cell hyperplasia, and mild dysplasia in biopsied tissue) in formaldehyde exposed chemical workers (Holmstrom et al. 1989c). To derive the MRL, the minimum LOAEL was divided by an uncertainty factor of 30 (3 for the use of a minimal LOAEL and 10 for human variability).

Johnson, Harvey E

From: Runge, Jeff [Jeff.Runge@dhs.gov]
Sent: Thursday, November 15, 2007 9:42 AM
To: Johnson, Harvey E; Paulison, Robert David; Schneider, Paul
Cc: Lang, William L Dr; Coldebella, Gus; Waters, Bennet
Subject: "high levels" > 0.10 language

We are working with CDC this morning to remove the reference to "> 0.10" as "high." It really didn't hit me until I noticed that the number is what the FEMA communicators picked up on.

I'd be ok with "higher levels (over 0.1)" or "relatively higher levels (over 0.1)." NOT "0.010" or any carrying out of decimal places to infer that there is any precision in what is "higher" or "medium," "moderate," or "low." As one who successfully avoided malpractice lawyers for 20 years, I am speaking with considerable sensitivity.

Jeffrey W. Runge, MD
Assistant Secretary for Health Affairs (Acting)
and Chief Medical Officer
U.S. Department of Homeland Security
202-254-6479
jeff.runge@dhs.gov

Garratt, David

From: Garratt, David
Sent: Friday, May 18, 2007 6:34 PM
To: 'Lang, William L Dr'
Cc: Lake, Merritt; Krohmer, Jon; Trissell, David; Sevier, Adrian; Jamieson, Gil; McQueeney, Michelle; Dannels, Donna; Souza, Kevin; Philbin, John (Pat)
Subject: RE: Trailers
Attachments: Formaldehyde Issues for Resolution.doc

Dr. Lang:

I think a Monday meeting is a great idea. There are no meetings on my schedule that day that I cannot reschedule or afford to miss, so pick a good time, and I'll make myself available.

Since our Chief Counsel's office is engaged in litigation on this issue, they are interested in being involved in any action planning for this issue, so I will be inviting them to our meeting, as well.

Reviewed the attachment. From a laymanesque standpoint, looks like you have identified all the right questions. Looking forward to our meeting Monday.

Dave

From: Lang, William L Dr [mailto:bill.lang@dhs.gov]
Sent: Friday, May 18, 2007 4:26 PM
To: Garratt, David
Cc: Lake, Merritt; Krohmer, Jon
Subject: Trailers

Mr. Garratt-

Jeff Runge asked me to touch base with you on what we're doing at OHA so we can make sure we're supporting your efforts. I tried to call, but your assistant said you have meetings fairly continuously the rest of the day. USPHS CDR Merritt Lake in our office is an industrial hygienist who has a significant amount of experience with trailers/mobile homes and formaldehyde, so he's a great resource for us. Looking at it from the standpoint of what clinical/medical information do we need to help clarify these issues, we put together a set of questions for our internal use as we move forward on this (attached). We also talked to the CDC "Coordinating Center for Environmental Health and Injury Prevention" which is the parent of both the Agency for Toxic Substances and Disease Registry and the Center for Environmental Health (which includes CDCs air quality group). They are putting their heads together over the weekend to come up with a recommendation for a best way to take a scientific approach to defining the actual exposure and to documenting how extensive these complaints are. As you imagine, they are somewhat concerned about the difficulty of addressing this as the whole issue of residential indoor air quality (especially in mobile homes, but even in single family houses) always opens more issues than it closes.

As I'm sure you already know, the biggest problem is that formaldehyde is almost ubiquitous, so getting to a level of "zero" is not realistic, so the question is what level is acceptable. Getting the level down to where no one at any age will have any effects is probably possible (at a very high cost), but 99% of people can tolerate higher levels with no adverse effects whatsoever. What those levels and costs are however, is what we don't know.

It might be helpful if we try to get together some time on Monday to go over what we have with what you have and make sure we're moving in the same direction. From a "medical" standpoint, this is a very interesting issue, but it's just like being in the hospital...you never want to be an "interesting" patient!

-Bill Lang

William L. Lang, MD, MHA
Associate Chief Medical Officer
U.S. Department of Homeland Security
202-254-6785

From:	Kirin, Alexandra
To:	Walker, Mary-Margaret; Kirin, Alexandra; Walker, Aaron;
CC:	McIntyre, James; Small, Ashley; Brezany, Eugene; Knocke, William R;
Subject:	RE: media inquiry
Date:	Wednesday, November 07, 2007 3:13:27 PM
Attachments:	

This statement still stands, correct?

AIR QUALITY TESTING IN THE GULF
Various media are inquiring about the postponement of air quality testing in FEMA travel trailers

Statement:

FEMA is working with health and environmental experts at the Department of Health and Human Services and the Centers for Disease Control and Prevention to conduct air quality assessments of temporary housing units issued after hurricanes Katrina and Rita.

As part of that study, the Centers for Disease Control will oversee indoor air quality testing of randomly selected temporary housing units in Mississippi and Louisiana. Testing was to have begun the first week of November, but previously scheduled appointments have been postponed until health and environmental experts finalize the testing process and action levels for responding to the results of the testing are determined. The testing will begin once these matters have been resolved.

Meanwhile, FEMA continues to work actively with all residents to help them move them out of temporary housing units and into more permanent housing that fits their individual needs. More than one-quarter of the occupants who have asked to be relocated from travel trailer units have moved to long-term housing, and the remaining households are evaluating their housing options.

Press Office
U.S. Department of Homeland Security
500 C Street, SW
Washington, DC 20472

FEMA

Jan. 17, 2008
No.: HQ-08-07
FEMA News Desk: 202-646-4600

News Release

FEMA ANNOUNCES REFUNDS FOR TRAVEL TRAILERS PURCHASED BY DISASTER OCCUPANTS AND THROUGH GSA SALES

WASHINGTON – The Federal Emergency Management Agency (FEMA) announced today that it will offer to refund the purchase price of travel trailers or park models to individuals who wish to return units purchased directly from FEMA or through the General Services Administration (GSA). This initiative is part of an ongoing effort to address concerns about possible adverse health effects of formaldehyde associated with recreational vehicles.

For GSA auction sales, refunds for the purchase price of travel trailers and park models will be offered for units purchased through GSA auctions on or after July 24, 2006, until such sales were suspended in July 2007. Individuals who want to return their travel trailer or park model unit must contact FEMA within a 60-day period beginning January 17, 2008

For units sold by FEMA directly to disaster assistance applicants occupying the unit, FEMA will offer to refund the purchase price of any travel trailer or park model sold on or after July 31, 2006, until such sales were suspended in July 2007. The refunds option applies to disasters declared on or after Aug. 29, 2005. Occupants will have 60 days from the date of notification to request a refund.

Buyers must have purchased the units directly from FEMA or GSA. The refunds will be provided upon repossession of the units.

Individuals and disaster applicants, who have questions regarding the purchase of their unit, may call FEMA at 1-866-562-2381 or, TTY 1-800-462-7585.

PURCHASES THROUGH GSA

FEMA will notify via e-mail each individual who purchased a recreational vehicle (travel trailer or park model) sold to the public as excess by FEMA through GSA on-line auction sales. The e-mail will include the refund period and procedures for requesting a refund. Buyers will need to send a written request for a refund to FEMA within 60 calendar days of the initial public notification date, January 17, 2008. The written request must include the GSA Sales Contract Number, the purchaser's name, the purchase price and the purchaser's receipt for payment.

Buyers must submit a Direct Deposit form with an original signature to allow for the electronic deposit of funds and an unsigned, voided check or deposit slip along with a signed and completed Trailer Refund Checklist form. Both forms will be provided via the e-mail notification.

Purchasers must return units to the designated FEMA facility and they will need to turn over the Certificate to Obtain Title, if the purchaser still has the document, and title to the unit itself. FEMA will not reimburse purchasers for upgrades or work done to the unit; individuals are responsible for arranging for transportation or travel and paying for the associated costs.

Refunds will be transmitted to the purchaser's bank account by direct deposit within 30 days of the unit's physical return to the designated FEMA facility.

Refund requests should be sent to FEMA at the following address:

Attn: Logistics Current Operations Branch
Federal Emergency Management Agency
500 C Street SW, Room 330
Washington, D.C. 20472

PURCHASES DIRECTLY FROM FEMA

FEMA will mail a letter to each disaster assistance applicant who purchased their recreational vehicle (travel trailer or park model) directly from FEMA between July 31, 2006, and July 31, 2007, for major disasters declared on or after Aug. 29, 2005, notifying them of the option and procedure for seeking a refund. Buyers who wish to seek a refund will need to contact FEMA within 60 calendar days of the date of the notification letter they receive.

Applicants who contact FEMA through the toll free number will be transferred to the appropriate Transitional Recovery Office (TRO) or field office in order to process the refund request. The TRO or field office will obtain the original Certificate to Obtain Title from the applicant, if the purchaser still has the document, and any other titles the applicants obtained for the unit.

FEMA will deactivate and haul away recreational vehicles for occupants who want to return the units to FEMA for a refund. Refunds will be transmitted to the purchaser's bank account by direct deposit within 30 days of the unit's physical return to FEMA.

For occupants still residing in the recreational vehicle and who are in need of, and remain eligible for, housing assistance from FEMA, a caseworker from the respective field or Transitional Recovery Office will work with the applicant to help them move them into other housing.

###

FEMA coordinates the federal government's role in preparing for, preventing, mitigating the effects of, responding to and recovering from all domestic disasters, whether natural or man-made, including acts of terror.

Interim Findings on Formaldehyde Levels in FEMA-Supplied Travel Trailers, Park Models, and Mobile Homes

from the Centers for Disease Control and Prevention

February 29, 2008

Summary

This interim report of a CDC study provides information about formaldehyde levels in a random sample of FEMA-supplied occupied travel trailers, park models, and mobile homes still being used as of December 2007 and January 2008 as temporary shelter for residents of the U.S. Gulf Coast region displaced by Hurricanes Katrina and Rita. Additional analyses on this study; and additional peer review of the study, its results, and conclusions; are ongoing. A final report on this study will be published in the spring 2008. In addition, other studies related to the health of persons displaced by Hurricanes Katrina and Rita and to formaldehyde levels in travel trailers, park models, and mobile homes are ongoing. However, this interim report suggests that formaldehyde levels in many of the travel trailers, park models, and mobile homes (geometric mean 77 parts per billion [ppb] across all types with many levels higher than this average) are higher than typical U.S. background levels (e.g., approximately 10-30 ppb in indoor air). Therefore, actions should be taken now to limit further exposures to residents. (For specific information, see the report sections below on recommendations to residents and recommendations to public officials).

Background

From December 21, 2007, to January 23, 2008, the Centers for Disease Control and Prevention (CDC) conducted testing to assess levels of formaldehyde in indoor air of a random sample of occupied travel trailers, park models, and mobile homes supplied by the Federal Emergency Management Agency (FEMA) as temporary housing for residents of the U.S. Gulf Coast region displaced by Hurricanes Katrina and Rita. The testing was one of several actions CDC initiated in response to a request from FEMA on July 13, 2007; to investigate concerns about formaldehyde in occupied FEMA-supplied travel trailers, park models, and mobile homes in Louisiana and Mississippi.

Objectives

The objectives of this study were:

1. To determine formaldehyde levels in occupied travel trailers, park models, and mobile homes.
2. To determine factors or characteristics of occupied travel trailers, park models, and mobile homes that could affect formaldehyde measurements.
3. To provide information to assist FEMA in making decisions about when and how to relocate residents from these FEMA-supplied travel trailers, park models, and mobile homes still used in the Gulf Coast area.

It is also important to understand that this study does not address the following:

1. The results should not be applied to travel trailers, park models, or mobile homes

purchased and used in other places and situations because the sample for this study was selected only from FEMA-supplied travel trailers, park models, and mobile homes used in the Gulf Coast region. Other travel trailers, park models, and mobile homes used elsewhere could differ based on their age, the characteristics of their manufacture, the circumstances of their use, or the characteristics of their environment.

2. This is a study of formaldehyde levels, and as such does not assess the health status of persons currently living in FEMA-supplied travel trailers, park models, and mobile homes.

Methods

Definitions

- **Mobile homes** are generally wider than 8 feet and/or longer than 40 feet (for an area greater than 320 square feet). They are built on permanent chassis; contain plumbing, heating, air-conditioning, and electrical systems; and are designed to be used as permanent homes. They are defined and regulated by the U.S. Department of Housing and Urban Development (HUD).
- **Travel trailers** are wheel-mounted trailers designed to provide temporary living quarters during periods of recreation, camping, or travel. Travel trailers generally have size limits, such as no larger 8 feet in width and 40 feet in length, for an area of less than 320 square feet. Travel trailers are generally considered vehicles rather than structures, and they are regulated by state transportation authorities rather than housing authorities.
- **Park models** are larger versions of a travel trailers (up to 400 square feet in area), that are used as temporary living quarters. Park Models are manufactured housing which are administratively exempted from HUD construction standards and are therefore typically regulated by transportation authorities and by manufacturer acceptance of a voluntary American National Standards Institute (ANSI) standard applying to their construction.

Selecting the study population and travel trailers, park models, and mobile homes

CDC randomly selected 519 travel trailers, park models, and mobile homes for testing using a FEMA-provided list of the 46,970 occupied travel trailers, park models, and mobile homes in Mississippi and Louisiana as of November 2007. The number of travel trailers, park models, and mobile homes chosen to be studied was based on power calculations designed to allow researchers to draw statistically valid conclusions for the population being studied (i.e., FEMA-supplied travel trailers, park models, and mobile homes being used in the Gulf Coast region) and for common types of travel trailers, park models, and mobile homes within that population of FEMA-supplied travel trailers, park models, and mobile homes. Disproportionate stratified random sampling was used to select travel trailers, park models, and mobile homes for testing.

The travel trailers, park models, and mobile homes were divided into 11 strata defined by the type of unit most commonly used: travel trailer, mobile home, and park model. The travel-trailer type was divided into seven strata defined by the top six brands[1] (Gulfstream, Forest River, Fleetwood, Fleetwood CA, Pilgrim, and Keystone) that together represented 61% of the occupied travel trailers, park models, and mobile homes being used. The seventh travel-trailer stratum included a combination of all other travel-trailer brands supplied by FEMA. The park-model type had two strata: the most common brand, Silver Creek, that represented 21% of the park models being used, and all other park model brands. The mobile-home type also was divided into two strata: the most common brand, Cavalier, that represented 17% of the mobile homes being used, and all

[1] Note: some brands may be made by more than one manufacturer

other brands. In addition, as the brand of travel trailer in most frequent use by FEMA, the Gulfstream travel-trailer stratum was oversampled.[2]

Study personnel telephoned and enrolled adult occupants for participation in the study according to procedures defined in the study protocol.[3] All participants in the study were required to be older than18 years of age, reside in a FEMA-supplied travel trailer, park model, or mobile home in Mississippi or Louisiana at the time of phone recruitment, and spend at least 6 hours each day in that trailer. If the adult resident declined to participate or was otherwise ineligible, personnel contacted residents of the next travel trailer, park model, or mobile home on the randomized list. When an adult resident agreed to participate, a time was scheduled to conduct the sampling.

Formaldehyde measurement

Trained study personnel and FEMA field workers were present for each scheduled sampling appointment. Staff collected a 1-hour sample of air for formaldehyde in each participating travel trailer, park model, or mobile home using the National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods (NMAM) Method 2016 with Supelco S10 LpDNPH cartridges. They also measured indoor temperature and relative humidity during the sampling period. Residents were asked to configure doors and windows as they would have them while they slept.

[2] Further information on the numbers of trailers in each stratum is shown in Table 2.
[3] Available at http://www.cdc.gov/nceh/ehhe/trailerstudy/

Air samples were collected using standard industrial hygiene pumps. Samples were drawn at a flow rate of 500±50 milliliters per minute for 1 hour. The sampling filter was placed at a height of 4 feet in a central location. One of the trained study personnel observed the sample collection at all times. No cooking or smoking was allowed in the travel trailers, park models, and mobile homes during the 1-hour sample collection period because these activities could have increased formaldehyde levels. Study personnel followed all quality assurance and quality control procedures. Samples were analyzed for formaldehyde levels at the Bureau Veritas laboratory in Novi, Michigan. The Bureau Veritas laboratory is the contract laboratory for NIOSH and has experience with NIOSH data quality objectives.

Additional information about the residents and the travel trailers, park models, and mobile homes

In addition to formaldehyde sampling, a short questionnaire was administered to an adult resident during the 1-hour sample collection process. Information collected in the questionnaire included occupant demographics, unit characteristics, and activities of inhabitants. Study personnel conducted an environmental walk-through survey, observing the unit for factors such as holes and leaks, mold, type of cooking fuel, and working smoke detectors.

Statistical analysis

[1] The ATSRAC minutes, recommendations, and presentations were reviewed at <http://www.mitrecaasd.org/atsrac>.

All statistical analyses were conducted with SAS version 9.1. SAS SURVEYREG, SURVEYMEANS, and SURVEYFREQ were used to account for stratified sampling. Measures of central tendency were expressed as geometric means.[4] Regression models were constructed to assess the influence of temperature, smoking, and selected ventilation properties (i.e., whether windows, scuttles, or doors were open) on the main findings. Fuller analyses that attempt to explain variability in formaldehyde levels are pending and will be presented in the final report.

Consent and human subjects protections

This study was reviewed and approved by the CDC Institutional Review Board, and all human subjects provided informed consent and received appropriate notification of confidentiality.

Results

Overall range and variability of formaldehyde levels

[4] Simple averages (arithmetic means) are not suitable for representing "average" conditions when observations are clustered at one end of the data range. The occurrence of a few high numbers would result in a perceived "average" far higher than a number that would reflect actual conditions. In such situations statisticians use the geometric mean to represent a more accurate estimate of typical conditions. The geometric mean is calculated by adding the logarithms of the individual values, calculating their arithmetic mean, and taking the antilogarithm of the result.

The overall geometric mean (GM) formaldehyde level for all travel trailers, park models, and mobile homes sampled was 77 parts per billion (ppb) with a 95% Confidence Interval (CI) of 69 to 85 and a range of 3 to 590 ppb. The GM formaldehyde level was 81 ppb among travel trailers, 59 ppb among mobile homes, and 40 ppb among park models (Figure 1). The GM formaldehyde levels varied significantly between between travel trailers, park models, and mobile homes, but a wide range of formaldehyde levels were found in each of the three types. All three types contained some units with levels that were elevated (Table 1) relative to usual U.S. background levels (i.e., levels to which persons typically are exposed during daily life, typically 10- 30 ppb in indoor air).[5]

Variability in formaldehyde levels within and across travel-trailer, park-model, or mobile-home types

Different brands of travel trailers, park models, and mobile homes varied in average formaldehyde levels, but each stratum included some units with levels higher than U.S. background levels (Table 2). Except as noted below, controlling for smoking, open windows, temperature, and relative humidity did not change the statistical significance of these relationships.

The travel trailer brands Gulfstream, Keystone, and Pilgrim were not significantly different from each other but each showed statistically significantly higher levels of

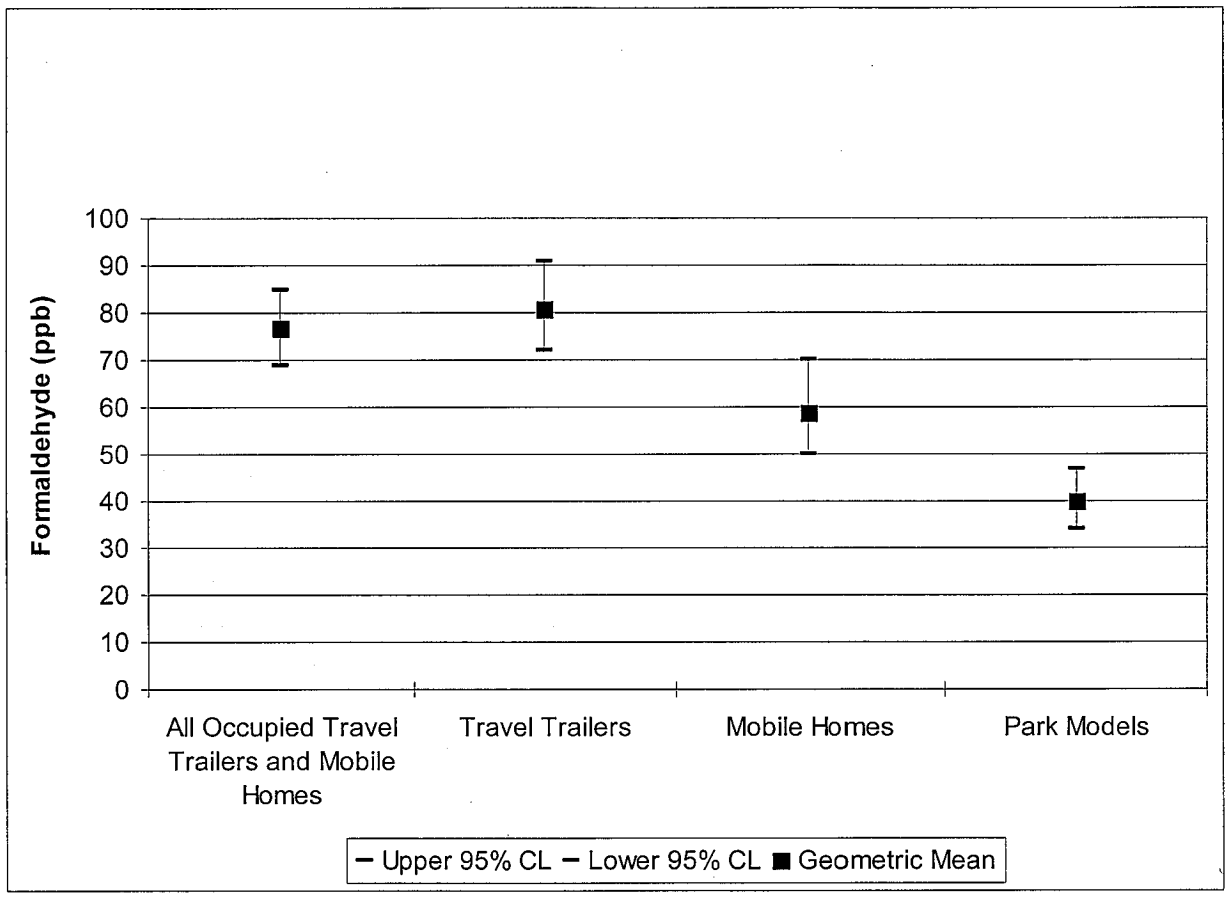
[5] More information about expected background levels is presented in the section on interpreting formaldehyde levels, below.

formaldehyde than the other travel-trailer strata combined. After adjusting for smoking, windows being open, temperature, and humidity, Forest River travel trailers also had significantly higher formaldehyde levels as compared with all other travel trailers combined. Travel trailers from Fleetwood and Fleetwood CA each showed statistically significantly lower levels of formaldehyde compared with the other travel-trailer strata combined, but they were not significantly different from each other.

Park models from Silver Creek showed statistically significant lower levels of formaldehyde compared with the other/unknown park-model stratum.

Unadjusted comparisons of mobile homes from Cavalier to other mobile homes showed statistically significantly higher levels of formaldehyde compared with the other mobile home stratum. However, this difference became non-significant after controlling for smoking, windows being open, temperature, and relative humidity. Thus, at least part of this apparent difference by brand appears to have been due to other confounding factors.

Figure 1. Geometric Mean Formaldehyde Levels in Occupied FEMA-Supplied Travel Trailers, Park Models, and Mobile Homes, Louisiana and Mississippi, December 2007 to January 2008



*GM = Geometric Mean; ppb = parts per billion (divide by 1000 to get parts per million); CL = Confidence Limit.

Table 1. Formaldehyde Levels in 519 Occupied FEMA-Supplied Travel trailers, Park Models, and Mobile Homes in Louisiana and Mississippi, December 2007 to January 2008

Unit Type	n in sample	Formaldehyde GM (ppb)*	Range (ppb)	95 % CI for GM (ppb)	Weighted Percent of the sample with levels ≥	
					100 ppb	300 ppb
Travel Trailer	358	81	3–590	72, 91	41%	6%
Park Model	82	40	3–170	34, 47	9%	0%
Mobile Home	79	59	11–320	50, 70	17%	0%

*GM = Geometric Mean; ppb = parts per billion (divide by 1000 to get parts per million); CI = Confidence Interval.

Table 2. Formaldehyde Levels by Brand in 519 Occupied FEMA-supplied Travel Trailers, Park Models, and Mobile Homes in Louisiana and Mississippi, December 2007 to January 2008

Unit Type	Brand	N in stratum	n in sample	Formaldehyde GM (ppb)*	Range (ppb)	95 % CI for GM (ppb)	Percent of the sample with levels ≥	
							100 ppb	300 ppb
Travel Trailer	Gulfstream	14, 624	121	103	3–580	87, 121	56%	8%
	Forest River	3,220	39	85	17–510	65, 110	44%	5%
	Fleetwood	2,371	44	39	3–140	31, 48	7%	0%
	Fleetwood CA	1,699	38	42	7–300	33, 53	11%	3%
	Pilgrim	1,584	39	108	25–520	85, 136	51%	3%
	Keystone	1,395	38	102	23–480	79, 131	53%	11%
	Other TTs	15,637	39	73	11–590	56, 95	33%	5%
Park Model	Silver Creek	224	38	33	3–100	27, 39	3%	0%
	Other PMs	809	44	42	11–170	35, 51	11%	0%
Mobile Home	Cavalier	921	40	78	14–320	64, 96	38%	3%
	Other MHs	4,486	39	56	11–260	46, 68	13%	0%
	Total	46,970	519	77	3–590	69, 85		

*GM = Geometric Mean; ppb = parts per billion (divide by 1000 to get parts per million); CI = Confidence Interval.

Discussion

This is an interim report of the formaldehyde levels in indoor air from December 2007 to January 2008 in a sample of FEMA-supplied occupied travel trailers, park models, and mobile homes in Louisiana and Mississippi. The final report, which will contain additional analyses and be subject to additional peer review, will be published in the spring 2008.

Key Findings

1) In many travel trailers, mobile homes, and park models tested, formaldehyde levels were elevated relative to typical levels of U.S. indoor exposure. (See section below on interpreting formaldehyde levels for a fuller discussion).
2) Average level of formaldehyde in all units was about 77 ppb and many units had levels that were higher than this average. These levels are higher than U.S. background levels, and at the levels recorded in many travel trailers, park models, and mobile homes health could be affected. Measured levels ranged from 3 ppb to 590 ppb.
3) These measured levels are likely to under-represent long-term exposures because formaldehyde levels tend to be higher in newly constructed travel trailers, park models, and mobile homes and during warm weather.
4) Higher indoor temperatures were associated with higher formaldehyde levels in this study independent of unit type or brand.
5) Formaldehyde levels varied by unit type (travel trailers, mobile homes, and park

models), but all types of travel trailers, park models, and mobile homes tested had some levels higher than usual U.S. background levels.

6) Travel trailers had significantly higher average formaldehyde levels than park models or mobile homes in this study. Travel trailers also had higher proportions of units with formaldehyde levels higher than 100 and 300 ppb than park models or mobile homes in this study.

7) Because some types and brands had lower average formaldehyde levels, there might be ways to manufacture or use travel trailers, park models, and mobile homes in ways that reduce exposures. Additional studies are ongoing that seek to shed additional light on this question.

Interpreting Formaldehyde Levels in Indoor Air

The formaldehyde levels found in travel trailers, mobile homes, and park models in this study were elevated relative to typical background levels. In outdoor air, background formaldehyde levels are below 10 ppb, although on busy city streets levels they can reach the range of 20–40 ppb. Indoor air concentrations in conventional homes typically range from 10–30 ppb. Industrial workplaces can have much higher levels, such as in the range of 1,000 ppb or higher.

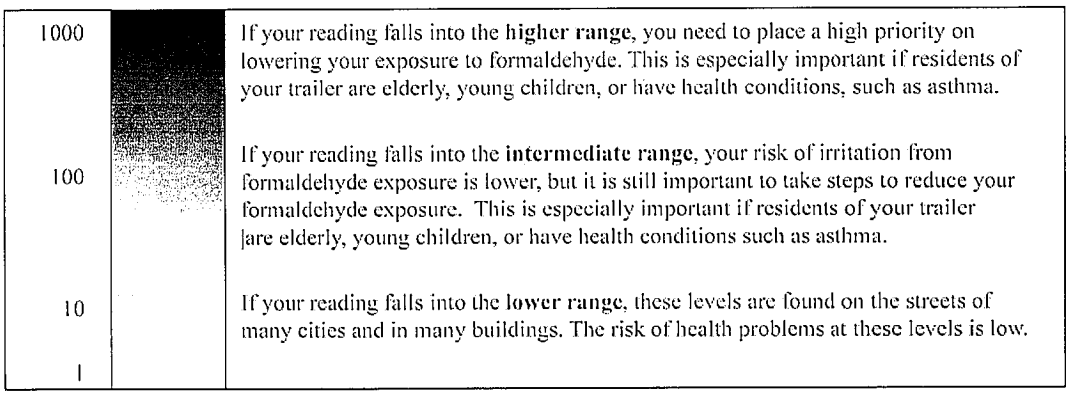
What do formaldehyde levels mean for health? There is no specific level of formaldehyde that separates "safe" from "dangerous."[6] As the formaldehyde level rises,

[6] We have not cited here the various exposure limits that have been developed for formaldehyde because they are widely variable and none relate directly to occupied trailers.

the risk of health consequences rises. At higher levels, people could have acute symptoms such as coughing and irritated eyes and throat. Even at levels too low to cause such symptoms, there could be an increased risk of cancer.

Other factors also contribute to risk, including how much time is spent in the trailer; the age of the occupants, especially if they are very old or very young; and the presence of chronic diseases such as asthma. The ranges of formaldehyde levels, from low single digits up to 1,000 ppb, are shown in Figure 2. At the lower ranges the health risk is quite low, and at the higher range the health risk is substantially higher. This is both for acute symptoms, such as coughing, and for long-term effects, such as cancer. Assessing individual risk and planning ways to reduce risk should be done in consultation with a health professional.

Figure 2: Interpreting the Significance of Formaldehyde Levels



Note: Levels are expressed at parts per billion (ppb). To convert to parts per million (ppm), divide by 1000.

Strengths of This Study

1. The sample of travel trailers, park models, and mobile homes was selected so that statistically valid conclusions could be drawn that would apply to all occupied FEMA-provided travel trailers, park models, and mobile homes in Louisiana and Mississippi. Further, the sample was developed so that statistically valid results could be obtained by unit type and brand.

2. These data were collected using a NIOSH-published and fully evaluated sampling method, and they have been evaluated through a quality assurance/quality control process.

3. The results of the statistical analysis and this report also received peer review inside CDC. Additional peer review will be conducted for the final report.

4. This preliminary report provides important and timely public health information to support ongoing decision making.

Challenges to Interpreting This Information

1. For travel trailers, park models, and mobile homes, no single formaldehyde level or standard exists that can easily distinguish safe from unsafe levels.

2. Formaldehyde levels are lower in cooler temperatures and lower humidity; therefore, levels measured in this study are likely to underestimate those that occurred in the past and those that would occur in the future during summer months.

3. Although average formaldehyde levels by unit type could be useful in helping to prioritize which residents might need to move most urgently, all types include units with relatively higher and lower formaldehyde levels.

4. As noted elsewhere in this report, the results of this study do not necessarily apply to travel trailers, park models, or mobile homes used in other places and situations because this sample was selected to apply only to FEMA-supplied travel trailers, park models, and mobile homes being used in Louisiana and Mississippi. Differences in formaldehyde levels by unit type or brand could reflect differences in unit age, manufacture, environment, or circumstances of use.

5. This study does not assess the health status of people currently living in FEMA-supplied travel trailers, park models, and mobile homes.

Recommendations for Public Health, Emergency Response, and Housing Officials

1) These conclusions support the need to move quickly, before weather in the region warms up, to relocate residents of the U.S. Gulf Coast region displaced by Hurricanes Katrina and Rita who still live in travel trailers, park models, and mobile homes. The highest priority (in order of precedence) should be persons who are

a. currently having symptoms that could be attributable to formaldehyde exposure

b. especially vulnerable (i.e., children, the elderly, and those with chronic diseases), and

c. living in unit types that tend to have higher formaldehyde levels.

2) Follow-up will require multi-agency collaboration—including among FEMA, HUD, CDC, state and local officials, and others—to achieve safe, healthy housing for people displaced by Hurricanes Katrina and Rita who continue to live in travel trailers, park models, and mobile homes.

3) Follow-up will require multi-agency collaboration involving HUD, CDC, the Department of Education, state and local officials, and others to assess the potential for formaldehyde exposure in travel trailers, park models, and mobile homes used in other places and contexts including travel trailers, park models, and mobile homes that are used for recreation, for permanent housing, and in schools.

4) Federal, state, and local officials should consider how best to provide necessary assistance to the Louisiana and Mississippi state health departments to ensure adequate follow-up, including medical needs, for residents with health and medical concerns resulting from formaldehyde exposure while residing in FEMA-provided travel trailers, park models, and mobile homes.

5) Federal, state, and local officials should consider supporting the establishment of a health registry of children and others who resided in travel trailers, park models, and mobile homes in the Gulf Coast region.

Recommendations for Residents Awaiting Relocation

1) Spend as much time as possible outdoors in fresh air.

2) Open windows as often as possible to let in fresh air.

3) Try to maintain the temperature inside travel trailers, park models, and mobile homes at the lowest comfortable level.

4) Do not smoke, especially not inside.

5) If you have health concerns, see a doctor or another medical professional.

6) All of these recommendations particularly apply to families that include children, the

elderly, and those with chronic diseases such as asthma.

Further CDC Action

1) CDC began notifying participants about the study results on February 21, 2008, with personal visits by members of the U.S. Public Health Service Commissioned Corps and FEMA representatives, and by hand-delivered letters.

2) At a series of "public availability sessions" in Louisiana and Mississippi, CDC staff will be available to talk with concerned and interested individuals to provide information and answer questions.

3) Other factors might affect formaldehyde levels, and CDC will be analyzing the data further to assess these factors. Further internal and external peer review of the data and conclusions is ongoing or planned. A final report on this study is expected later in the spring 2008. Understanding variability in formaldehyde levels is a key step in reducing ongoing exposures. Other work related to characterizing exposures and health effects among displaced residents is continuing.

4) CDC is assessing formaldehyde levels across different models and types of unoccupied travel trailers, park models, and mobile homes to identify factors that reduce or heighten those levels. This assessment also involves identifying cost-effective ways to reduce or lower formaldehyde levels and concentrations in travel trailers, park models, and mobile homes.

5) CDC is developing a protocol for a long-term study of children who resided in FEMA-supplied travel trailers, park models, and mobile homes in Mississippi and

Louisiana.

6) CDC is providing educational materials and information to residents of travel trailers, park models, and mobile homes about their risk of exposure to formaldehyde and ways to improve indoor air quality and health.

7) CDC will reconvene the panel of experts it has used previously on this issue to identify and provide input on health issues that could be associated with long-term residence in travel trailers, park models, and mobile homes.

For Additional Information

Operators at CDC's 24-hour, toll-free telephone hotline will continue to respond to health-related questions from residents. The hotline number is 1-800-CDC-INFO (1-800-232-4636). Additional information is also available at www.cdc.gov/environmental.

Final 2/1/07 5:02pm

Health Consultation

Formaldehyde Sampling at FEMA Temporary Housing Units

Baton Rouge, Louisiana

February 1, 2007

Agency for Toxic Substances and Disease Registry

Executive Summary:

The ATSDR Emergency Response program was requested by the Federal Emergency Management Agency (FEMA), Office of Chief Counsel to review and provide an evaluation of analytical data related to a project involving formaldehyde sampling at FEMA temporary housing units/trailers located in Baton Rouge, Louisiana.

The objectives of the sampling project included the establishment of general baseline concentrations of formaldehyde and other VOCs in the 96 trailers involved in the study, in addition to the evaluation of the effectiveness of two separate and distinct ventilation practices used on these particular trailers to reduce the concentrations below levels of health concern. In Group A, ventilation was provided by running the air conditioning system with the bathroom static vents open; in Group B, ventilation was provided by opening windows and vents. The study involved a 14 day sampling period and was not intended to evaluate longer term formaldehyde levels or potential exposures for trailer residents.

The purpose of the ATSDR consultation is to provide FEMA a clearer understanding of the issues associated with formaldehyde in temporary housing units. The consultation is not intended to establish FEMA's future policy concerning temporary housing units. The conclusions derived from the sampling of the 96 trailers are for those trailers only, and are not necessarily applicable to all other trailers due to numerous variables for which appropriate data and information are not available.

In the 96 trailers sampled, the method of ventilation used in trailer group B, of opening all windows, static vents, and exhaust fan vents, was more effective at lowering the concentration of formaldehyde during the period of this sampling project than the method of ventilation used in trailer Group A of running the air conditioning system with the bathroom static vents open. The method of ventilation which allowed for the greatest number of air exchanges was the most effective in lowering the concentration of formaldehyde.

The average concentration of formaldehyde per day in Group B trailers, after the fourth day of sampling and for the remainder of the study, was below the level of concern for sensitive individuals of 369 ug/m3 (0.3 ppm). The average concentration of formaldehyde per day in Group A trailers was above the level of concern for sensitive individuals in all but two days of the study. Individuals previously sensitized to formaldehyde may experience symptoms above 369 ug/m3 (0.3 ppm). A combination of ventilation methods, in addition to Method A, may be necessary to reduce formaldehyde concentrations below levels of health concern for sensitive individuals.

The concentrations of the other VOCs detected during the sampling project were below levels expected to produce adverse health effects.

FEMA has not requested ATSDR to evaluate longer-term formaldehyde concentrations in trailers or health concerns related to potential exposures. ATSDR will be available to provide assistance if such data becomes available in the future.

Formaldehyde Sampling at FEMA Temporary Housing Units
Baton Rouge, Louisiana

I. Background and Statement of Issues:

The ATSDR Emergency Response program was requested by the Federal Emergency Management Agency (FEMA), Office of Chief Counsel to review and provide an evaluation of analytical data related to a project involving formaldehyde sampling at FEMA temporary housing units located in Baton Rouge, Louisiana. The examples of temporary housing units used in the study are similar to those utilized by Hurricane Katrina displaced persons. The sampling project was being conducted by the U.S. Environmental Protection Agency (EPA), as requested by FEMA. ATSDR was requested to provide an evaluation of the data once the sampling project was completed by EPA. The initial request for ATSDR assistance with the data evaluation occurred on a conference call held on July 13, 2006. The sampling was completed by EPA on October 10, 2006. On December 6, 2006, the ATSDR Emergency Response program received a DVD from FEMA, OGC containing the analytical data for review.

FEMA had requested EPA to conduct a sampling and analytical program to evaluate formaldehyde and other volatile organic compounds (VOCs) in indoor air, inside FEMA selected and supplied temporary housing units or trailers. Air samples were collected and analyzed from new, unused trailers with and without the heating, ventilation and air conditioning (HVAC) systems operating. The indoor air samples were collected from a total of 96 new, unused trailers that were produced by eight separate manufacturers. A target of twelve trailers per manufacturer was identified by FEMA for analysis. The sampling was conducted September 19 through October 7, 2006, at a trailer staging area located in Baton Rouge, Louisiana [4].

The objectives of the sampling project included the establishment of general baseline concentrations of formaldehyde and other VOCs in the 96 trailers involved in the study, in addition to the evaluation of the general effect of two separate and distinct ventilation practices used on these particular trailers. In Group A, ventilation was provided by running the air conditioning system; in Group B, ventilation was provided by opening windows and vents. The study involved a 14 day sampling period and was not intended to evaluate longer term formaldehyde levels or potential exposures for trailer residents.

The purpose of the ATSDR consultation is to provide FEMA a clearer understanding of the issues associated with formaldehyde in temporary housing units. The consultation is not intended to establish FEMA's future policy concerning temporary housing units. The conclusions derived from the sampling of the 96 trailers are for those trailers only, and are not necessarily applicable to all other trailers due to numerous variables for which appropriate data and information are not available.

II. Discussion:

Formaldehyde Background:

Formaldehyde (HCHO) is one of the 25 most abundantly produced chemicals in the world [1]. It is pervasive throughout our society and is found in numerous construction materials, home furnishings, and products used in the home. At room temperature, formaldehyde is a colorless, flammable gas. It may have a noticeable irritating odor to some people at very low concentrations, with an odor threshold of approximately 0.5 to 1.0 part per million (ppm) in air, which is equivalent to 615 to 1230 micrograms per cubic meter (ug/m3) in air [2,3].

Formaldehyde may be released into the air from many products used in the home. It is present in the adhesives used to make plywood and particle board. Cabinets and furniture used in the home are often made from these materials. Formaldehyde is also found in new permanent press fabrics, new carpets, latex paint, decorative laminates, and fiberglass products. Many products used everyday around the house also contain formaldehyde such as fingernail polish and hardeners, antiseptics, medicines, cosmetics, dish-washing liquids, fabric softeners, shoe-care agents, carpet cleaners, glues and adhesives, lacquers, and plastics. Some paper products such as grocery bags and paper towels also give off small amounts of formaldehyde. Some food products such as certain types of Italian cheeses, dried foods, and fish, contain formaldehyde as a preservative. In addition, formaldehyde is produced by cigarettes and other tobacco products, gas cookers, and open fireplaces [2].

The concentration of formaldehyde detected outdoors, in general, is usually less than that detected in indoor air. Background levels of formaldehyde detected in outdoor air from urban areas are dependent on local conditions and can vary widely. Concentrations generally range from 1 to 20 ug/m3 (0.0008 - 0.016 ppm) . The incomplete combustion of hydrocarbon fuels can contribute to the level of formaldehyde in outdoor air. Urban air concentrations during heavy traffic or severe inversions can range up to 100 ug/m3 (0.08 ppm) (IARC 1995) [3].

Factors which effect the concentration of formaldehyde in indoor air include the type and quantity of source materials, the age of the source materials, ventilation, temperature, and humidity. Some of the major sources of formaldehyde indoors have been the off-gassing of urea-formaldehyde foam insulation (UFFI) and particle board. The release of formaldehyde is expected to decrease from wood-based building materials as they age. (EPA 1996; Zinn et al. 1990) [2]. The concentration of formaldehyde in mobile homes would be expected to be higher than that found in conventional homes due to their lower rate of air exchange (Wolff 1991) [2]. The levels of formaldehyde appear to decrease as the mobile home and its formaldehyde-based resins age, with a half-life of 4 to 5 years (IARC, 1995) [3].

Several monitoring studies were conducted in the US during the 1980s to measure formaldehyde concentrations in indoor environments. Much of the data was collected in either older homes, in homes that had urea formaldehyde foam insulation (UFFI), or in homes in which occupants had filed complaints of formaldehyde irritant symptoms. Mobile homes with a complaint had formaldehyde concentrations ranging from 0.00 to 4.2 ppm (5166 ug/m3), (Gammage and Hawthorne 1985). Randomly selected mobile homes without a complaint had formaldehyde concentrations ranging from less than 0.01 to 2.9 ppm (12.3 – 3567 ug/m3), (EPA 1987). Conventional homes overall had a concentration of formaldehyde ranging from less than 0.02 to 0.4 ppm (24.6 – 492 ug/m3), (Hawthorne et al. 1985, 1986). Since the mid 1980s, plywood and particle board manufacturing methods have changed to reduce formaldehyde emissions. Home construction methods have also changed to reduce the use of UFFI. A study conducted on a newly constructed and unoccupied house, found average indoor concentrations of formaldehyde to be 0.035 to 0.45 ppm (43 – 553 ug/m3), approximately 30 days after formaldehyde releasing materials were installed (Hare et al. 1996) [2].

In a 1993 study, the ranges of formaldehyde concentrations in complaint homes, mobile homes, and homes containing large quantities of particle board or UFFI were 0.02 to 0.8 ppm (24.6 – 984 ug/m3), with levels as high as 4 ppm (4920 ug/m3), sufficient to cause irritating symptoms, observed in some instances. Formaldehyde concentrations in conventional homes less than one year old were within the range of 0.05 to 0.2 ppm (61.5 – 246 ug/m3), with few measurements exceeding 0.3 ppm (369 ug/m3). Older conventional homes had the lowest indoor concentrations of formaldehyde with values typically less than 0.05 ppm (61.5 ug/m3), (Gold et al. 1993) [2].

Formaldehyde Toxicity:

Exposure to formaldehyde can occur through several routes of exposure including inhalation, dermal contact, and ingestion. Most formaldehyde exposures occur by inhalation or by skin/eye contact. Most cases of acute exposure to formaldehyde will likely be detected by the sense of smell. At very low concentrations, formaldehyde may have a noticeable irritating odor with an odor threshold of approximately 0.5 to 1.0 ppm (615 – 1230 ug/m3), [2,3].

Formaldehyde can be irritating to many tissues when it comes into direct contact with them. The most common symptoms of formaldehyde exposure include the irritation of the eyes, nose, and throat; along with increased tearing, which occurs in air concentrations of about 0.4 to 3.0 ppm (492 – 3690 ug/m3), [2]. Other symptoms at low concentrations may include headache, runny nose, and difficulty breathing [1]. At higher concentrations, formaldehyde has a pungent, distinct odor and may cause a burning sensation to the eyes, nose, and lungs [2].

Some people are more sensitive to the effects of formaldehyde than others. In persons who have been previously sensitized, inhalation and skin contact may cause various skin disorders, asthma-like symptoms, anaphylactic reactions, and

rarely hemolysis. In persons who are not sensitized, prolonged inhalation of formaldehyde at low levels is unlikely to result in chronic pulmonary injury [1]. Formaldehyde liquid is considered to be a dermal sensitizer, but not the gaseous phase, nor formalin (aqueous solution usually 37% formaldehyde), (Hilton et al.1996) [2].

Persons who are sensitized to formaldehyde may experience headaches, and minor eye and airway irritation at levels below the odor threshold of 0.5 to 1.0 ppm (615 – 1230 ug/m3). Some sensitive individuals may experience asthma-like symptoms, and dermatitis, even at very low doses [1]. Previously sensitized individuals can develop severe narrowing of the bronchi at very low concentrations such as 0.3 ppm (369 ug/m3). Bronchial narrowing may begin immediately, or can be delayed for 3 to 4 hours. Effects may worsen for up to 20 hours after exposure and can persist for several days [1]. The Threshold Limit Value (TLV), Short–term Exposure Limit (STEL) recommended by the American Conference of Government Industrial Hygienists (ACGIH) is also 0.3 ppm (369 ug/m3) [6].

Populations of humans that have received considerable attention in the literature as being particularly sensitive to formaldehyde exposure following inhalation and/or dermal contact include asthmatics and persons with dermal sensitization. The concerns involving asthmatics focuses on the potential changes in lung function parameters that formaldehyde may produce. Studies involving asthmatics have been somewhat conflicting, but generally indicate that formaldehyde does not induce airway hyper-reactivity at concentrations less than 3 ppm (3690 ug/m3) [2]. Symptoms of increased itching, sneezing, mucosal congestion, and transient burning sensation of the eyes and the nasal passages, were observed in a group of potentially sensitive individuals, some with dermal hypersensitivity, exposed to formaldehyde at a concentration of 0.4 ppm (492 ug/m3) for a period of 2 hours (Pazdrak et al. 1993) [2].

Dermal allergic reactions have been reported in doctors and nurses exposed to formaldehyde (Rudzki et al. 1989) as well as in fiberglass worker (Kilburn et al. 1985). Anaphylactic reactions have been reported in the literature (Maurice et al. 1986), in a description of a case in which anaphylaxis occurred in a patient due to skin contact with adhesives sterilized with formaldehyde prior to hemodialysis therapy. Other persons with dermal sensitization to formaldehyde are not likely to develop signs of respiratory insufficiency [2].

Although formaldehyde is readily absorbed into the body, it is also very quickly broken down. It is not stored in fat. Formaldehyde is also naturally produced in small amounts in the human body as a part of normal, everyday metabolism. The normal blood level of formaldehyde in humans is approximately 2.5 ppm (2500 micrograms per liter (ug/L)). Formaldehyde has a half-life in blood of approximately 1.5 minutes (Sullivan, 1999) [3]. Almost every tissues of the body has the ability to break down formaldehyde. It is usually converted to a non-toxic

chemical called formate, which is excreted in the urine. In addition, formaldehyde can also be converted to carbon dioxide and breathed out of the body [2].

A level of concern for formaldehyde in trailers used for temporary housing would be 0.3 ppm (369 ug/m3), which is an effect level associated with the narrowing of the bronchi in sensitive individuals [1].

FEMA/EPA Sampling Plan:

During the FEMA/EPA temporary housing units sampling project an initial sampling event was conducted to establish baseline conditions for formaldehyde and VOC concentrations in indoor air. The initial sampling event was conducted in all trailers with doors and windows closed without ventilation. One 24-hour VOC sample and one 1-hour formaldehyde sample was collected in each trailer [4].

Upon completion of the initial sampling, the trailers were divided into two subsets: In one subset (Group A), the air conditioning system was set to cool (thermostat set at 72 degrees Fahrenheit and without targeted humidity control) and the bathroom static vents left open. No other ventilation was provided for the Group A trailers. In the second subset (Group B), ventilation was provided by opening all windows, static vents, and exhaust fan vents. Exhaust fans were not operated (turned on) [4].

Sampling for formaldehyde was conducted twice daily over a 14-day period while the Group A and Group B ventilation conditions were maintained. A total of 2284 formaldehyde samples were collected during the project. In addition, a final 24-hour sampling event for VOCs was conducted at the end of the 14-day period while the Group A and Group B ventilation conditions were maintained [4].

Sampling Results:

The outdoor background concentration of formaldehyde detected at the trailer staging area during the sampling project ranged from 1 to 87 ug/m3 with an average of approximately 6 ug/m3 [5]. The background level of formaldehyde detected was consistent with the levels detected in urban areas in other studies as previously stated.

From the data provided by FEMA, queries were conducted to determine the minimum, maximum, and average concentrations of formaldehyde detected each day for the two different ventilation methods (see attached data table). Ventilation in Group A trailers was provided by running the air conditioning system; while ventilation in Group B trailers was provided by opening the windows and vents. The average formaldehyde concentration per day for each method was plotted on a graph for comparison (see attached graph).

In Group A trailers, a total of 1090 samples were collected for formaldehyde throughout the entire sampling project. The concentrations of formaldehyde detected in all of the Group A trailers included a minimum of 3.4 ug/m3, a maximum of 3000 ug/m3, and an average of 490 ug/m3. In Group B trailers, a total of 1117 samples were also collected for formaldehyde. Formaldehyde concentrations in all of the Group B trailers included a minimum concentration of 3 ug/m3, a maximum of 4500 ug/m3, and an average of 172 ug/m3.

Several general trends can be observed from the attached graph, concerning the 96 trailers involved in the sampling project. The graph indicates the average formaldehyde concentration per day for each of the two ventilation methods plotted side by side for comparison. After the fourth day of sampling, the two methods showed a general decline in formaldehyde concentration in all trailers for the remainder of the 14-day study. The trailers in Group B, overall and in general, had a lower average concentrations of formaldehyde than the trailers in Group A. The average concentration of formaldehyde per day in all of Group B was below the level of concern of 369 ug/m3, after the fourth day of sampling and for the remainder of the study. In the trailers in Group A, the average concentration of formaldehyde per day was lower than the level of concern of 369 ug/m3 only on two days, 9/29 and 10/7.

In addition to formaldehyde, other volatile organic compounds (VOCs) were also analyzed. Most of the other (VOCs) detected were in the low ug/m3 range. VOCs in the higher ug/m3 range included styrene and tetrachloroethene at a maximum concentration of 790 ug/m3 and 490 ug/m3, respectively. The concentrations of these VOCs were at levels not expected to produce adverse health effects.

III. Conclusions:

In the 96 trailers sampled, the method of ventilation used in trailer group B, of opening all windows, static vents, and exhaust fan vents, was more effective at lowering the concentration of formaldehyde during the period of this sampling project than the method of ventilation used in trailer Group A of running the air conditioning system with the bathroom static vents open. The method of ventilation which allowed for the greatest number of air exchanges was the most effective in lowering the concentration of formaldehyde.

The average concentration of formaldehyde per day in Group B trailers, after the fourth day of sampling and for the remainder of the study, was below the level of concern for sensitive individuals of 369 ug/m3 (0.3 ppm). The average concentration of formaldehyde per day in Group A trailers was above the level of concern for sensitive individuals in all but two days of the study. Individuals previously sensitized to formaldehyde may experience symptoms above 369 ug/m3 (0.3 ppm). A combination of ventilation methods, in addition to Method A, may be necessary to reduce formaldehyde concentrations below levels of health concern for sensitive individuals.

The concentrations of the other VOCs detected during the sampling project were below levels expected to produce adverse health effects.

FEMA has not requested ATSDR to evaluate longer-term formaldehyde concentrations in trailers or health concerns related to potential exposures. ATSDR will be available to provide assistance if such data becomes available in the future.

IV. Recommendations:

Formaldehyde is given off as a gas from the manufactured wood products, including plywood and particle board, used in new mobile homes. The amount of formaldehyde released from these products decreases slowly over time. Formaldehyde levels in indoor air are usually higher than the levels outdoors. The amount of formaldehyde in mobile homes is usually higher than it is in conventional homes because of the lower air turnover. Opening windows or using a fan to bring in fresh air is the easiest way to lower formaldehyde levels in the home and reduce the risk of exposure [2].

Formaldehyde is found in small amounts in many consumer products including household cleaners, antiseptics, medicines, dish-washing liquids, fabric softeners, shoe-care agents, carpet cleaners, glues, adhesives, and lacquers. When using these products, providing fresh outdoor air will reduce exposure to formaldehyde. Some cosmetics, such as nail hardeners, have very high levels of formaldehyde. Not using these products in a small room, or providing plenty of ventilation when they are used will reduce the level of exposure to formaldehyde [2]

Removing formaldehyde sources from the house will also reduce the risk of exposure. Since formaldehyde is found in tobacco smoke, not smoking or smoking outside will reduce exposure to formaldehyde. Unvented heaters, such as portable kerosene heaters, also produce formaldehyde. Not using these heaters in a home will help to prevent the buildup of formaldehyde indoors [2].

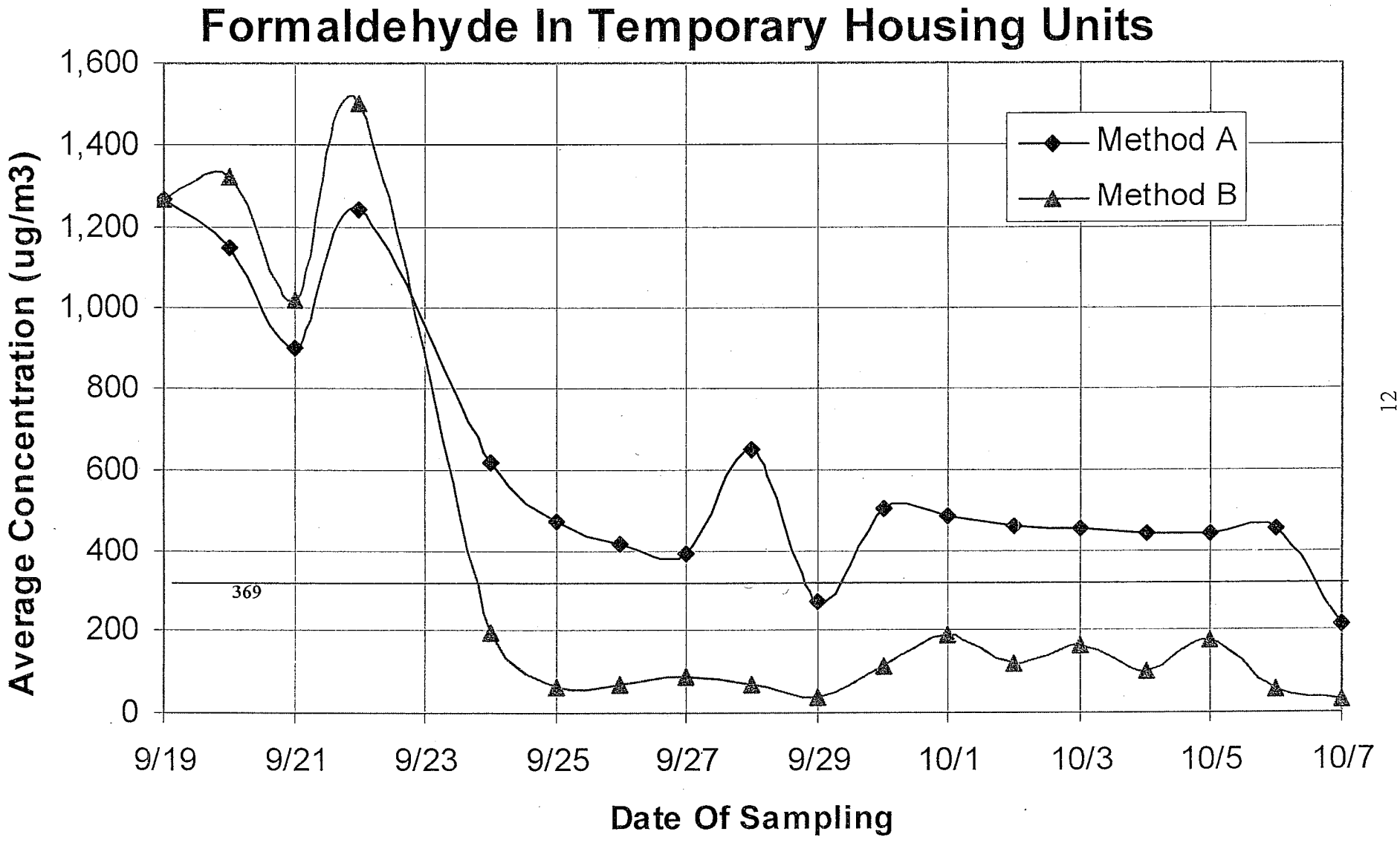
Some new permanent press fabrics also emit formaldehyde. Washing these new clothes before they are used will usually lower the amount of formaldehyde [2].

Increasing the ventilation to provide for the greatest number of air exchanges will be the most effective action in lowering the potential exposure to formaldehyde.

Prepared by:

Joseph D. Little, MSPH
CDR U.S. Public Health Service
Emergency Response Coordinator
Prevention Response and Medical Support Branch
Division of Toxicology and Environmental Medicine

Scott V. Wright, MS
Emergency Response Coordinator
Prevention Response and Medical Support Branch
Division of Toxicology and Environmental Medicine


Formaldehyde In Temporary Housing Units
Average Concentration (ug/m3)
1,600
1,400
1,200
1,000
800
600
400
369
200
0
9/19
9/21
9/23
9/25
9/27
9/29
10/1
10/3
10/5
10/7
Date Of Sampling
Method A
Method B

Formaldehyde in Temporary Housing Units

Analyte	Method	Date	Min	Ave	SDs	GM	GSD	Max	N
Formaldehyde	A	9/19/2006	5.3	1,264.98	842.62	629.2	6.41	2500	17
Formaldehyde	A	9/20/2006	6.6	1,145.12	680.63	740.82	4.5	2100	13
Formaldehyde	A	9/21/2006	5.2	901.69	808.84	352.25	7.56	2200	14
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Formaldehyde	A	10/1/2006	4.6	484.59	305.55	323.51	3.51	1200	53
Formaldehyde	A	10/2/2006	4.3	460.32	308.35	290.9	3.69	1200	61
Formaldehyde	A	10/3/2006	4.7	455.03	303.04	305.85	3.19	1200	60
Formaldehyde	A	10/4/2006	3.8	439.4	298.68	273.49	3.82	1300	55
Formaldehyde	A	10/5/2006	4	442.35	302.55	287	3.39	1200	59
Formaldehyde	A	10/6/2006	3.4	453.12	292.51	282.13	3.95	1300	60
Formaldehyde	A	10/7/2006	4.8	216.39	137.36	151.29	2.91	590	59
Formaldehyde	B	9/19/2006	5.9	1,263.29	758.39	845.02	4.07	2800	17
Formaldehyde	B	9/20/2006	4.3	1,322.25	969.85	509.78	9.39	2800	17
Formaldehyde	B	9/21/2006	190	1,018.57	644.38	784.36	2.26	1900	14
Formaldehyde	B	9/22/2006	4.6	1,496.07	1,353.82	585.53	8.16	4500	15
Formaldehyde	B	9/24/2006	3	196.6	138.31	138.92	2.8	600	117
Formaldehyde	B	9/25/2006	3.9	61.1	41.37	47.36	2.2	190	112
Formaldehyde	B	9/26/2006	3.4	66.45	40.35	52.24	2.24	180	114
Formaldehyde	B	9/27/2006	3.4	90.56	56.44	69.68	2.36	240	112
Formaldehyde	B	9/28/2006	4	72.34	42.96	57.34	2.2	180	59
Formaldehyde	B	9/29/2006	3.5	40.49	25.95	32.54	2.04	130	60
Formaldehyde	B	9/30/2006	4.9	115.49	72.12	88.75	2.37	300	60
Formaldehyde	B	10/1/2006	3.8	185.87	124.93	130.36	2.93	560	65
Formaldehyde	B	10/2/2006	3.9	120	77.48	90.09	2.51	340	56
Formaldehyde	B	10/3/2006	4.4	162.19	105.31	116.45	2.75	450	57
Formaldehyde	B	10/4/2006	4.1	102.76	77.13	72.14	2.58	330	62
Formaldehyde	B	10/5/2006	3.5	178.46	118.41	125.5	2.9	470	61
Formaldehyde	B	10/6/2006	3.4	53.62	39.54	37.69	2.61	180	60
Formaldehyde	B	10/7/2006	3.6	29.06	16.9	24.29	1.92	95	59

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3. National Library of Medicine, Hazardous Substances Data Bank (HSDB), Formaldehyde, 2006. http://toxnet.nlm.nih.gov.

4. U.S. Environmental Protection Agency, Formaldehyde Sampling at FEMA Temporary Housing Units, Task Specific Addendum to: Contingency Air Monitoring and Sampling Plan for C&D Burning or Grinding Sites, USEPA, September 23, 2006.

5. Federal Emergency Management Agency, Formaldehyde in FEMA Family Units Sampling Program, Baton Rouge, LA, Field Documentation, Data Files, and Analytical Data DVD. FEMA, November 13, 2006.

6. American Conference of Government Industrial Hygienists, Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices. Cincinnati, ACGIH, 2006.

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last revised 2/1/07 4:58 pm

Health Consultation

Formaldehyde Sampling at FEMA Temporary Housing Units

Baton Rouge, Louisiana

February 1, 2007

Agency for Toxic Substances and Disease Registry

Executive Summary:

The ATSDR Emergency Response program was requested by the Federal Emergency Management Agency (FEMA), Office of Chief Counsel to review and provide an evaluation of analytical data related to a project involving formaldehyde sampling at FEMA temporary housing units/trailers located in Baton Rouge, Louisiana.

The objectives of the sampling project included the establishment of general baseline concentrations of formaldehyde and other VOCs in the 96 trailers involved in the study, in addition to the evaluation of the effectiveness of two separate and distinct ventilation practices used on these particular trailers to reduce the concentrations below levels of health concern. In Group A, ventilation was provided by running the air conditioning system with the bathroom static vents open; in Group B, ventilation was provided by opening windows and vents. The study involved a 14 day sampling period and was not intended to evaluate longer term formaldehyde levels or potential exposures for trailer residents.

The purpose of the ATSDR consultation is to provide FEMA a clearer understanding of the issues associated with formaldehyde in temporary housing units. The consultation is not intended to establish FEMA's future policy concerning temporary housing units. The conclusions derived from the sampling of the 96 trailers are for those trailers only, and are not necessarily applicable to all other trailers due to numerous variables for which appropriate data and information are not available.

In the 96 trailers sampled, the method of ventilation used in trailer group B, of opening all windows, static vents, and exhaust fan vents, was more effective at lowering the concentration of formaldehyde during the period of this sampling project than the method of ventilation used in trailer Group A of running the air conditioning system with the bathroom static vents open. The method of ventilation which allowed for the greatest number of air exchanges was the most effective in lowering the concentration of formaldehyde.

The average concentration of formaldehyde per day in Group B trailers, after the fourth day of sampling and for the remainder of the study, was below the level of concern for sensitive individuals of 369 ug/m3 (0.3 ppm). The average concentration of formaldehyde per day in Group A trailers was above the level of concern for sensitive individuals in all but two days of the study. Individuals previously sensitized to formaldehyde may experience symptoms above 369 ug/m3 (0.3 ppm). A combination of ventilation methods, in addition to Method A, may be necessary to reduce formaldehyde concentrations below levels of health concern for sensitive individuals.

The concentrations of the other VOCs detected during the sampling project were below levels expected to produce adverse health effects.

FEMA has not requested ATSDR to evaluate longer-term formaldehyde concentrations in trailers or health concerns related to potential exposures. ATSDR will be available to provide assistance if such data becomes available in the future.

Formaldehyde Sampling at FEMA Temporary Housing Units
Baton Rouge, Louisiana

I. Background and Statement of Issues:

The ATSDR Emergency Response program was requested by the Federal Emergency Management Agency (FEMA), Office of Chief Counsel to review and provide an evaluation of analytical data related to a project involving formaldehyde sampling at FEMA temporary housing units located in Baton Rouge, Louisiana. The examples of temporary housing units used in the study are similar to those utilized by Hurricane Katrina displaced persons. The sampling project was being conducted by the U.S. Environmental Protection Agency (EPA), as requested by FEMA. ATSDR was requested to provide an evaluation of the data once the sampling project was completed by EPA. The initial request for ATSDR assistance with the data evaluation occurred on a conference call held on July 13, 2006. The sampling was completed by EPA on October 10, 2006. On December 6, 2006, the ATSDR Emergency Response program received a DVD from FEMA, OGC containing the analytical data for review.

FEMA had requested EPA to conduct a sampling and analytical program to evaluate formaldehyde and other volatile organic compounds (VOCs) in indoor air, inside FEMA selected and supplied temporary housing units or trailers. Air samples were collected and analyzed from new, unused trailers with and without the heating, ventilation and air conditioning (HVAC) systems operating. The indoor air samples were collected from a total of 96 new, unused trailers that were produced by eight separate manufacturers. A target of twelve trailers per manufacturer was identified by FEMA for analysis. The sampling was conducted September 19 through October 7, 2006, at a trailer staging area located in Baton Rouge, Louisiana [4].

The objectives of the sampling project included the establishment of general baseline concentrations of formaldehyde and other VOCs in the 96 trailers involved in the study, in addition to the evaluation of the general effect of two separate and distinct ventilation practices used on these particular trailers. In Group A, ventilation was provided by running the air conditioning system; in Group B, ventilation was provided by opening windows and vents. The study involved a 14 day sampling period and was not intended to evaluate longer term formaldehyde levels or potential exposures for trailer residents.

The purpose of the ATSDR consultation is to provide FEMA a clearer understanding of the issues associated with formaldehyde in temporary housing units. The consultation is not intended to establish FEMA's future policy concerning temporary housing units. The conclusions derived from the sampling of the 96 trailers are for those trailers only, and are not necessarily applicable to all other trailers due to numerous variables for which appropriate data and information are not available.

II. Discussion:

Formaldehyde Background:

Formaldehyde (HCHO) is one of the 25 most abundantly produced chemicals in the world [1]. It is pervasive throughout our society and is found in numerous construction materials, home furnishings, and products used in the home. At room temperature, formaldehyde is a colorless, flammable gas. It may have a noticeable irritating odor to some people at very low concentrations, with an odor threshold of approximately 0.5 to 1.0 part per million (ppm) in air, which is equivalent to 615 to 1230 micrograms per cubic meter (ug/m3) in air [2,3].

Formaldehyde may be released into the air from many products used in the home. It is present in the adhesives used to make plywood and particle board. Cabinets and furniture used in the home are often made from these materials. Formaldehyde is also found in new permanent press fabrics, new carpets, latex paint, decorative laminates, and fiberglass products. Many products used everyday around the house also contain formaldehyde such as fingernail polish and hardeners, antiseptics, medicines, cosmetics, dish-washing liquids, fabric softeners, shoe-care agents, carpet cleaners, glues and adhesives, lacquers, and plastics. Some paper products such as grocery bags and paper towels also give off small amounts of formaldehyde. Some food products such as certain types of Italian cheeses, dried foods, and fish, contain formaldehyde as a preservative. In addition, formaldehyde is produced by cigarettes and other tobacco products, gas cookers, and open fireplaces [2].

The concentration of formaldehyde detected outdoors, in general, is usually less than that detected in indoor air. Background levels of formaldehyde detected in outdoor air from urban areas are dependent on local conditions and can vary widely. Concentrations generally range from 1 to 20 ug/m3 (0.0008 - 0.016 ppm) . The incomplete combustion of hydrocarbon fuels can contribute to the level of formaldehyde in outdoor air. Urban air concentrations during heavy traffic or severe inversions can range up to 100 ug/m3 (0.08 ppm) (IARC 1995) [3].

Factors which effect the concentration of formaldehyde in indoor air include the type and quantity of source materials, the age of the source materials, ventilation, temperature, and humidity. Some of the major sources of formaldehyde indoors have been the off-gassing of urea-formaldehyde foam insulation (UFFI) and particle board. The release of formaldehyde is expected to decrease from wood-based building materials as they age. (EPA 1996; Zinn et al. 1990) [2]. The concentration of formaldehyde in mobile homes would be expected to be higher than that found in conventional homes due to their lower rate of air exchange (Wolff 1991) [2]. The levels of formaldehyde appear to decrease as the mobile home and its formaldehyde-based resins age, with a half-life of 4 to 5 years (IARC, 1995) [3].

Several monitoring studies were conducted in the US during the 1980s to measure formaldehyde concentrations in indoor environments. Much of the data was collected in either older homes, in homes that had urea formaldehyde foam insulation (UFFI), or in homes in which occupants had filed complaints of formaldehyde irritant symptoms. Mobile homes with a complaint had formaldehyde concentrations ranging from 0.00 to 4.2 ppm (5166 ug/m3), (Gammage and Hawthorne 1985). Randomly selected mobile homes without a complaint had formaldehyde concentrations ranging from less than 0.01 to 2.9 ppm (12.3 – 3567 ug/m3), (EPA 1987). Conventional homes overall had a concentration of formaldehyde ranging from less than 0.02 to 0.4 ppm (24.6 – 492 ug/m3), (Hawthorne et al. 1985, 1986). Since the mid 1980s, plywood and particle board manufacturing methods have changed to reduce formaldehyde emissions. Home construction methods have also changed to reduce the use of UFFI. A study conducted on a newly constructed and unoccupied house, found average indoor concentrations of formaldehyde to be 0.035 to 0.45 ppm (43 – 553 ug/m3), approximately 30 days after formaldehyde releasing materials were installed (Hare et al. 1996) [2].

In a 1993 study, the ranges of formaldehyde concentrations in complaint homes, mobile homes, and homes containing large quantities of particle board or UFFI were 0.02 to 0.8 ppm (24.6 – 984 ug/m3), with levels as high as 4 ppm (4920 ug/m3), sufficient to cause irritating symptoms, observed in some instances. Formaldehyde concentrations in conventional homes less than one year old were within the range of 0.05 to 0.2 ppm (61.5 – 246 ug/m3), with few measurements exceeding 0.3 ppm (369 ug/m3). Older conventional homes had the lowest indoor concentrations of formaldehyde with values typically less than 0.05 ppm (61.5 ug/m3), (Gold et al. 1993) [2].

Formaldehyde Toxicity:

Exposure to formaldehyde can occur through several routes of exposure including inhalation, dermal contact, and ingestion. Most formaldehyde exposures occur by inhalation or by skin/eye contact. Most cases of acute exposure to formaldehyde will likely be detected by the sense of smell. At very low concentrations, formaldehyde may have a noticeable irritating odor with an odor threshold of approximately 0.5 to 1.0 ppm (615 – 1230 ug/m3), [2,3].

Formaldehyde can be irritating to many tissues when it comes into direct contact with them. The most common symptoms of formaldehyde exposure include the irritation of the eyes, nose, and throat; along with increased tearing, which occurs in air concentrations of about 0.4 to 3.0 ppm (492 – 3690 ug/m3), [2]. Other symptoms at low concentrations may include headache, runny nose, and difficulty breathing [1]. At higher concentrations, formaldehyde has a pungent, distinct odor and may cause a burning sensation to the eyes, nose, and lungs [2].

Some people are more sensitive to the effects of formaldehyde than others. In persons who have been previously sensitized, inhalation and skin contact may cause various skin disorders, asthma-like symptoms, anaphylactic reactions, and

rarely hemolysis. In persons who are not sensitized, prolonged inhalation of formaldehyde at low levels is unlikely to result in chronic pulmonary injury [1]. Formaldehyde liquid is considered to be a dermal sensitizer, but not the gaseous phase, nor formalin (aqueous solution usually 37% formaldehyde), (Hilton et al.1996) [2].

Persons who are sensitized to formaldehyde may experience headaches, and minor eye and airway irritation at levels below the odor threshold of 0.5 to 1.0 ppm (615 – 1230 ug/m3). Some sensitive individuals may experience asthma-like symptoms, and dermatitis, even at very low doses [1]. Previously sensitized individuals can develop severe narrowing of the bronchi at very low concentrations such as 0.3 ppm (369 ug/m3). Bronchial narrowing may begin immediately, or can be delayed for 3 to 4 hours. Effects may worsen for up to 20 hours after exposure and can persist for several days [1]. The Threshold Limit Value (TLV), Short–term Exposure Limit (STEL) recommended by the American Conference of Government Industrial Hygienists (ACGIH) is also 0.3 ppm (369 ug/m3) [6].

Populations of humans that have received considerable attention in the literature as being particularly sensitive to formaldehyde exposure following inhalation and/or dermal contact include asthmatics and persons with dermal sensitization. The concerns involving asthmatics focuses on the potential changes in lung function parameters that formaldehyde may produce. Studies involving asthmatics have been somewhat conflicting, but generally indicate that formaldehyde does not induce airway hyper-reactivity at concentrations less than 3 ppm (3690 ug/m3) [2]. Symptoms of increased itching, sneezing, mucosal congestion, and transient burning sensation of the eyes and the nasal passages, were observed in a group of potentially sensitive individuals, some with dermal hypersensitivity, exposed to formaldehyde at a concentration of 0.4 ppm (492 ug/m3) for a period of 2 hours (Pazdrak et al. 1993) [2].

Dermal allergic reactions have been reported in doctors and nurses exposed to formaldehyde (Rudzki et al. 1989) as well as in fiberglass worker (Kilburn et al. 1985). Anaphylactic reactions have been reported in the literature (Maurice et al. 1986), in a description of a case in which anaphylaxis occurred in a patient due to skin contact with adhesives sterilized with formaldehyde prior to hemodialysis therapy. Other persons with dermal sensitization to formaldehyde are not likely to develop signs of respiratory insufficiency [2].

Although formaldehyde is readily absorbed into the body, it is also very quickly broken down. It is not stored in fat. Formaldehyde is also naturally produced in small amounts in the human body as a part of normal, everyday metabolism. The normal blood level of formaldehyde in humans is approximately 2.5 ppm (2500 micrograms per liter (ug/L)). Formaldehyde has a half-life in blood of approximately 1.5 minutes (Sullivan, 1999) [3]. Almost every tissues of the body has the ability to break down formaldehyde. It is usually converted to a non-toxic

chemical called formate, which is excreted in the urine. In addition, formaldehyde can also be converted to carbon dioxide and breathed out of the body [2].

A level of concern for formaldehyde in trailers used for temporary housing would be 0.3 ppm (369 ug/m3), which is an effect level associated with the narrowing of the bronchi in sensitive individuals [1].

FEMA/EPA Sampling Plan:

During the FEMA/EPA temporary housing units sampling project an initial sampling event was conducted to establish baseline conditions for formaldehyde and VOC concentrations in indoor air. The initial sampling event was conducted in all trailers with doors and windows closed without ventilation. One 24-hour VOC sample and one 1-hour formaldehyde sample was collected in each trailer [4].

Upon completion of the initial sampling, the trailers were divided into two subsets: In one subset (Group A), the air conditioning system was set to cool (thermostat set at 72 degrees Fahrenheit and without targeted humidity control) and the bathroom static vents left open. No other ventilation was provided for the Group A trailers. In the second subset (Group B), ventilation was provided by opening all windows, static vents, and exhaust fan vents. Exhaust fans were not operated (turned on) [4].

Sampling for formaldehyde was conducted twice daily over a 14-day period while the Group A and Group B ventilation conditions were maintained. A total of 2284 formaldehyde samples were collected during the project. In addition, a final 24-hour sampling event for VOCs was conducted at the end of the 14-day period while the Group A and Group B ventilation conditions were maintained [4].

Sampling Results:

The outdoor background concentration of formaldehyde detected at the trailer staging area during the sampling project ranged from 1 to 87 ug/m3 with an average of approximately 6 ug/m3 [5]. The background level of formaldehyde detected was consistent with the levels detected in urban areas in other studies as previously stated.

From the data provided by FEMA, queries were conducted to determine the minimum, maximum, and average concentrations of formaldehyde detected each day for the two different ventilation methods (see attached data table). Ventilation in Group A trailers was provided by running the air conditioning system; while ventilation in Group B trailers was provided by opening the windows and vents. The average formaldehyde concentration per day for each method was plotted on a graph for comparison (see attached graph).

In Group A trailers, a total of 1090 samples were collected for formaldehyde throughout the entire sampling project. The concentrations of formaldehyde detected in all of the Group A trailers included a minimum of 3.4 ug/m3, a maximum of 3000 ug/m3, and an average of 490 ug/m3. In Group B trailers, a total of 1117 samples were also collected for formaldehyde. Formaldehyde concentrations in all of the Group B trailers included a minimum concentration of 3 ug/m3, a maximum of 4500 ug/m3, and an average of 172 ug/m3.

Several general trends can be observed from the attached graph, concerning the 96 trailers involved in the sampling project. The graph indicates the average formaldehyde concentration per day for each of the two ventilation methods plotted side by side for comparison. After the fourth day of sampling, the two methods showed a general decline in formaldehyde concentration in all trailers for the remainder of the 14-day study. The trailers in Group B, overall and in general, had a lower average concentrations of formaldehyde than the trailers in Group A. The average concentration of formaldehyde per day in all of Group B was below the level of concern of 369 ug/m3, after the fourth day of sampling and for the remainder of the study. In the trailers in Group A, the average concentration of formaldehyde per day was lower than the level of concern of 369 ug/m3 only on two days, 9/29 and 10/7.

In addition to formaldehyde, other volatile organic compounds (VOCs) were also analyzed. Most of the other (VOCs) detected were in the low ug/m3 range. VOCs in the higher ug/m3 range included styrene and tetrachloroethene at a maximum concentration of 790 ug/m3 and 490 ug/m3, respectively. The concentrations of these VOCs were at levels not expected to produce adverse health effects.

III. Conclusions:

In the 96 trailers sampled, the method of ventilation used in trailer group B, of opening all windows, static vents, and exhaust fan vents, was more effective at lowering the concentration of formaldehyde during the period of this sampling project than the method of ventilation used in trailer Group A of running the air conditioning system with the bathroom static vents open. The method of ventilation which allowed for the greatest number of air exchanges was the most effective in lowering the concentration of formaldehyde.

The average concentration of formaldehyde per day in Group B trailers, after the fourth day of sampling and for the remainder of the study, was below the level of concern for sensitive individuals of 369 ug/m3 (0.3 ppm). The average concentration of formaldehyde per day in Group A trailers was above the level of concern for sensitive individuals in all but two days of the study. Individuals previously sensitized to formaldehyde may experience symptoms above 369 ug/m3 (0.3 ppm). A combination of ventilation methods, in addition to Method A, may be necessary to reduce formaldehyde concentrations below levels of health concern for sensitive individuals.

The concentrations of the other VOCs detected during the sampling project were below levels expected to produce adverse health effects.

FEMA has not requested ATSDR to evaluate longer-term formaldehyde concentrations in trailers or health concerns related to potential exposures. ATSDR will be available to provide assistance if such data becomes available in the future.

IV. Recommendations:

Formaldehyde is given off as a gas from the manufactured wood products, including plywood and particle board, used in new mobile homes. The amount of formaldehyde released from these products decreases slowly over time. Formaldehyde levels in indoor air are usually higher than the levels outdoors. The amount of formaldehyde in mobile homes is usually higher than it is in conventional homes because of the lower air turnover. Opening windows or using a fan to bring in fresh air is the easiest way to lower formaldehyde levels in the home and reduce the risk of exposure [2].

Formaldehyde is found in small amounts in many consumer products including household cleaners, antiseptics, medicines, dish-washing liquids, fabric softeners, shoe-care agents, carpet cleaners, glues, adhesives, and lacquers. When using these products, providing fresh outdoor air will reduce exposure to formaldehyde. Some cosmetics, such as nail hardeners, have very high levels of formaldehyde. Not using these products in a small room, or providing plenty of ventilation when they are used will reduce the level of exposure to formaldehyde [2]

Removing formaldehyde sources from the house will also reduce the risk of exposure. Since formaldehyde is found in tobacco smoke, not smoking or smoking outside will reduce exposure to formaldehyde. Unvented heaters, such as portable kerosene heaters, also produce formaldehyde. Not using these heaters in a home will help to prevent the buildup of formaldehyde indoors [2].

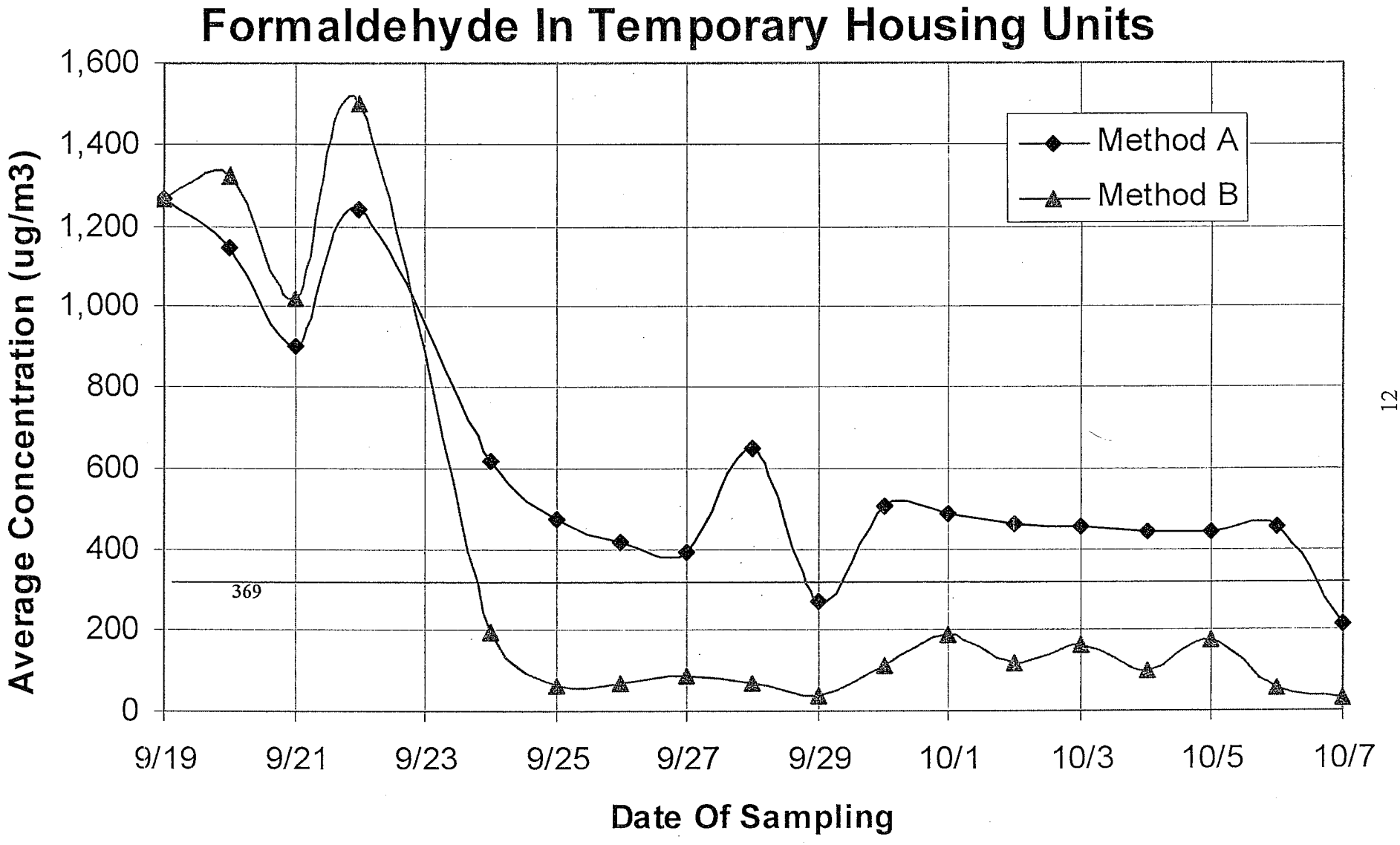
Some new permanent press fabrics also emit formaldehyde. Washing these new clothes before they are used will usually lower the amount of formaldehyde [2].

Increasing the ventilation to provide for the greatest number of air exchanges will be the most effective action in lowering the potential exposure to formaldehyde.

Prepared by:

Joseph D. Little, MSPH
CDR U.S. Public Health Service
Emergency Response Coordinator
Prevention Response and Medical Support Branch
Division of Toxicology and Environmental Medicine

Scott V. Wright, MS
Emergency Response Coordinator
Prevention Response and Medical Support Branch
Division of Toxicology and Environmental Medicine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Formaldehyde	A	9/30/2006	3.5	502.38	340.1	300.86	4.11	1400	57
Formaldehyde	A	10/1/2006	4.6	484.59	305.55	323.51	3.51	1200	53
Formaldehyde	A	10/2/2006	4.3	460.32	308.35	290.9	3.69	1200	61
Formaldehyde	A	10/3/2006	4.7	455.03	303.04	305.85	3.19	1200	60
Formaldehyde	A	10/4/2006	3.8	439.4	298.68	273.49	3.82	1300	55
Formaldehyde	A	10/5/2006	4	442.35	302.55	287	3.39	1200	59
Formaldehyde	A	10/6/2006	3.4	453.12	292.51	282.13	3.95	1300	60
Formaldehyde	A	10/7/2006	4.8	216.39	137.36	151.29	2.91	590	59
Formaldehyde	B	9/19/2006	5.9	1,263.29	758.39	845.02	4.07	2800	17
Formaldehyde	B	9/20/2006	4.3	1,322.25	969.85	509.78	9.39	2800	17
Formaldehyde	B	9/21/2006	190	1,018.57	644.38	784.36	2.26	1900	14
Formaldehyde	B	9/22/2006	4.6	1,496.07	1,353.82	585.53	8.16	4500	15
Formaldehyde	B	9/24/2006	3	196.6	138.31	138.92	2.8	600	117
Formaldehyde	B	9/25/2006	3.9	61.1	41.37	47.36	2.2	190	112
Formaldehyde	B	9/26/2006	3.4	66.45	40.35	52.24	2.24	180	114
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Formaldehyde	B	10/6/2006	3.4	53.62	39.54	37.69	2.61	180	60
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1. Agency for Toxic Substances and Disease Registry, Managing Hazardous Materials Incidents, Medical Management Guidelines for Acute Chemical Exposures, Formaldehyde. Atlanta, ATSDR, 2001.

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3. National Library of Medicine, Hazardous Substances Data Bank (HSDB), Formaldehyde, 2006. http://toxnet.nlm.nih.gov.

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Health Consultation

Formaldehyde Sampling at FEMA Temporary Housing Units

Baton Rouge, Louisiana

January 29, 2007

Agency for Toxic Substances and Disease Registry

Formaldehyde Sampling at FEMA Temporary Housing Units
Baton Rouge, Louisiana

Executive Summary:

The ATSDR Emergency Response program was requested by the Federal Emergency Management Agency (FEMA), Office of General Counsel (OGC) to review and provide an evaluation of analytical data related to a project involving formaldehyde sampling at FEMA temporary housing units located in Baton Rouge, Louisiana. The examples of temporary housing units used in the study are similar to those utilized by Hurricane Katrina displaced persons.

The objectives of the sampling project included the establishment of general baseline concentrations of formaldehyde and other VOCs in the 96 trailers involved in the study, in addition to the evaluation of the general effect of two separate and distinct ventilation practices used on these particular trailers. In Group A, ventilation was provided by running the air conditioning system; in Group B, ventilation was provided by opening windows and vents. The study involved a 14 day sampling period and was not intended to evaluate longer term formaldehyde levels.

The purpose of the ATSDR consultation is to provide FEMA a clearer understanding of the issues associated with formaldehyde in temporary housing units. The consultation is not intended to establish FEMA's future policy concerning temporary housing units. The conclusions derived from the sampling of the 96 trailers are for those trailers only, and are not necessarily applicable to all other trailers due to numerous uncontrollable variables

In the 96 trailers sampled, the method of ventilation used in trailer group B, of opening all windows, static vents, and exhaust fan vents, was more effective at lowering the concentration of formaldehyde during the period of this sampling project than the method of ventilation used in trailer Group A of running the air conditioning system with the bathroom static vents open. The method of ventilation which allowed for the greatest number of air exchanges was the most effective in lowering the concentration of formaldehyde.

The average concentration of formaldehyde per day in Group B trailers, after the fourth day of sampling and for the remainder of the study, was below the level of concern for sensitive individuals of 369 ug/m3 (0.3 ppm). The average concentration of formaldehyde per day in Group A trailers was above the level of concern for sensitive individuals in all but two days of the study. Individuals previously sensitized to formaldehyde may experience symptoms above 369 ug/m3 (0.3 ppm).

The concentrations of the other VOCs detected during the sampling project were below levels expected to produce adverse health effects.

Formaldehyde Sampling at FEMA Temporary Housing Units
Baton Rouge, Louisiana

I. Background and Statement of Issues:

The ATSDR Emergency Response program was requested by the Federal Emergency Management Agency (FEMA), Office of General Counsel (OGC) to review and provide an evaluation of analytical data related to a project involving formaldehyde sampling at FEMA temporary housing units located in Baton Rouge, Louisiana. The examples of temporary housing units used in the study are similar to those utilized by Hurricane Katrina displaced persons. The sampling project was being conducted by the U.S. Environmental Protection Agency (EPA), as requested by FEMA. ATSDR was requested to provide an evaluation of the data once the sampling project was completed by EPA. The initial request for ATSDR assistance with the data evaluation occurred on a conference call held on July 13, 2006. The sampling was completed by EPA on October 10, 2006. On December 6, 2006, the ATSDR Emergency Response program received a DVD from FEMA, OGC containing the analytical data for review.

FEMA had requested EPA to conduct a sampling and analytical program to evaluate formaldehyde and other volatile organic compounds (VOCs) in indoor air, inside FEMA selected and supplied temporary housing units or trailers. Air samples were collected and analyzed from new, unused trailers with and without the heating, ventilation and air conditioning (HVAC) systems operating. The indoor air samples were collected from a total of 96 new, unused trailers that were produced by eight separate manufacturers. A target of twelve trailers per manufacturer was identified by FEMA for analysis. The sampling was conducted September 19 through October 7, 2006, at a trailer staging area located in Baton Rouge, Louisiana [4].

The objectives of the sampling project included the establishment of general baseline concentrations of formaldehyde and other VOCs in the 96 trailers involved in the study, in addition to the evaluation of the general effect of two separate and distinct ventilation practices used on these particular trailers. In Group A, ventilation was provided by running the air conditioning system; in Group B, ventilation was provided by opening windows and vents. The study involved a 14 day sampling period and was not intended to evaluate longer term formaldehyde levels.

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II. Discussion:

Formaldehyde Background:

Formaldehyde (HCHO) is one of the 25 most abundantly produced chemicals in the world [1]. It is pervasive throughout our society and is found in numerous construction materials, home furnishings, and products used in the home. At room temperature, formaldehyde is a colorless, flammable gas. It may have a noticeable irritating odor to some people at very low concentrations, with an odor threshold of approximately 0.5 to 1.0 part per million (ppm) in air, which is equivalent to 615 to 1230 micrograms per cubic meter (ug/m3) in air [2,3].

Formaldehyde may be released into the air from many products used in the home. It is present in the adhesives used to make plywood and particle board. Cabinets and furniture used in the home are often made from these materials. Formaldehyde is also found in new permanent press fabrics, new carpets, latex paint, decorative laminates, and fiberglass products. Many products used everyday around the house also contain formaldehyde such as fingernail polish and hardeners, antiseptics, medicines, cosmetics, dish-washing liquids, fabric softeners, shoe-care agents, carpet cleaners, glues and adhesives, lacquers, and plastics. Some paper products such as grocery bags and paper towels also give off small amounts of formaldehyde. Some food products such as certain types of Italian cheeses, dried foods, and fish, contain formaldehyde as a preservative. In addition, formaldehyde is produced by cigarettes and other tobacco products, gas cookers, and open fireplaces [2].

The concentration of formaldehyde detected outdoors, in general, is usually less than that detected in indoor air. Background levels of formaldehyde detected in outdoor air from urban areas are dependent on local conditions and can vary widely. Concentrations generally range from 1 to 20 ug/m3 (0.0008 - 0.016 ppm) . The incomplete combustion of hydrocarbon fuels can contribute to the level of formaldehyde in outdoor air. Urban air concentrations during heavy traffic or severe inversions can range up to 100 ug/m3 (0.08 ppm) (IARC 1995) [3].

Factors which effect the concentration of formaldehyde in indoor air include the type and quantity of source materials, the age of the source materials, ventilation, temperature, and humidity. Some of the major sources of formaldehyde indoors have been the off-gassing of urea-formaldehyde foam insulation (UFFI) and particle board. The release of formaldehyde is expected to decrease from wood-based building materials as they age. (EPA 1996; Zinn et al. 1990) [2]. The concentration of formaldehyde in mobile homes would be expected to be higher than that found in conventional homes due to their lower rate of air exchange (Wolff 1991) [2]. The levels of formaldehyde appear to decrease as the mobile home and its formaldehyde-based resins age, with a half-life of 4 to 5 years (IARC, 1995) [3].

Several monitoring studies were conducted in the US during the 1980s to measure formaldehyde concentrations in indoor environments. Much of the data was collected in either older homes, in homes that had urea formaldehyde foam insulation (UFFI), or in homes in which occupants had filed complaints of formaldehyde irritant symptoms. Mobile homes with a complaint had formaldehyde concentrations ranging from 0.00 to 4.2 ppm (5166 ug/m3), (Gammage and Hawthorne 1985). Randomly selected mobile homes without a complaint had formaldehyde concentrations ranging from less than 0.01 to 2.9 ppm (12.3 – 3567 ug/m3), (EPA 1987). Conventional homes overall had a concentration of formaldehyde ranging from less than 0.02 to 0.4 ppm (24.6 – 492 ug/m3), (Hawthorne et al. 1985, 1986). Since the mid 1980s, plywood and particle board manufacturing methods have changed to reduce formaldehyde emissions. Home construction methods have also changed to reduce the use of UFFI. A study conducted on a newly constructed and unoccupied house, found average indoor concentrations of formaldehyde to be 0.035 to 0.45 ppm (43 – 553 ug/m3), approximately 30 days after formaldehyde releasing materials were installed (Hare et al. 1996) [2].

In a 1993 study, the ranges of formaldehyde concentrations in complaint homes, mobile homes, and homes containing large quantities of particle board or UFFI were 0.02 to 0.8 ppm (24.6 – 984 ug/m3), with levels as high as 4 ppm (4920 ug/m3), sufficient to cause irritating symptoms, observed in some instances. Formaldehyde concentrations in conventional homes less than one year old were within the range of 0.05 to 0.2 ppm (61.5 – 246 ug/m3), with few measurements exceeding 0.3 ppm (369 ug/m3). Older conventional homes had the lowest indoor concentrations of formaldehyde with values typically less than 0.05 ppm (61.5 ug/m3), (Gold et al. 1993) [2].

Formaldehyde Toxicity:

Exposure to formaldehyde can occur through several routes of exposure including inhalation, dermal contact, and ingestion. Most formaldehyde exposures occur by inhalation or by skin/eye contact. Most cases of acute exposure to formaldehyde will likely be detected by the sense of smell. At very low concentrations, formaldehyde may have a noticeable irritating odor with an odor threshold of approximately 0.5 to 1.0 ppm (615 – 1230 ug/m3), [2,3].

Formaldehyde can be irritating to many tissues when it comes into direct contact with them. The most common symptoms of formaldehyde exposure include the irritation of the eyes, nose, and throat; along with increased tearing, which occurs in air concentrations of about 0.4 to 3.0 ppm (492 – 3690 ug/m3), [2]. Other symptoms at low concentrations may include headache, runny nose, and difficulty breathing [1]. At higher concentrations, formaldehyde has a pungent, distinct odor and may cause a burning sensation to the eyes, nose, and lungs [2].

Some people are more sensitive to the effects of formaldehyde than others. In persons who have been previously sensitized, inhalation and skin contact may cause various skin disorders, asthma-like symptoms, anaphylactic reactions, and

rarely hemolysis. In persons who are not sensitized, prolonged inhalation of formaldehyde at low levels is unlikely to result in chronic pulmonary injury [1]. Formaldehyde liquid is considered to be a dermal sensitizer, but not the gaseous phase, nor formalin (aqueous solution usually 37% formaldehyde), (Hilton et al.1996) [2].

Persons who are sensitized to formaldehyde may experience headaches, and minor eye and airway irritation at levels below the odor threshold of 0.5 to 1.0 ppm (615 – 1230 ug/m3). Some sensitive individuals may experience asthma-like symptoms, and dermatitis, even at very low doses [1]. Previously sensitized individuals can develop severe narrowing of the bronchi at very low concentrations such as 0.3 ppm (369 ug/m3). Bronchial narrowing may begin immediately, or can be delayed for 3 to 4 hours. Effects may worsen for up to 20 hours after exposure and can persist for several days [1]. The Threshold Limit Value (TLV), Short–term Exposure Limit (STEL) recommended by the American Conference of Government Industrial Hygienists (ACGIH) is also 0.3 ppm (369 ug/m3) [6].

Populations of humans that have received considerable attention in the literature as being particularly sensitive to formaldehyde exposure following inhalation and/or dermal contact include asthmatics and persons with dermal sensitization. The concerns involving asthmatics focuses on the potential changes in lung function parameters that formaldehyde may produce. Studies involving asthmatics have been somewhat conflicting, but generally indicate that formaldehyde does not induce airway hyper-reactivity at concentrations less than 3 ppm (3690 ug/m3) [2]. Symptoms of increased itching, sneezing, mucosal congestion, and transient burning sensation of the eyes and the nasal passages, were observed in a group of potentially sensitive individuals, some with dermal hypersensitivity, exposed to formaldehyde at a concentration of 0.4 ppm (492 ug/m3) for a period of 2 hours (Pazdrak et al. 1993) [2].

Dermal allergic reactions have been reported in doctors and nurses exposed to formaldehyde (Rudzki et al. 1989) as well as in fiberglass worker (Kilburn et al. 1985). Anaphylactic reactions have been reported in the literature (Maurice et al. 1986), in a description of a case in which anaphylaxis occurred in a patient due to skin contact with adhesives sterilized with formaldehyde prior to hemodialysis therapy. Other persons with dermal sensitization to formaldehyde are not likely to develop signs of respiratory insufficiency [2].

Although formaldehyde is readily absorbed into the body, it is also very quickly broken down. It is not stored in fat. Formaldehyde is also naturally produced in small amounts in the human body as a part of normal, everyday metabolism. The normal blood level of formaldehyde in humans is approximately 2.5 ppm (2500 micrograms per liter (ug/L)). Formaldehyde has a half-life in blood of approximately 1.5 minutes (Sullivan, 1999) [3]. Almost every tissues of the body has the ability to break down formaldehyde. It is usually converted to a non-toxic

chemical called formate, which is excreted in the urine. In addition, formaldehyde can also be converted to carbon dioxide and breathed out of the body [2].

A level of concern for formaldehyde in trailers used for temporary housing would be 0.3 ppm (369 ug/m3), which is an effect level associated with the narrowing of the bronchi in sensitive individuals [1].

FEMA/EPA Sampling Plan:

During the FEMA/EPA temporary housing units sampling project an initial sampling event was conducted to establish baseline conditions for formaldehyde and VOC concentrations in indoor air. The initial sampling event was conducted in all trailers with doors and windows closed without ventilation. One 24-hour VOC sample and one 1-hour formaldehyde sample was collected in each trailer [4].

Upon completion of the initial sampling, the trailers were divided into two subsets: In one subset (Group A), the air conditioning system was set to cool (thermostat set at 72 degrees Fahrenheit and without targeted humidity control) and the bathroom static vents left open. No other ventilation was provided for the Group A trailers. In the second subset (Group B), ventilation was provided by opening all windows, static vents, and exhaust fan vents. Exhaust fans were not operated (turned on) [4].

Sampling for formaldehyde was conducted twice daily over a 14-day period while the Group A and Group B ventilation conditions were maintained. A total of 2284 formaldehyde samples were collected during the project. In addition, a final 24-hour sampling event for VOCs was conducted at the end of the 14-day period while the Group A and Group B ventilation conditions were maintained [4].

Sampling Results:

The outdoor background concentration of formaldehyde detected at the trailer staging area during the sampling project ranged from 1 to 87 ug/m3 with an average of approximately 6 ug/m3 [5]. The background level of formaldehyde detected was consistent with the levels detected in urban areas in other studies as previously stated.

From the data provided by FEMA, queries were conducted to determine the minimum, maximum, and average concentrations of formaldehyde detected each day for the two different ventilation methods (see attached data table). Ventilation in Group A trailers was provided by running the air conditioning system; while ventilation in Group B trailers was provided by opening the windows and vents. The average formaldehyde concentration per day for each method was plotted on a graph for comparison (see attached graph).

In Group A trailers, a total of 1090 samples were collected for formaldehyde throughout the entire sampling project. The concentrations of formaldehyde detected in all of the Group A trailers included a minimum of 3.4 ug/m3, a maximum of 3000 ug/m3, and an average of 490 ug/m3. In Group B trailers, a total of 1117 samples were also collected for formaldehyde. Formaldehyde concentrations in all of the Group B trailers included a minimum concentration of 3 ug/m3, a maximum of 4500 ug/m3, and an average of 172 ug/m3.

Several general trends can be observed from the attached graph, concerning the 96 trailers involved in the sampling project. The graph indicates the average formaldehyde concentration per day for each of the two ventilation methods plotted side by side for comparison. After the fourth day of sampling, the two methods showed a general decline in formaldehyde concentration in all trailers for the remainder of the 14-day study. The trailers in Group B, overall and in general, had a lower average concentrations of formaldehyde than the trailers in Group A. The average concentration of formaldehyde per day in all of Group B was below the level of concern of 369 ug/m3, after the fourth day of sampling and for the remainder of the study. In the trailers in Group A, the average concentration of formaldehyde per day was lower than the level of concern of 369 ug/m3 only on two days, 9/29 and 10/7.

In addition to formaldehyde, other volatile organic compounds (VOCs) were also analyzed. Most of the other (VOCs) detected were in the low ug/m3 range. VOCs in the higher ug/m3 range included styrene and tetrachloroethene at a maximum concentration of 790 ug/m3 and 490 ug/m3, respectively. The concentrations of these VOCs were at levels not expected to produce adverse health effects.

III. Conclusions:

In the 96 trailers sampled, the method of ventilation used in trailer group B, of opening all windows, static vents, and exhaust fan vents, was more effective at lowering the concentration of formaldehyde during the period of this sampling project than the method of ventilation used in trailer Group A of running the air conditioning system with the bathroom static vents open. The method of ventilation which allowed for the greatest number of air exchanges was the most effective in lowering the concentration of formaldehyde.

The average concentration of formaldehyde per day in Group B trailers, after the fourth day of sampling and for the remainder of the study, was below the level of concern for sensitive individuals of 369 ug/m3 (0.3 ppm). The average concentration of formaldehyde per day in Group A trailers was above the level of concern for sensitive individuals in all but two days of the study. Individuals previously sensitized to formaldehyde may experience symptoms above 369 ug/m3 (0.3 ppm).

The concentrations of the other VOCs detected during the sampling project were below levels expected to produce adverse health effects.

IV. Recommendations:

Formaldehyde is given off as a gas from the manufactured wood products, including plywood and particle board, used in new mobile homes. The amount of formaldehyde released from these products decreases slowly over time. Formaldehyde levels in indoor air are usually higher than the levels outdoors. The amount of formaldehyde in mobile homes is usually higher than it is in conventional homes because of the lower air turnover. Opening windows or using a fan to bring in fresh air is the easiest way to lower formaldehyde levels in the home and reduce the risk of exposure [2].

Formaldehyde is found in small amounts in many consumer products including household cleaners, antiseptics, medicines, dish-washing liquids, fabric softeners, shoe-care agents, carpet cleaners, glues, adhesives, and lacquers. When using these products, providing fresh outdoor air will reduce exposure to formaldehyde. Some cosmetics, such as nail hardeners, have very high levels of formaldehyde. Not using these products in a small room, or providing plenty of ventilation when they are used will reduce the level of exposure to formaldehyde [2]

Removing formaldehyde sources from the house will also reduce the risk of exposure. Since formaldehyde is found in tobacco smoke, not smoking or smoking outside will reduce exposure to formaldehyde. Unvented heaters, such as portable kerosene heaters, also produce formaldehyde. Not using these heaters in a home will help to prevent the buildup of formaldehyde indoors [2].

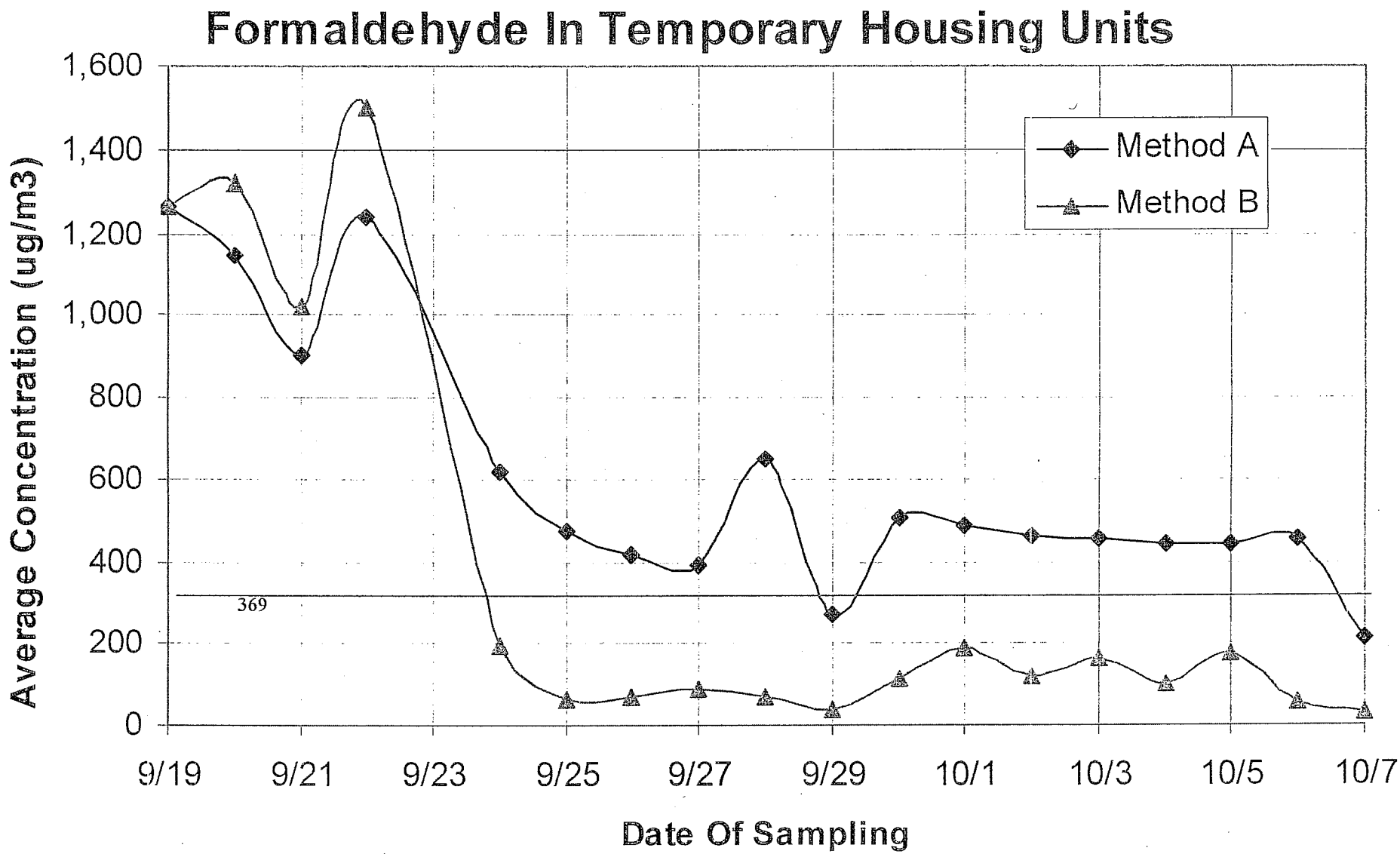
Some new permanent press fabrics also emit formaldehyde. Washing these new clothes before they are used will usually lower the amount of formaldehyde [2].

Increasing the ventilation to provide for the greatest number of air exchanges will be the most effective action in lowering the potential exposure to formaldehyde.

Prepared by:

Joseph D. Little, MSPH
CDR U.S. Public Health Service
Emergency Response Coordinator
Prevention Response and Medical Support Branch
Division of Toxicology and Environmental Medicine

Scott V. Wright, MS
Emergency Response Coordinator
Prevention Response and Medical Support Branch
Division of Toxicology and Environmental Medicine


Formaldehyde In Temporary Housing Units
Average Concentration (ug/m3)
1,600
1,400
1,200
1,000
800
600
400
200
0
369
Method A
Method B
9/19
9/21
9/23
9/25
9/27
9/29
10/1
10/3
10/5
10/7
Date Of Sampling

Formaldehyde in Temporary Housing Units

Analyte	Method	Date	Min	Ave	SDs	GM	GSD	Max	N
Formaldehyde	A	9/19/2006	5.3	1,264.98	842.62	629.2	6.41	2500	17
Formaldehyde	A	9/20/2006	6.6	1,145.12	680.63	740.82	4.5	2100	13
Formaldehyde	A	9/21/2006	5.2	901.69	808.84	352.25	7.56	2200	14
Formaldehyde	A	9/22/2006	4.6	1,240.08	913.94	530.62	8.23	3000	15
Formaldehyde	A	9/24/2006	3.4	619.28	442.71	339.85	4.8	2000	116
Formaldehyde	A	9/25/2006	3.9	473.75	348.04	295.34	3.63	1700	103
Formaldehyde	A	9/26/2006	4.6	418.41	314.28	258.26	3.62	1500	118
Formaldehyde	A	9/27/2006	3.4	390.05	301.96	239.74	3.53	1400	118
Formaldehyde	A	9/28/2006	4.3	649.4	440.62	426.74	3.44	1700	56
Formaldehyde	A	9/29/2006	3.6	268.04	187.82	172.03	3.44	800	56
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Formaldehyde Sampling at FEMA Temporary Housing Units
Baton Rouge, Louisiana

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The ATSDR Emergency Response program was requested by the Federal Emergency Management Agency (FEMA), Office of General Counsel (OGC) to review and provide an evaluation of analytical data related to a project involving formaldehyde sampling at FEMA temporary housing units located in Baton Rouge, Louisiana. The examples of temporary housing units used in the study are similar to those utilized by Hurricane Katrina displaced persons.

The objectives of the sampling project included the establishment of general baseline concentrations of formaldehyde and other VOCs in the 96 trailers involved in the study, in addition to the evaluation of the general effect of two separate and distinct ventilation practices used on these particular trailers. In Group A, ventilation was provided by running the air conditioning system; in Group B, ventilation was provided by opening windows and vents. The study involved a 14 day sampling period and was not intended to evaluate longer term formaldehyde levels.

The purpose of the ATSDR consultation is to provide FEMA a clearer understanding of the issues associated with formaldehyde in temporary housing units. The consultation is not intended to set guidelines for FEMA's future policy. The conclusions derived from the sampling of the 96 trailers are for those trailers only, and are not necessarily applicable to all other trailers due to numerous uncontrollable variables

In the 96 trailers sampled, the method of ventilation used in trailer group B, of opening all windows, static vents, and exhaust fan vents, was more effective at lowering the concentration of formaldehyde during the period of this sampling project than the method of ventilation used in trailer Group A of running the air conditioning system with the bathroom static vents open. The method of ventilation which allowed for the greatest number of air exchanges was the most effective in lowering the concentration of formaldehyde.

The average concentration of formaldehyde per day in Group B trailers, after the fourth day of sampling and for the remainder of the study, was below the level of concern for sensitive individuals of 369 ug/m3 (0.3 ppm). The average concentration of formaldehyde per day in Group A trailers was above the level of concern for sensitive individuals in all but two days of the study. Individuals previously sensitized to formaldehyde may experience symptoms above 369 ug/m3 (0.3 ppm).

The concentrations of the other VOCs detected during the sampling project were below levels expected to produce adverse health effects.

Increasing the ventilation to provide for the greatest number of air exchanges will be the most effective action in lowering the potential exposure to formaldehyde.

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Health Consultation

Formaldehyde Sampling at FEMA Temporary Housing Units

Baton Rouge, Louisiana

January 29, 2007

Agency for Toxic Substances and Disease Registry

Formaldehyde Sampling at FEMA Temporary Housing Units
Baton Rouge, Louisiana

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Formaldehyde Sampling at FEMA Temporary Housing Units
Baton Rouge, Louisiana

I. Background and Statement of Issues:

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FEMA had requested EPA to conduct a sampling and analytical program to evaluate formaldehyde and other volatile organic compounds (VOCs) in indoor air, inside FEMA selected and supplied temporary housing units or trailers. Air samples were collected and analyzed from new, unused trailers with and without the heating, ventilation and air conditioning (HVAC) systems operating. The indoor air samples were collected from a total of 96 new, unused trailers that were produced by eight separate manufacturers. A target of twelve trailers per manufacturer was identified by FEMA for analysis. The sampling was conducted September 19 through October 7, 2006, at a trailer staging area located in Baton Rouge, Louisiana [4].

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II. Discussion:

Formaldehyde Background:

Formaldehyde (HCHO) is one of the 25 most abundantly produced chemicals in the world [1]. It is pervasive throughout our society and is found in numerous construction

materials, home furnishings, and products used in the home. At room temperature, formaldehyde is a colorless, flammable gas. It may have a noticeable irritating odor to some people at very low concentrations, with an odor threshold of approximately 0.5 to 1.0 part per million (ppm) in air, which is equivalent to 615 to 1230 micrograms per cubic meter (ug/m3) in air [2,3].

Formaldehyde may be released into the air from many products used in the home. It is present in the adhesives used to make plywood and particle board. Cabinets and furniture used in the home are often made from these materials. Formaldehyde is also found in new permanent press fabrics, new carpets, latex paint, decorative laminates, and fiberglass products. Many products used everyday around the house also contain formaldehyde such as fingernail polish and hardeners, antiseptics, medicines, cosmetics, dish-washing liquids, fabric softeners, shoe-care agents, carpet cleaners, glues and adhesives, lacquers, and plastics. Some paper products such as grocery bags and paper towels also give off small amounts of formaldehyde. Some food products such as certain types of Italian cheeses, dried foods, and fish, contain formaldehyde as a preservative. In addition, formaldehyde is produced by cigarettes and other tobacco products, gas cookers, and open fireplaces [2].

The concentration of formaldehyde detected outdoors, in general, is usually less than that detected in indoor air. Background levels of formaldehyde detected in outdoor air from urban areas are dependent on local conditions and can vary widely. Concentrations generally range from 1 to 20 ug/m3 (0.0008 - 0.016 ppm) . The incomplete combustion of hydrocarbon fuels can contribute to the level of formaldehyde in outdoor air. Urban air concentrations during heavy traffic or severe inversions can range up to 100 ug/m3 (0.08 ppm) (IARC 1995) [3].

Factors which effect the concentration of formaldehyde in indoor air include the type and quantity of source materials, the age of the source materials, ventilation, temperature, and humidity. Some of the major sources of formaldehyde indoors have been the off-gassing of urea-formaldehyde foam insulation (UFFI) and particle board. The release of formaldehyde is expected to decrease from wood-based building materials as they age. (EPA 1996; Zinn et al. 1990) [2]. The concentration of formaldehyde in mobile homes would be expected to be higher than that found in conventional homes due to their lower rate of air exchange (Wolff 1991) [2]. The levels of formaldehyde appear to decrease as the mobile home and its formaldehyde-based resins age, with a half-life of 4 to 5 years (IARC, 1995) [3].

Several monitoring studies were conducted in the US during the 1980s to measure formaldehyde concentrations in indoor environments. Much of the data was collected in either older homes, in homes that had urea formaldehyde foam insulation (UFFI), or in homes in which occupants had filed complaints of formaldehyde irritant symptoms. Mobile homes with a complaint had formaldehyde concentrations ranging from 0.00 to 4.2 ppm (5166 ug/m3), (Gammage and Hawthorne 1985). Randomly selected mobile homes without a complaint had formaldehyde concentrations ranging from less than 0.01 to 2.9 ppm (12.3 – 3567 ug/m3), (EPA 1987). Conventional homes overall had a

concentration of formaldehyde ranging from less than 0.02 to 0.4 ppm (24.6 – 492 ug/m3), (Hawthorne et al. 1985, 1986). Since the mid 1980s, plywood and particle board manufacturing methods have changed to reduce formaldehyde emissions. Home construction methods have also changed to reduce the use of UFFI. A study conducted on a newly constructed and unoccupied house, found average indoor concentrations of formaldehyde to be 0.035 to 0.45 ppm (43 – 553 ug/m3), approximately 30 days after formaldehyde releasing materials were installed (Hare et al. 1996) [2].

In a 1993 study, the ranges of formaldehyde concentrations in complaint homes, mobile homes, and homes containing large quantities of particle board or UFFI were 0.02 to 0.8 ppm (24.6 – 984 ug/m3), with levels as high as 4 ppm (4920 ug/m3), sufficient to cause irritating symptoms, observed in some instances. Formaldehyde concentrations in conventional homes less than one year old were within the range of 0.05 to 0.2 ppm (61.5 – 246 ug/m3), with few measurements exceeding 0.3 ppm (369 ug/m3). Older conventional homes had the lowest indoor concentrations of formaldehyde with values typically less than 0.05 ppm (61.5 ug/m3), (Gold et al. 1993) [2].

Formaldehyde Toxicity:

Exposure to formaldehyde can occur through several routes of exposure including inhalation, dermal contact, and ingestion. Most formaldehyde exposures occur by inhalation or by skin/eye contact. Most cases of acute exposure to formaldehyde will likely be detected by the sense of smell. At very low concentrations, formaldehyde may have a noticeable irritating odor with an odor threshold of approximately 0.5 to 1.0 ppm (615 – 1230 ug/m3), [2,3].

Formaldehyde can be irritating to many tissues when it comes into direct contact with them. The most common symptoms of formaldehyde exposure include the irritation of the eyes, nose, and throat; along with increased tearing, which occurs in air concentrations of about 0.4 to 3.0 ppm (492 – 3690 ug/m3), [2]. Other symptoms at low concentrations may include headache, runny nose, and difficulty breathing [1]. At higher concentrations, formaldehyde has a pungent, distinct odor and may cause a burning sensation to the eyes, nose, and lungs [2].

Some people are more sensitive to the effects of formaldehyde than others. In persons who have been previously sensitized, inhalation and skin contact may cause various skin disorders, asthma-like symptoms, anaphylactic reactions, and rarely hemolysis. In persons who are not sensitized, prolonged inhalation of formaldehyde at low levels is unlikely to result in chronic pulmonary injury [1]. Formaldehyde liquid is considered to be a dermal sensitizer, but not the gaseous phase, nor formalin (aqueous solution usually 37% formaldehyde), (Hilton et al.1996) [2].

Persons who are sensitized to formaldehyde may experience headaches, and minor eye and airway irritation at levels below the odor threshold of 0.5 to 1.0

ppm (615 – 1230 ug/m3). Some sensitive individuals may experience asthma-like symptoms, and dermatitis, even at very low doses [1]. Previously sensitized individuals can develop severe narrowing of the bronchi at very low concentrations such as 0.3 ppm (369 ug/m3). Bronchial narrowing may begin immediately, or can be delayed for 3 to 4 hours. Effects may worsen for up to 20 hours after exposure and can persist for several days [1]. The Threshold Limit Value (TLV), Short–term Exposure Limit (STEL) recommended by the American Conference of Government Industrial Hygienists (ACGIH) is also 0.3 ppm (369 ug/m3) [6].

Populations of humans that have received considerable attention in the literature as being particularly sensitive to formaldehyde exposure following inhalation and/or dermal contact include asthmatics and persons with dermal sensitization. The concerns involving asthmatics focuses on the potential changes in lung function parameters that formaldehyde may produce. Studies involving asthmatics have been somewhat conflicting, but generally indicate that formaldehyde does not induce airway hyper-reactivity at concentrations less than 3 ppm (3690 ug/m3) [2]. Symptoms of increased itching, sneezing, mucosal congestion, and transient burning sensation of the eyes and the nasal passages, were observed in a group of potentially sensitive individuals, some with dermal hypersensitivity, exposed to formaldehyde at a concentration of 0.4 ppm (492 ug/m3) for a period of 2 hours (Pazdrak et al. 1993) [2].

Dermal allergic reactions have been reported in doctors and nurses exposed to formaldehyde (Rudzki et al. 1989) as well as in fiberglass worker (Kilburn et al. 1985). Anaphylactic reactions have been reported in the literature (Maurice et al. 1986), in a description of a case in which anaphylaxis occurred in a patient due to skin contact with adhesives sterilized with formaldehyde prior to hemodialysis therapy. Other persons with dermal sensitization to formaldehyde are not likely to develop signs of respiratory insufficiency [2].

Although formaldehyde is readily absorbed into the body, it is also very quickly broken down. It is not stored in fat. Formaldehyde is also naturally produced in small amounts in the human body as a part of normal, everyday metabolism. The normal blood level of formaldehyde in humans is approximately 2.5 ppm (2500 micrograms per liter (ug/L)). Formaldehyde has a half-life in blood of approximately 1.5 minutes (Sullivan, 1999) [3]. Almost every tissues of the body has the ability to break down formaldehyde. It is usually converted to a non-toxic chemical called formate, which is excreted in the urine. In addition, formaldehyde can also be converted to carbon dioxide and breathed out of the body [2].

A level of concern for formaldehyde in trailers used for temporary housing would be 0.3 ppm (369 ug/m3), which is an effect level associated with the narrowing of the bronchi in sensitive individuals [1].

FEMA/EPA Sampling Plan:

During the FEMA/EPA temporary housing units sampling project an initial sampling event was conducted to establish baseline conditions for formaldehyde and VOC concentrations in indoor air. The initial sampling event was conducted in all trailers with doors and windows closed without ventilation. One 24-hour VOC sample and one 1-hour formaldehyde sample was collected in each trailer [4].

Upon completion of the initial sampling, the trailers were divided into two subsets: In one subset (Group A), the air conditioning system was set to cool (thermostat set at 72 degrees Fahrenheit and without targeted humidity control) and the bathroom static vents left open. No other ventilation was provided for the Group A trailers. In the second subset (Group B), ventilation was provided by opening all windows, static vents, and exhaust fan vents. Exhaust fans were not operated (turned on) [4].

Sampling for formaldehyde was conducted twice daily over a 14-day period while the Group A and Group B ventilation conditions were maintained. A total of 2284 formaldehyde samples were collected during the project. In addition, a final 24-hour sampling event for VOCs was conducted at the end of the 14-day period while the Group A and Group B ventilation conditions were maintained [4].

Sampling Results:

The outdoor background concentration of formaldehyde detected at the trailer staging area during the sampling project ranged from 1 to 87 ug/m3 with an average of approximately 6 ug/m3 [5]. The background level of formaldehyde detected was consistent with the levels detected in urban areas in other studies as previously stated.

From the data provided by FEMA, queries were conducted to determine the minimum, maximum, and average concentrations of formaldehyde detected each day for the two different ventilation methods (see attached data table). Ventilation in Group A trailers was provided by running the air conditioning system; while ventilation in Group B trailers was provided by opening the windows and vents. The average formaldehyde concentration per day for each method was plotted on a graph for comparison (see attached graph).

In Group A trailers, a total of 1090 samples were collected for formaldehyde throughout the entire sampling project. The concentrations of formaldehyde detected in all of the Group A trailers included a minimum of 3.4 ug/m3, a maximum of 3000 ug/m3, and an average of 490 ug/m3. In Group B trailers, a total of 1117 samples were also collected for formaldehyde. Formaldehyde concentrations in all of the Group B trailers included a

minimum concentration of 3 ug/m3, a maximum of 4500 ug/m3, and an average of 172 ug/m3.

Several general trends can be observed from the attached graph, concerning the 96 trailers involved in the sampling project. The graph indicates the average formaldehyde concentration per day for each of the two ventilation methods plotted side by side for comparison. After the fourth day of sampling, the two methods showed a general decline in formaldehyde concentration in all trailers for the remainder of the 14-day study. The trailers in Group B, overall and in general, had a lower average concentrations of formaldehyde than the trailers in Group A. The average concentration of formaldehyde per day in all of Group B was below the level of concern of 369 ug/m3, after the fourth day of sampling and for the remainder of the study. In the trailers in Group A, the average concentration of formaldehyde per day was lower than the level of concern of 369 ug/m3 only on two days, 9/29 and 10/7.

In addition to formaldehyde, other volatile organic compounds (VOCs) were also analyzed. Most of the other (VOCs) detected were in the low ug/m3 range. VOCs in the higher ug/m3 range included styrene and tetrachloroethene at a maximum concentration of 790 ug/m3 and 490 ug/m3, respectively. The concentrations of these VOCs were at levels not expected to produce adverse health effects.

III. Conclusions:

The method of ventilation which allows for the greatest number of air exchanges will be the most effective in lowering the concentration of formaldehyde. The method of ventilation used in trailer group B, of opening all windows, static vents, and exhaust fan vents, was more effective at lowering the concentration of formaldehyde during the period of this sampling project than the method of ventilation used in trailer Group A of running the air conditioning system with the bathroom static vents open.

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The concentrations of the other VOCs detected during the sampling project were below levels expected to produce adverse health effects.

IV. Recommendations:

Formaldehyde is given off as a gas from the manufactured wood products, including plywood and particle board, used in new mobile homes. The amount of formaldehyde released from these products decreases slowly over time. Formaldehyde levels in indoor air are usually higher than the levels outdoors. The amount of formaldehyde in mobile homes is usually higher than it is in conventional homes because of the lower air turnover. Opening windows or using a fan to bring in fresh air is the easiest way to lower formaldehyde levels in the home and reduce the risk of exposure [2].

Formaldehyde is found in small amounts in many consumer products including household cleaners, antiseptics, medicines, dish-washing liquids, fabric softeners, shoe-care agents, carpet cleaners, glues, adhesives, and lacquers. When using these products, providing fresh outdoor air will reduce exposure to formaldehyde. Some cosmetics, such as nail hardeners, have very high levels of formaldehyde. Not using these products in a small room, or providing plenty of ventilation when they are used will reduce the level of exposure to formaldehyde [2]

Removing formaldehyde sources from the house will also reduce the risk of exposure. Since formaldehyde is found in tobacco smoke, not smoking or smoking outside will reduce exposure to formaldehyde. Unvented heaters, such as portable kerosene heaters, also produce formaldehyde. Not using these heaters in a home will help to prevent the buildup of formaldehyde indoors [2].

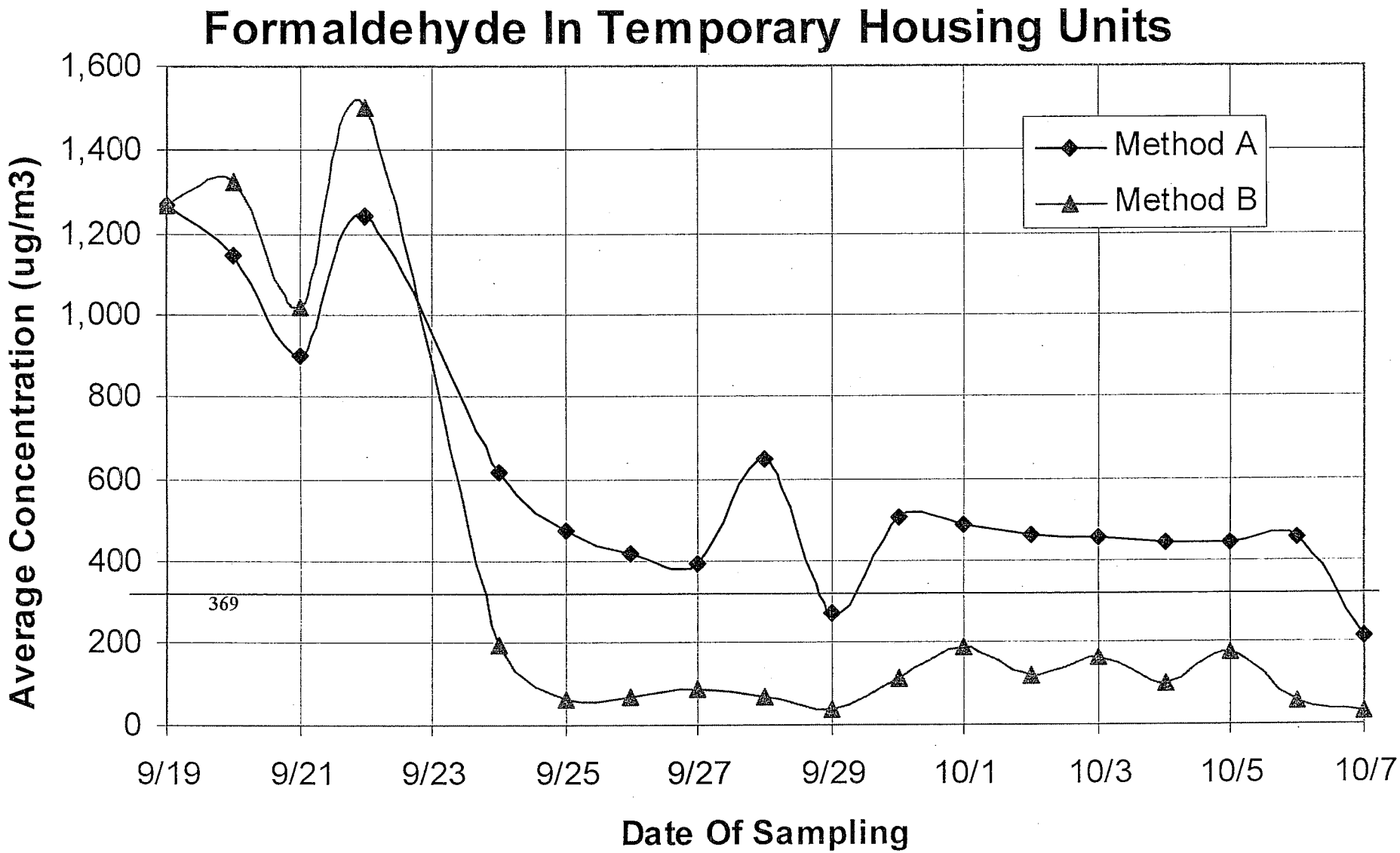
Some new permanent press fabrics also emit formaldehyde. Washing these new clothes before they are used will usually lower the amount of formaldehyde [2].

Increasing the ventilation to provide for the greatest number of air exchanges will be the most effective action in lowering the potential exposure to formaldehyde.

Prepared by:

Joseph D. Little, MSPH
CDR U.S. Public Health Service
Emergency Response Coordinator
Prevention Response and Medical Support Branch
Division of Toxicology and Environmental Medicine

Scott V. Wright, MS
Emergency Response Coordinator
Prevention Response and Medical Support Branch
Division of Toxicology and Environmental Medicine


Formaldehyde In Temporary Housing Units
Average Concentration (ug/m3)
1,600
1,400
1,200
1,000
800
600
400
369
200
0
9/19
9/21
9/23
9/25
9/27
9/29
10/1
10/3
10/5
10/7
Date Of Sampling
Method A
Method B

Formaldehyde in Temporary Housing Units

Analyte	Method	Date	Min	Ave	SDs	GM	GSD	Max	N
Formaldehyde	A	9/19/2006	5.3	1,264.98	842.62	629.2	6.41	2500	17
Formaldehyde	A	9/20/2006	6.6	1,145.12	680.63	740.82	4.5	2100	13
Formaldehyde	A	9/21/2006	5.2	901.69	808.84	352.25	7.56	2200	14
Formaldehyde	A	9/22/2006	4.6	1,240.08	913.94	530.62	8.23	3000	15
Formaldehyde	A	9/24/2006	3.4	619.28	442.71	339.85	4.8	2000	116
Formaldehyde	A	9/25/2006	3.9	473.75	348.04	295.34	3.63	1700	103
Formaldehyde	A	9/26/2006	4.6	418.41	314.28	258.26	3.62	1500	118
Formaldehyde	A	9/27/2006	3.4	390.05	301.96	239.74	3.53	1400	118
Formaldehyde	A	9/28/2006	4.3	649.4	440.62	426.74	3.44	1700	56
Formaldehyde	A	9/29/2006	3.6	268.04	187.82	172.03	3.44	800	56
Formaldehyde	A	9/30/2006	3.5	502.38	340.1	300.86	4.11	1400	57
Formaldehyde	A	10/1/2006	4.6	484.59	305.55	323.51	3.51	1200	53
Formaldehyde	A	10/2/2006	4.3	460.32	308.35	290.9	3.69	1200	61
Formaldehyde	A	10/3/2006	4.7	455.03	303.04	305.85	3.19	1200	60
Formaldehyde	A	10/4/2006	3.8	439.4	298.68	273.49	3.82	1300	55
Formaldehyde	A	10/5/2006	4	442.35	302.55	287	3.39	1200	59
Formaldehyde	A	10/6/2006	3.4	453.12	292.51	282.13	3.95	1300	60
Formaldehyde	A	10/7/2006	4.8	216.39	137.36	151.29	2.91	590	59
Formaldehyde	B	9/19/2006	5.9	1,263.29	758.39	845.02	4.07	2800	17
Formaldehyde	B	9/20/2006	4.3	1,322.25	969.85	509.78	9.39	2800	17
Formaldehyde	B	9/21/2006	190	1,018.57	644.38	784.36	2.26	1900	14
Formaldehyde	B	9/22/2006	4.6	1,496.07	1,353.82	585.53	8.16	4500	15
Formaldehyde	B	9/24/2006	3	196.6	138.31	138.92	2.8	600	117
Formaldehyde	B	9/25/2006	3.9	61.1	41.37	47.36	2.2	190	112
Formaldehyde	B	9/26/2006	3.4	66.45	40.35	52.24	2.24	180	114
Formaldehyde	B	9/27/2006	3.4	90.56	56.44	69.68	2.36	240	112
Formaldehyde	B	9/28/2006	4	72.34	42.96	57.34	2.2	180	59
Formaldehyde	B	9/29/2006	3.5	40.49	25.95	32.54	2.04	130	60
Formaldehyde	B	9/30/2006	4.9	115.49	72.12	88.75	2.37	300	60
Formaldehyde	B	10/1/2006	3.8	185.87	124.93	130.36	2.93	560	65
Formaldehyde	B	10/2/2006	3.9	120	77.48	90.09	2.51	340	56
Formaldehyde	B	10/3/2006	4.4	162.19	105.31	116.45	2.75	450	57
Formaldehyde	B	10/4/2006	4.1	102.76	77.13	72.14	2.58	330	62
Formaldehyde	B	10/5/2006	3.5	178.46	118.41	125.5	2.9	470	61
Formaldehyde	B	10/6/2006	3.4	53.62	39.54	37.69	2.61	180	60
Formaldehyde	B	10/7/2006	3.6	29.06	16.9	24.29	1.92	95	59

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Health Consultation

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Baton Rouge, Louisiana

January 19, 2007

Agency for Toxic Substances and Disease Registry

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The method of ventilation which allows for the greatest number of air exchanges will be the most effective in lowering the concentration of formaldehyde. The method of ventilation used in trailer group B, of opening all windows, static vents, and exhaust fan vents, was more effective at lowering the concentration of formaldehyde during the period of this sampling project than the method of ventilation used in trailer Group A of running the air conditioning system with the bathroom static vents open.

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Formaldehyde (HCHO) is one of the 25 most abundantly produced chemicals in the world [1]. It is pervasive throughout our society and is found in numerous construction

materials, home furnishings, and products used in the home. At room temperature, formaldehyde is a colorless, flammable gas. It may have a noticeable irritating odor to some people at very low concentrations, with an odor threshold of approximately 0.5 to 1.0 part per million (ppm) in air, which is equivalent to 615 to 1230 micrograms per cubic meter (ug/m3) in air [2,3].

Formaldehyde may be released into the air from many products used in the home. It is present in the adhesives used to make plywood and particle board. Cabinets and furniture used in the home are often made from these materials. Formaldehyde is also found in new permanent press fabrics, new carpets, latex paint, decorative laminates, and fiberglass products. Many products used everyday around the house also contain formaldehyde such as fingernail polish and hardeners, antiseptics, medicines, cosmetics, dish-washing liquids, fabric softeners, shoe-care agents, carpet cleaners, glues and adhesives, lacquers, and plastics. Some paper products such as grocery bags and paper towels also give off small amounts of formaldehyde. Some food products such as certain types of Italian cheeses, dried foods, and fish, contain formaldehyde as a preservative. In addition, formaldehyde is produced by cigarettes and other tobacco products, gas cookers, and open fireplaces [2].

The concentration of formaldehyde detected outdoors, in general, is usually less than that detected in indoor air. Background levels of formaldehyde detected in outdoor air from urban areas are dependent on local conditions and can vary widely. Concentrations generally range from 1 to 20 ug/m3 (0.0008 - 0.016 ppm) . The incomplete combustion of hydrocarbon fuels can contribute to the level of formaldehyde in outdoor air. Urban air concentrations during heavy traffic or severe inversions can range up to 100 ug/m3 (0.08 ppm) (IARC 1995) [3].

Factors which effect the concentration of formaldehyde in indoor air include the type and quantity of source materials, the age of the source materials, ventilation, temperature, and humidity. Some of the major sources of formaldehyde indoors have been the off-gassing of urea-formaldehyde foam insulation (UFFI) and particle board. The release of formaldehyde is expected to decrease from wood-based building materials as they age. (EPA 1996; Zinn et al. 1990) [2]. The concentration of formaldehyde in mobile homes would be expected to be higher than that found in conventional homes due to their lower rate of air exchange (Wolff 1991) [2]. The levels of formaldehyde appear to decrease as the mobile home and its formaldehyde-based resins age, with a half-life of 4 to 5 years (IARC, 1995) [3].

Several monitoring studies were conducted in the US during the 1980s to measure formaldehyde concentrations in indoor environments. Much of the data was collected in either older homes, in homes that had urea formaldehyde foam insulation (UFFI), or in homes in which occupants had filed complaints of formaldehyde irritant symptoms. Mobile homes with a complaint had formaldehyde concentrations ranging from 0.00 to 4.2 ppm (5166 ug/m3), (Gammage and Hawthorne 1985). Randomly selected mobile homes without a complaint had formaldehyde concentrations ranging from less than 0.01 to 2.9 ppm (12.3 – 3567 ug/m3), (EPA 1987). Conventional homes overall had a

concentration of formaldehyde ranging from less than 0.02 to 0.4 ppm (24.6 – 492 ug/m3), (Hawthorne et al. 1985, 1986). Since the mid 1980s, plywood and particle board manufacturing methods have changed to reduce formaldehyde emissions. Home construction methods have also changed to reduce the use of UFFI. A study conducted on a newly constructed and unoccupied house, found average indoor concentrations of formaldehyde to be 0.035 to 0.45 ppm (43 – 553 ug/m3), approximately 30 days after formaldehyde releasing materials were installed (Hare et al. 1996) [2].

In a 1993 study, the ranges of formaldehyde concentrations in complaint homes, mobile homes, and homes containing large quantities of particle board or UFFI were 0.02 to 0.8 ppm (24.6 – 984 ug/m3), with levels as high as 4 ppm (4920 ug/m3), sufficient to cause irritating symptoms, observed in some instances. Formaldehyde concentrations in conventional homes less than one year old were within the range of 0.05 to 0.2 ppm (61.5 – 246 ug/m3), with few measurements exceeding 0.3 ppm (369 ug/m3). Older conventional homes had the lowest indoor concentrations of formaldehyde with values typically less than 0.05 ppm (61.5 ug/m3), (Gold et al. 1993) [2].

Formaldehyde Toxicity:

Exposure to formaldehyde can occur through several routes of exposure including inhalation, dermal contact, and ingestion. Most formaldehyde exposures occur by inhalation or by skin/eye contact. Most cases of acute exposure to formaldehyde will likely be detected by the sense of smell. At very low concentrations, formaldehyde may have a noticeable irritating odor with an odor threshold of approximately 0.5 to 1.0 ppm (615 – 1230 ug/m3), [2,3].

Formaldehyde can be irritating to many tissues when it comes into direct contact with them. The most common symptoms of formaldehyde exposure include the irritation of the eyes, nose, and throat; along with increased tearing, which occurs in air concentrations of about 0.4 to 3.0 ppm (492 – 3690 ug/m3), [2]. Other symptoms at low concentrations may include headache, runny nose, and difficulty breathing [1]. At higher concentrations, formaldehyde has a pungent, distinct odor and may cause a burning sensation to the eyes, nose, and lungs [2].

Some people are more sensitive to the effects of formaldehyde than others. In persons who have been previously sensitized, inhalation and skin contact may cause various skin disorders, asthma-like symptoms, anaphylactic reactions, and rarely hemolysis. In persons who are not sensitized, prolonged inhalation of formaldehyde at low levels is unlikely to result in chronic pulmonary injury [1]. Formaldehyde liquid is considered to be a dermal sensitizer, but not the gaseous phase, nor formalin (aqueous solution usually 37% formaldehyde), (Hilton et al.1996) [2].

Persons who are sensitized to formaldehyde may experience headaches, and minor eye and airway irritation at levels below the odor threshold of 0.5 to 1.0

ppm (615 – 1230 ug/m3). Some sensitive individuals may experience asthma-like symptoms, and dermatitis, even at very low doses [1]. Previously sensitized individuals can develop severe narrowing of the bronchi at very low concentrations such as 0.3 ppm (369 ug/m3). Bronchial narrowing may begin immediately, or can be delayed for 3 to 4 hours. Effects may worsen for up to 20 hours after exposure and can persist for several days [1]. The Threshold Limit Value (TLV), Short–term Exposure Limit (STEL) recommended by the American Conference of Government Industrial Hygienists (ACGIH) is also 0.3 ppm (369 ug/m3) [6].

Populations of humans that have received considerable attention in the literature as being particularly sensitive to formaldehyde exposure following inhalation and/or dermal contact include asthmatics and persons with dermal sensitization. The concerns involving asthmatics focuses on the potential changes in lung function parameters that formaldehyde may produce. Studies involving asthmatics have been somewhat conflicting, but generally indicate that formaldehyde does not induce airway hyper-reactivity at concentrations less than 3 ppm (3690 ug/m3) [2]. Symptoms of increased itching, sneezing, mucosal congestion, and transient burning sensation of the eyes and the nasal passages, were observed in a group of potentially sensitive individuals, some with dermal hypersensitivity, exposed to formaldehyde at a concentration of 0.4 ppm (492 ug/m3) for a period of 2 hours (Pazdrak et al. 1993) [2].

Dermal allergic reactions have been reported in doctors and nurses exposed to formaldehyde (Rudzki et al. 1989) as well as in fiberglass worker (Kilburn et al. 1985). Anaphylactic reactions have been reported in the literature (Maurice et al. 1986), in a description of a case in which anaphylaxis occurred in a patient due to skin contact with adhesives sterilized with formaldehyde prior to hemodialysis therapy. Other persons with dermal sensitization to formaldehyde are not likely to develop signs of respiratory insufficiency [2].

Although formaldehyde is readily absorbed into the body, it is also very quickly broken down. It is not stored in fat. Formaldehyde is also naturally produced in small amounts in the human body as a part of normal, everyday metabolism. The normal blood level of formaldehyde in humans is approximately 2.5 ppm (2500 micrograms per liter (ug/L)). Formaldehyde has a half-life in blood of approximately 1.5 minutes (Sullivan, 1999) [3]. Almost every tissues of the body has the ability to break down formaldehyde. It is usually converted to a non-toxic chemical called formate, which is excreted in the urine. In addition, formaldehyde can also be converted to carbon dioxide and breathed out of the body [2].

A level of concern for formaldehyde in trailers used for temporary housing would be 0.3 ppm (369 ug/m3), which is an effect level associated with the narrowing of the bronchi in sensitive individuals [1].

FEMA/EPA Sampling Plan:

During the FEMA/EPA temporary housing units sampling project an initial sampling event was conducted to establish baseline conditions for formaldehyde and VOC concentrations in indoor air. The initial sampling event was conducted in all trailers with doors and windows closed without ventilation. One 24-hour VOC sample and one 1-hour formaldehyde sample was collected in each trailer [4].

Upon completion of the initial sampling, the trailers were divided into two subsets: In one subset (Group A), the air conditioning system was set to cool (thermostat set at 72 degrees Fahrenheit and without targeted humidity control) and the bathroom static vents left open. No other ventilation was provided for the Group A trailers. In the second subset (Group B), ventilation was provided by opening all windows, static vents, and exhaust fan vents. Exhaust fans were not operated (turned on) [4].

Sampling for formaldehyde was conducted twice daily over a 14-day period while the Group A and Group B ventilation conditions were maintained. A total of 2284 formaldehyde samples were collected during the project. In addition, a final 24-hour sampling event for VOCs was conducted at the end of the 14-day period while the Group A and Group B ventilation conditions were maintained [4].

Sampling Results:

The outdoor background concentration of formaldehyde detected at the trailer staging area during the sampling project ranged from 1 to 87 ug/m3 with an average of approximately 6 ug/m3 [5]. The background level of formaldehyde detected was consistent with the levels detected in urban areas in other studies as previously stated.

From the data provided by FEMA, queries were conducted to determine the minimum, maximum, and average concentrations of formaldehyde detected each day for the two different ventilation methods (see attached data table). Ventilation in Group A trailers was provided by running the air conditioning system; while ventilation in Group B trailers was provided by opening the windows and vents. The average formaldehyde concentration per day for each method was plotted on a graph for comparison (see attached graph).

In Group A trailers, a total of 1090 samples were collected for formaldehyde throughout the entire sampling project. The concentrations of formaldehyde detected in all of the Group A trailers included a minimum of 3.4 ug/m3, a maximum of 3000 ug/m3, and an average of 490 ug/m3. In Group B trailers, a total of 1117 samples were also collected for formaldehyde. Formaldehyde concentrations in all of the Group B trailers included a

minimum concentration of 3 ug/m3, a maximum of 4500 ug/m3, and an average of 172 ug/m3.

Several general trends can be observed from the attached graph, concerning the 96 trailers involved in the sampling project. The graph indicates the average formaldehyde concentration per day for each of the two ventilation methods plotted side by side for comparison. After the fourth day of sampling, the two methods showed a general decline in formaldehyde concentration in all trailers for the remainder of the 14-day study. The trailers in Group B, overall and in general, had a lower average concentrations of formaldehyde than the trailers in Group A. The average concentration of formaldehyde per day in all of Group B was below the level of concern of 369 ug/m3, after the fourth day of sampling and for the remainder of the study. In the trailers in Group A, the average concentration of formaldehyde per day was lower than the level of concern of 369 ug/m3 only on two days, 9/29 and 10/7.

In addition to formaldehyde, other volatile organic compounds (VOCs) were also analyzed. Most of the other (VOCs) detected were in the low ug/m3 range. VOCs in the higher ug/m3 range included styrene and tetrachloroethene at a maximum concentration of 790 ug/m3 and 490 ug/m3, respectively. The concentrations of these VOCs were at levels not expected to produce adverse health effects.

III. Conclusions:

The method of ventilation which allows for the greatest number of air exchanges will be the most effective in lowering the concentration of formaldehyde. The method of ventilation used in trailer group B, of opening all windows, static vents, and exhaust fan vents, was more effective at lowering the concentration of formaldehyde during the period of this sampling project than the method of ventilation used in trailer Group A of running the air conditioning system with the bathroom static vents open.

The average concentration of formaldehyde per day in Group B trailers, after the fourth day of sampling and for the remainder of the study, was below the level of concern for sensitive individuals of 369 ug/m3 (0.3 ppm). The average concentration of formaldehyde per day in Group A trailers was above the level of concern for sensitive individuals in all but two days of the study.

The concentrations of the other VOCs detected during the sampling project were below levels expected to produce adverse health effects.

IV. Recommendations:

Formaldehyde is given off as a gas from the manufactured wood products, including plywood and particle board, used in new mobile homes. The amount of formaldehyde released from these products decreases slowly over time. Formaldehyde levels in indoor air are usually higher than the levels outdoors. The amount of formaldehyde in mobile homes is usually higher than it is in conventional homes because of the lower air turnover. Opening windows or using a fan to bring in fresh air is the easiest way to lower formaldehyde levels in the home and reduce the risk of exposure [2].

Formaldehyde is found in small amounts in many consumer products including household cleaners, antiseptics, medicines, dish-washing liquids, fabric softeners, shoe-care agents, carpet cleaners, glues, adhesives, and lacquers. When using these products, providing fresh outdoor air will reduce exposure to formaldehyde. Some cosmetics, such as nail hardeners, have very high levels of formaldehyde. Not using these products in a small room, or providing plenty of ventilation when they are used will reduce the level of exposure to formaldehyde [2]

Removing formaldehyde sources from the house will also reduce the risk of exposure. Since formaldehyde is found in tobacco smoke, not smoking or smoking outside will reduce exposure to formaldehyde. Unvented heaters, such as portable kerosene heaters, also produce formaldehyde. Not using these heaters in a home will help to prevent the buildup of formaldehyde indoors [2].

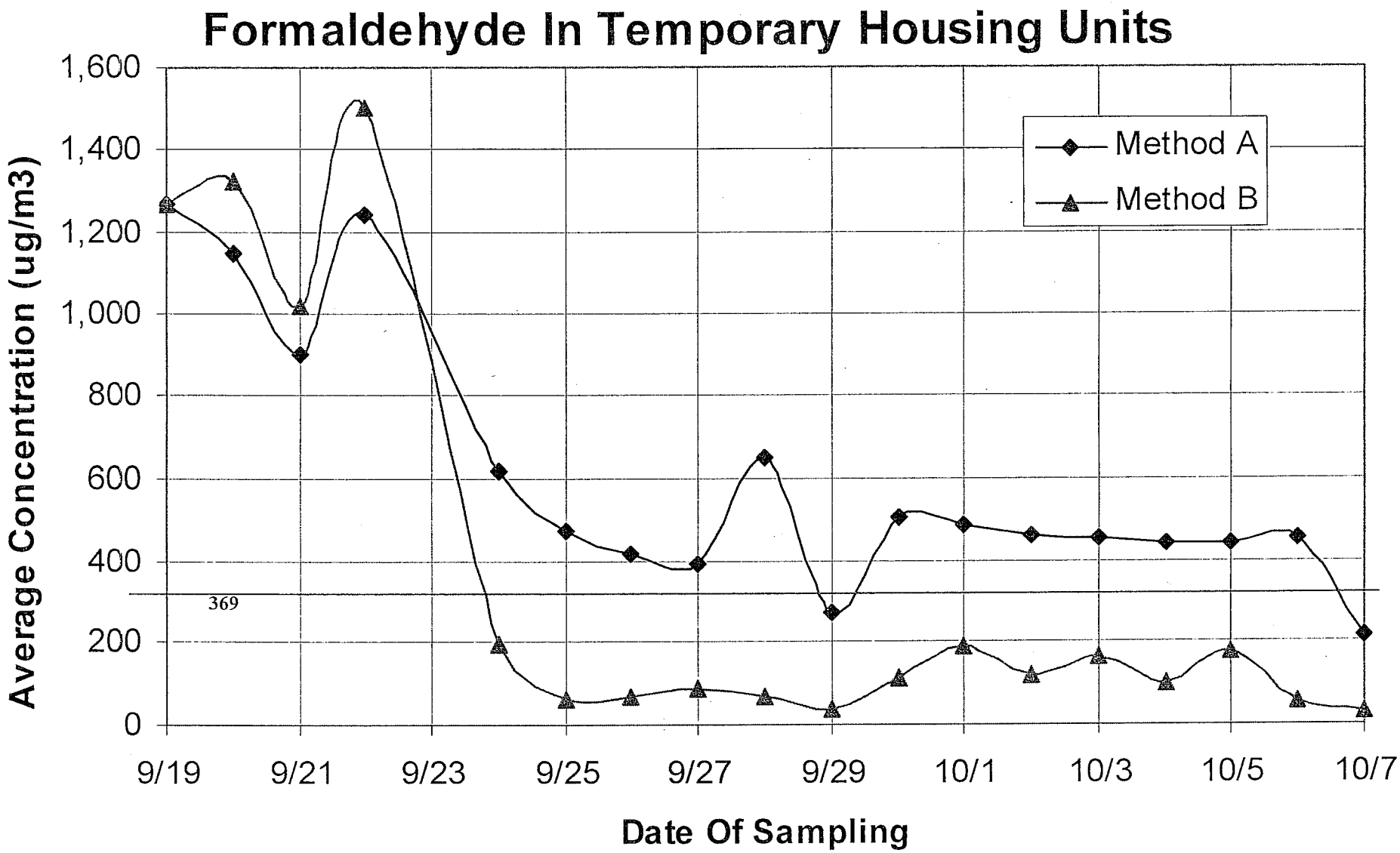
Some new permanent press fabrics also emit formaldehyde. Washing these new clothes before they are used will usually lower the amount of formaldehyde [2].

Increasing the ventilation to provide for the greatest number of air exchanges will be the most effective action in lowering the potential exposure to formaldehyde.

Prepared by:

Joseph D. Little, MSPH
CDR U.S. Public Health Service
Emergency Response Coordinator
Prevention Response and Medical Support Branch
Division of Toxicology and Environmental Medicine

Scott V. Wright, MS
Emergency Response Coordinator
Prevention Response and Medical Support Branch
Division of Toxicology and Environmental Medicine


Formaldehyde In Temporary Housing Units
Average Concentration (ug/m3)
1,600
1,400
1,200
1,000
800
600
400
369
200
0
9/19
9/21
9/23
9/25
9/27
9/29
10/1
10/3
10/5
10/7
Date Of Sampling
Method A
Method B

Formaldehyde in Temporary Housing Units

Analyte	Method	Date	Min	Ave	SDs	GM	GSD	Max	N
Formaldehyde	A	9/19/2006	5.3	1,264.98	842.62	629.2	6.41	2500	17
Formaldehyde	A	9/20/2006	6.6	1,145.12	680.63	740.82	4.5	2100	13
Formaldehyde	A	9/21/2006	5.2	901.69	808.84	352.25	7.56	2200	14
Formaldehyde	A	9/22/2006	4.6	1,240.08	913.94	530.62	8.23	3000	15
Formaldehyde	A	9/24/2006	3.4	619.28	442.71	339.85	4.8	2000	116
Formaldehyde	A	9/25/2006	3.9	473.75	348.04	295.34	3.63	1700	103
Formaldehyde	A	9/26/2006	4.6	418.41	314.28	258.26	3.62	1500	118
Formaldehyde	A	9/27/2006	3.4	390.05	301.96	239.74	3.53	1400	118
Formaldehyde	A	9/28/2006	4.3	649.4	440.62	426.74	3.44	1700	56
Formaldehyde	A	9/29/2006	3.6	268.04	187.82	172.03	3.44	800	56
Formaldehyde	A	9/30/2006	3.5	502.38	340.1	300.86	4.11	1400	57
Formaldehyde	A	10/1/2006	4.6	484.59	305.55	323.51	3.51	1200	53
Formaldehyde	A	10/2/2006	4.3	460.32	308.35	290.9	3.69	1200	61
Formaldehyde	A	10/3/2006	4.7	455.03	303.04	305.85	3.19	1200	60
Formaldehyde	A	10/4/2006	3.8	439.4	298.68	273.49	3.82	1300	55
Formaldehyde	A	10/5/2006	4	442.35	302.55	287	3.39	1200	59
Formaldehyde	A	10/6/2006	3.4	453.12	292.51	282.13	3.95	1300	60
Formaldehyde	A	10/7/2006	4.8	216.39	137.36	151.29	2.91	590	59
Formaldehyde	B	9/19/2006	5.9	1,263.29	758.39	845.02	4.07	2800	17
Formaldehyde	B	9/20/2006	4.3	1,322.25	969.85	509.78	9.39	2800	17
Formaldehyde	B	9/21/2006	190	1,018.57	644.38	784.36	2.26	1900	14
Formaldehyde	B	9/22/2006	4.6	1,496.07	1,353.82	585.53	8.16	4500	15
Formaldehyde	B	9/24/2006	3	196.6	138.31	138.92	2.8	600	117
Formaldehyde	B	9/25/2006	3.9	61.1	41.37	47.36	2.2	190	112
Formaldehyde	B	9/26/2006	3.4	66.45	40.35	52.24	2.24	180	114
Formaldehyde	B	9/27/2006	3.4	90.56	56.44	69.68	2.36	240	112
Formaldehyde	B	9/28/2006	4	72.34	42.96	57.34	2.2	180	59
Formaldehyde	B	9/29/2006	3.5	40.49	25.95	32.54	2.04	130	60
Formaldehyde	B	9/30/2006	4.9	115.49	72.12	88.75	2.37	300	60
Formaldehyde	B	10/1/2006	3.8	185.87	124.93	130.36	2.93	560	65
Formaldehyde	B	10/2/2006	3.9	120	77.48	90.09	2.51	340	56
Formaldehyde	B	10/3/2006	4.4	162.19	105.31	116.45	2.75	450	57
Formaldehyde	B	10/4/2006	4.1	102.76	77.13	72.14	2.58	330	62
Formaldehyde	B	10/5/2006	3.5	178.46	118.41	125.5	2.9	470	61
Formaldehyde	B	10/6/2006	3.4	53.62	39.54	37.69	2.61	180	60
Formaldehyde	B	10/7/2006	3.6	29.06	16.9	24.29	1.92	95	59

References:

1. Agency for Toxic Substances and Disease Registry, Managing Hazardous Materials Incidents, Medical Management Guidelines for Acute Chemical Exposures, Formaldehyde. Atlanta, ATSDR, 2001.

2. Agency for Toxic Substances and Disease Registry, Toxicological Profile for Formaldehyde. Atlanta, ATSDR, July 1999.

3. National Library of Medicine, Hazardous Substances Data Bank (HSDB), Formaldehyde, 2006. http://toxnet.nlm.nih.gov.

4. U.S. Environmental Protection Agency, Formaldehyde Sampling at FEMA Temporary Housing Units, Task Specific Addendum to: Contingency Air Monitoring and Sampling Plan for C&D Burning or Grinding Sites, USEPA, September 23, 2006.

5. Federal Emergency Management Agency, Formaldehyde in FEMA Family Units Sampling Program, Baton Rouge, LA, Field Documentation, Data Files, and Analytical Data DVD. FEMA, November 13, 2006.

6. American Conference of Government Industrial Hygienists, Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices. Cincinnati, ACGIH, 2006.

Exec. Summary 1/25/07
last modified 1/29/07 11:58 am

Formaldehyde Sampling at FEMA Temporary Housing Units
Baton Rouge, Louisiana

Executive Summary:

The ATSDR Emergency Response program was requested by the Federal Emergency Management Agency (FEMA), Office of General Counsel (OGC) to review and provide an evaluation of analytical data related to a project involving formaldehyde sampling at FEMA temporary housing units located in Baton Rouge, Louisiana. The examples of temporary housing units used in the study are similar to those utilized by Hurricane Katrina displaced persons.

The objectives of the sampling project included the establishment of general baseline concentrations of formaldehyde and other VOCs in the 96 trailers involved in the study, in addition to the evaluation of the general effect of two separate and distinct ventilation practices used on these particular trailers. In Group A, ventilation was provided by running the air conditioning system; in Group B, ventilation was provided by opening windows and vents. The study involved a 14 day sampling period and was not intended to evaluate longer term formaldehyde levels.

The purpose of the ATSDR consultation is to provide FEMA a clearer understanding of the issues associated with formaldehyde in temporary housing units. The consultation is not intended to set guidelines for FEMA's future policy. The conclusions derived from the sampling of the 96 trailers are for those trailers only, and are not necessarily applicable to all other trailers due to numerous uncontrollable variables

In the 96 trailers sampled, the method of ventilation used in trailer group B, of opening all windows, static vents, and exhaust fan vents, was more effective at lowering the concentration of formaldehyde during the period of this sampling project than the method of ventilation used in trailer Group A of running the air conditioning system with the bathroom static vents open. The method of ventilation which allowed for the greatest number of air exchanges was the most effective in lowering the concentration of formaldehyde.

The average concentration of formaldehyde per day in Group B trailers, after the fourth day of sampling and for the remainder of the study, was below the level of concern for sensitive individuals of 369 ug/m3 (0.3 ppm). The average concentration of formaldehyde per day in Group A trailers was above the level of concern for sensitive individuals in all but two days of the study. Individuals previously sensitized to formaldehyde may experience symptoms above 369 ug/m3 (0.3 ppm).

The concentrations of the other VOCs detected during the sampling project were below levels expected to produce adverse health effects.

Increasing the ventilation to provide for the greatest number of air exchanges will be the most effective action in lowering the potential exposure to formaldehyde.

1/24/07 Formaldehyde Consultation

- The purpose of the consultation is to provide FEMA Office of General Counsel a clearer understanding of the issues associated with formaldehyde in temporary housing units or trailers.

Concerns by FEMA about this issue are due to a pending lawsuit against FEMA concerning formaldehyde exposure from tempory housing Units.

FEMA has requested that the sampling data and the consult to remain confidential and all inquiries be referred to FEMA OGC.

The consult is not intended to set guidelines for FEMAs future policy. However, the consults technical clarifications of formaldehyde issues may or may not influence future policy decisions by FEMA.

- Key Issues Identified

1. The conclusions derived from the sampling of the 96 trailers are for those 96 trailers only, and not to be applied to all trailers.

2. In the 96 trailers sampled, Method B of opening of Windows and vents was effective in reducing formaldehyde concentrations below levels of health concern.

3. Individuals sensitized to formaldehyde may experience symptoms above 0.3 ppm.

- Questions raised by Tom Sinks;

1. How will this information be used once the trailers are in use?

(See 1st 4 paragraphs)
trailers are being taken out of service

2. Do these levels become a non-problem after time?

the study involved a 14 day sampling period and was not intended to evaluate longer term formaldehyde levels.
Other studies show formaldehyde levels in mobile home decrease over time with a halflife of 4 to 5 years. (Referenced on p. 3 of consult)

3. If the trailers are vented for X time, can they be occupied later and the AC used? Or are we saying that the only safe way is to always have vents open with or without AC?

In the 96 trailers involved in the study, the ventilation method of opening windows and vents lowered the formaldehyde concentration below the level of concern for sensitized individuals.

This implies that previously sensitized individuals (previously sensitized by exposure to liquid formaldehyde), not the general public, may experience symptoms in these 96 trailers, if the windows are not open.

meet w Mike Mon 2pm

Handwritten notes by Joseph D. Little, one of two authors on the February 2007 ATSDR Health Consultation – Formaldehyde Sampling of FEMA Temporary-Housing Trailers

Joseph Little MSPH, CDR U.S. Public Health Service, Emergency Response Coordinator, Prevention Response and Medical Support Branch (PRMSB), Division of Toxicology and Environmental Medicine (DTEM), Agency for Toxic Substances and Disease Registry (ATSDR).

Full report accessible here:
http://www.atsdr.cdc.gov/HAC/PHA/fema_housing_formaldehyde/formaldehyde_report_0507.pdf

From Joseph Littles log book

6/28/06

1000 Conf call FEMA

Formaldehyde in temporary housing trailers in Hurricane Katrina affected areas.

CDC DEOC Willie Phillips
ATSDR S. Wright
D. Hanley
Peter Kowalski
Alan Crawford
Gary Perlman DRO

CDC/NCEH Don Benton
EPA 6 Sam Coleman
FEMA

Formaldehyde sampling in trailers across different manufacturers.

ATSDR MRL chronic inhalation .008 ppm ?

EPA Chronic lifetime risk based concentration ?
0.14 mg/m^3

from JL logbook

7/13/06

1400 pacific time

FEMA Conference call
called in from Westin Hotel, Los Angeles, CA
w. Ronnie Crossland EPA 6
Gary Perlman AFSOR DRO
re: Formaldehyde testing in temporary housing Trailers
also on conf call:
Sam Coleman EPA 6
Dana Tulis EPA HQ
Don Benton CDC/NCEH
Steve Mason EPA 6
Patrick Preston FEMA OGC
FEMA Baton Rouge
FEMA HQ Public Affairs
NCCA TRO

concern about Formaldehyde in temporary housing trailers.
Class action litigation against FEMA and manufacturers.

Discussed Formaldehyde issues.
Formaldehyde exemplified
New homes 30 days after construction .035-.45 ppm
Older homes < .05 ppm
Mobile homes w CFI .02-.8 ppm
odor threshold ~.5 ppm low .05 ppm
Sensitive individuals effects .3 ppm
(narrowing of bronchi)

7/13/00

ATSDR int inh MRL .03 ppm
(monkeys, hoarseness, nasal discharge)

Potential ATSDR guidance level ~ .03 ppm
for sensitive individuals.
This level for sensitive individuals only
would most likely be exceeded in most structures.
Applicable to small percentage of population.
Sensitive individuals only.

Reviewed draft sampling plan

FEMA contacts for information.
Gail Haubrich
Stephen Miller

Need to review pamphlet from FEMA
also Fact Sheet for CADHH

EPA contact for research
Gary Newhart EPA 6
513-470-8662

Ronnie Crossland 214-329-8309

from JL log book

7/17/06

1400 FEMA Conf. Call Katrina
Formaldehyde in temporary housing trailers
ATSDR S. Wright
L. Cseh
Saone Coleman EPA 6
Dana Tulis EPA HQ
Tracy Hanes FEMA LATRO
(transition recovery office)
Kevin Souza FEMA HQ
Rick Preston FEMA
Jim Stark FEMA

Issue elevated to Congressman ..
pending litigation against FEMA and manufacturers
FEMA requests comprehensive testing of
trailers for Formaldehyde

from JL log book

7/20/06

1100 FEM/EPA Conf. Call

Hurricane Katrina

Formaldehyde in temporary housing trailers

Scott Wright	ATSDR	
Robert Williams	ATSDR	
Gary Perlman	ATSDR	DRU
Ronnie Crossland	EPA	6
Steve Mason	EPA	6
Steve Miller	FEMA	Baton Rouge
Dawn Tulis	EPA	HQ
Gail Haubrich	FEMA	Baton Rouge

Primary FEMA contact in New Orleans
Martin McNeese

96 trailer units to be sampled

Start sampling in 1 month

1335

from JL log book

7/25/06

0907 Gary Perlman ATSDR DRO
617-918-1492
requested to email Roxie Crossland EPA6
about ATSDR review of Sampling plan

from JL log book

7/27/06

TOO

FEMA/EPA Conf. Call
Hurricane Katrina
Formaldehyde in temporary housing trailers
Ronnie Crossland EPA 6
Dana Tulis EPA HQ
FEMA

Revised draft sampling plan by 7/28
Sampling period will be 14 days.
2 separate sampling groups. with and without ventilation and air conditioning.
air samples collected for both 1 hour morning and evening.

from JL log book

8/1/06

1500 Conf Call
LADHH Formaldehyde Fact Sheet
Gary Perlman ATSDR DRO
Scott Wright ATSDR
George Pettigrew ATSDR DRO
Diane Diggs LA DHH
Ken Lanier LA DHH
Ronnie Crossland EPA 6
Dan Tulis EPA HQ
Beverly Negri EPA
Jon Rauscher EPA
Tom Harris LADEQ

ATSDR concurs with the information provided in the LADHH fact sheet.
LADHH has recieved ~ 30 calls concerning formaldehyde in trailers
LADHH initially planned to print 5000 copies but will reduce that now. LADHH fact sheet will be distributed for calls coming into LADHH
FEMA has produced a fact sheet on formaldehyde and plans to print 270,000 copies.
EPA requested LADHH to check reference concerning airing out trailer 2 weeks before occupancy.

1540

from JL log book

8/1/06

2125 pm CDC DEOC Duty Officer
Biowatch Monitor at
Camp Legune, S C
Tularemia

1500 Conf call
LADHH Formaldehyde Fact Sheet
Gary Perlman ATSDR
George Pettigrew ATSDR to
Scott Wright
LADHH
EPA
LADEQ
LDHHS has recieved ~ 30 call concerning
Formaldehyde.
LDHHS had planned to print 5000 copies
but now reevaluating.
FEMA plans to print 270,000 copies
of their own separate fact sheet
LDHHS may use theirs on a case by case
as needed basis

8/3/06

from JL log book

700

FEMA/EPA Conf Call

Katrina

Formaldehyde in temporary housing trailers.

96 trailer units will be tested

3 weeks before electrical power can be provided at trailer sampling area.

Contractor orientation for sampling activities 8/14.

FEMA requesting testing for other chemicals?

EPA will not provide conclusions from sampling data.

1730

from JL log book

8/10/06

800-320-4330
pin # 588754

1700 FEMA/EPA Conf Call
Formaldehyde testing
Representative Sample
Trailers used for temporary housing for Hurricane Katrina victims.

Dana Tulis	EPA
Ronnie Crossland	EPA
Rick Preston	FEMA
Kevin Sousa	FEMA
Martin McNeese	FEMA

Security at staging area
EPA badges for EPA and EPA contractors.
Trailers onsite by end of next week.
Documentation of unified air masses will take 2-4 days.
Contract for electrical work should be awarded this afternoon.
3 weeks to complete electrical hook up.
~ Sept. 5.
Additional VOCs to be monitored
BETX
Benzene
Ethyl Benzene
Toluene
Xylene

from JL log book

FEMA release of status report
EPA name used without clearance from EPA.
Private citizens have been calling EPA concerning the FEMA status report.
EPA will provide data to FEMA.
EPA will not be providing interpretation of data.

1725

8/12/06

800-320-4330
pin # 588754

1700 FEMA/EPA Conf call
deposit for electrical work at trailer staging area given today.
Start date for electrical work Sept. 15.
Sampling plan updated to include other VOCs.
next conf call in 2 weeks.

9/19/06

1130 FEMA/EPA Conference Call
Formaldehyde Testing
Temporary Housing Units
Hurricane Katrina
Gail Haubrich
Betsy Hall
Sampling started mon
Baseline sampling on 24 units completed yesterday.
Discussed future data analysis
1200 next call Thurs 5pm.

from JL log book

9/21/06

1700 FEMA/EPA Conf Call
Formaldehyde in Temporary Housing Units
Katrina
Gail Haubrich FEMA
John Rauscher EPA
Ronnie Crossland EPA
Mon. VOC sampling
Tues. Formaldehyde sampling
Reg. 6 EPA recieved FOIA request concerning air sampling results for Formaldehyde in Trailers.
Lab analysis has not yet been conducted. There are no air sampling results at the present time.
EPA will provide results to FEMA.
FEMA will provide results to ATSDR not EPA.
Data results may be available Nov. 6
next conf call in 2 weeks

1720

from JL log book

10/19/06

1700 FEMA/EPA Conference call
Formaldehyde in Temporary Housing Units.
John Rauscher EPA 6
Dana Tulis EPA

Suma Cannisters
VOC and Formaldehyde Sampling completed Columbus Day weekend.
Interferences Initially. Samples were rerun through GC Column.
2300 Formaldehyde samples collected.
5 samples only invalid.
EPA data report expected to go to FEMA on Nov. 13.
ATSDR evaluation of data will follow after FEMA provides copy of data to ATSDR.
next call Nov. 2 1700

720

[redacted]

from JL log book

11/30/06

1700 FEMA conference call
Formaldehyde in Temporary Housing Units
Sampling Project
Baton Rouge, LA
1-800-320-4330
Pin # 719216
Rick Preston FEMA Chief Counsel
FEMA representatives
EPA representatives
next call in 2 weeks 12/14

1710

from JL 10g 0001

12/19/06

1010 contacted Rick Preston
FEMA Chief Counsel
Formaldehyde in Temporary Housing Units
Sampling Project-
Baton Rouge, LA
Discussed general trends found in ATSDR
Formaldehyde Data evaluation.

Ventillation Method A, with AC on.
Most data points for the daily average were above a level that might bother sensitized individuals.

Ventillation Method B, with windows open.
All the daily average points past the 4th day of sampling were below a level likely to bother sensitive individuals.

Formaldehyde levels will most likely go up when trailers are closed up.

The more ventillation creating the most air exchange is best for reducing formaldehyde levels.

1/24/07 Formaldehyde Consultation ★ DTEM response to Tom's questions ①

- The purpose of the consultation is to provide FEMA Office of General Counsel a clearer understanding of the issues associated with formaldehyde in temporary housing units or trailers.

Concerns by FEMA about this issue are due to a pending lawsuit against FEMA concerning formaldehyde exposure from tempory housing units.

FEMA has requested that the sampling data and the consult to remain confidential and all inquiries be referred to FEMA OGC.

The consult is not intended to set guidelines for FEMAs future policy. However, the consults technical clarifications of formaldehyde issues may or may not influence future policy decisions by FEMA.

- Key Issues Identified

1. The conclusions derived from the sampling of the 96 trailers are for these 96 trailers only, and not to be applied to all trailers.

2. In the 96 trailers sampled, Method B of opening of Windows and vents was effective in reducing formaldehyde concentrations below levels of health concern.

3. Individuals sensitized to formaldehyde may experience symptoms above 0.3 ppm.

- Questions raised by Tom Sinks;

1. How will this information be used once the trailers are in use?

(see 1st 4 paragraphs)
trailers are being taken out of service

2. Do these levels become a non-problem after time?

the study involved a 14 day sampling period and was not intended to evaluate longer term formaldehyde levels.
Other studies show formaldehyde levels in mobile home decrease over time with a halflife of 4 to 5 years. (Referenced on p. 3 of consult)

3. If the trailers are vented for X time, can they be occupied later and the AC used? Or are we saying that the only safe way is to always have vents open with or without AC?

In the 96 trailers involved in the study, the ventilation method of opening windows and vents lowered the formaldehyde concentration below the level of concern for sensitized individuals.

This implies that previously sensitized Individuals (previously sensitized by exposure to liquid formaldehyde), not the general public, may experience symptoms in these 96 trailers, if the windows are not open.

meet w Mike Mon 2pm

For the file.

Response to Congressman Waxman's letter dated August 24, 2007.

Item #3, request for documents relating to ATSDR's decision to use 0.3 ppm as a level of concern for formaldehyde in trailers used for temporary housing.

The decision to use the 0.3 ppm formaldehyde in air as a reference point was based on the fact that it was the lowest actual human effect level found in the peer reviewed literature from ATSDR and the National Library of Medicine. The 0.3 ppm was taken directly from the ATSDR Medical Management Guideline for Formaldehyde. This document states "Previously sensitized individuals can develop severe narrowing of the bronchi at very low concentrarion (e.g., 0.3 ppm). Bronchial narrowing may begin immediately or can be delayed for 3 to 4 hours; effects may worsen for up to 20 hours after exposure and can persist for several days."

The ATSDR Acute and Intermediate Minimal Risk Levels (MRL) were derived from effect levels higher than 0.3 ppm, and used several safety factors to lower them.

The ATSDR Acute MRL was derived from an effect level of 0.4 ppm in humans for symptoms of increased itching, sneezing, mucosal congestion, and transient burning sensation of the eyes and the nasal passages, in volunteers exposed to formaldehyde for 2 hours. The effect level was divided by an uncertainty factor of 9 (three for the use of a minimal lowest observed adverse effect level (LOAEL) and three for human variability) to derive the Acute MRL of 0.04 ppm.

The ATSDR Intermediate MRL was derived from a no-observed adverse effect level (NOAEL) of 0.98 ppm. This is a level where no effects were observed. The lowest level in which effects were observed in this study was 2.95 ppm. The effects were observed in monkeys exposed to formaldehyde for 22 hours/day, 5 days/week, for 26 weeks. The effects observed at 2.95 ppm included clinical signs of nasopharyngeal irritation (hoarseness and nasal congestion and discharge) and lesions in the nasal epithelium. The no-effect level of 0.98 ppm was divided by an uncertainty factor of 30 (3 for extrapolation from animals to humans and 10 for human variability) to derive the Intermediate MRL of 0.03 ppm.

The ATSDR Chronic MRL was derived from an effect level of 0.24 ppm in humans for changes in nasal tissue specimens from a group of 70 workers employed for an average of 10.4 years (range 1–36 years) in a chemical plant that produced formaldehyde and formaldehyde resins for impregnating paper. The lowest observed adverse effect level (LOAEL) of 0.24 ppm was divided by an uncertainty factor of 30 (3 for the use of a LOAEL and 10 for human variability) to derive the Chronic MRL of 0.008 ppm.

The ATSDR Chronic MRL was not used as a reference point for comparison in the February 2, 2007 consultation because it was below background levels at the test site, and below background levels found in most urban areas throughout the United States. The ATSDR Acute and Intermediate MRLs were also not used as reference points for comparison in the February 2, 2007 consultation because they were both below levels typically found in newer conventional homes and office buildings throughout the United States.