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June 21, 2011

Steve Fuger
Director of Facilities Operations
Idaho State University
921 S. 8th Ave.
Pocatello, ID 83209

RE: Lead contamination in Room 114 and Room 112, Reed Gym (former firing range)

Dear Mr. Fuger:

This letter is to document concerns about lead contamination in Reed Gym following a site visit by staff from the Idaho Department of Health and Welfare, Division of Public Health, Bureau of Community and Environmental Health (BCEH) on May 18, 2011. This visit was coordinated with ISU Facilities Operations and the Idaho Department of Environmental Quality (IDEQ).

In collaboration with IDEQ, we performed a survey of lead levels in Rooms 112 and 114 of the basement of Reed Gym. This space was formerly used as an indoor gun firing range. Room 114 contains the metal deflector backdrop and a catchment pit for spent bullets. It is currently used for storage, and is locked. Room 112 is the area where the firing line existed for the range. It is now separated from Room 114 by a solid wood-framed wall, and has been remodeled into a classroom and activity space. There is no air exchange between Room 112 and Room 114, and one must use an outside hallway to go from one room to the other.

Lead is a toxicant that has deleterious effects on many organs and systems of the body. The greatest health concern from lead exposure is its impact on children's ability to learn. Even low-dose exposures can permanently damage the developing brain. Both pre- and post-natal exposures are a concern. In adults an elevated blood lead level has been shown to decrease kidney function, increase blood pressure, and is associated with higher rates of miscarriage. The lead levels in Rooms 112 and 114 exceed health-based comparison values. For indoor lead in dust, the US Environmental Protection Agency (EPA) and US Housing and Urban Development (HUD)

residential clearance limit is 40 µg per square foot (µg/ ft^2) for floors, and 250 µg/ ft^2 for indoor window sills. These clearance levels are set for the protection of children and assume a year-round, every day exposure scenario. Since Reed Gym is used by people of all ages, it is reasonable to consider a sporadic exposure scenario for children, though not a full-time residential exposure scenario. Thus, it may be prudent to use the 250 µg/ ft^2 standard as a reasonable clearance level for contact surfaces in Reed Gym Rooms 112 and 114 as this equates to using the 40 µg/ ft^2 for a duration of approximately 3-4 hours per day.

Preliminary hand held x-ray fluorescence (XRF) readings showed lead levels throughout Room 114 were consistently very high on floors and in floor cracks, on top of light fixtures, and on the bullet-deflecting metal backstop plate. XRF readings in Room 112 showed high lead levels only on top of the ductwork and light fixture. XRF serves as a good screening tool by providing real-time readings, but wipe sampling is preferred for quantification of lead in dust.

To determine lead levels in dust, samples were collected using a wipe method (NIOSH 9100) and these samples were analyzed by the State Bureau of Laboratories in Boise for total lead concentration using EPA Method 3050A. NIOSH reports lead in units of µg/ cm^2 while EPA and HUD use µg/ft^2. The results of the wipe sampling are shown below.

SampleID#	Room#	LOCATION IN ROOM	LEAD (µg per 100 cm2)	LEAD (µg per ft2)
1	114	File Cabinet, far left corner	51	474
2	114	Folding Chair, far left corner	28	260
3	114	Floor, far right corner, next to sand	2200	20400
4	114	Meidcal Equipment Case, mid-room	30	279
5	114	Shelf, left wall mid-room	34	316
6	114	Weight Bench, mid-room	48	446
7	114	Metal Backstop Plate, no impact	1300	12100
8	114	Metal Backstop Plate, impact zone	10100	93800
9	114	Locker, mid-room	21	195
10	114	Light Fixture Metal Diffuser Plate*	36000	334000
11	114	Gym Mat, mid-right side of room	120	1120
12	114	Wood Horses for Ski Sale, in sand	11	102
13	114	Floor at Firing Line, near workbench	88	818
14	114	Wood Shelf, near entrance	52	483
15	114	Tarp on Wood Shelf 19, near entrance	140	1300
16	112	Classroom, Top of Duct	220	2040
17	112	Classroom, Top of Light Fixture	440	4090
18	112	Classroom, Top of TV on Cart	<5	<46.5
19	112	Classroom, Top of Storage Cabinet	8	74
20	112	Classroom, New Wood Floor	<5	<46.5
21	na	Field Blank	<5	<46.5

Using 250 µg/ ft^2 as a comparison value, two of the five samples in Room 112 exceeded the 250 µg/ ft^2 clearance level. These samples were taken in out-of-reach areas near the ceiling (on the light fixture and top of the duct), and the dust is bound in an oily residue. There are no registers or other openings in the ductwork in Room 112, so we are not concerned about movement of lead dust via ducts beyond Room 112. Though the lead in Room 112 is bound in an oily residue and not on a contact surface, it is still recommended that these high lead locations be carefully wet wiped while using plastic sheeting to cover the new flooring in the room to prevent possible lead contamination.

Also, proper personal protective equipment (PPE) and employee hygiene programs should be developed for maintenance personnel doing this cleaning to reduce exposure.

There is no duct work in Room 114, so we are not concerned about movement of lead dust via ducts beyond Room 114. In Room 114, thirteen out of the fifteen samples taken exceeded the 250 μg/ ft^2 clearance level. Those sampled items with hard surfaces (furniture) that were close to the clearance level could likely be thoroughly wet wiped to bring them below 250 μg/ ft^2 and be salvaged for use outside the room. Again, proper PPE should be worn. Those two items that are below the 250 μg/ ft^2 clearance level should also be HEPA vacuumed or wet wiped to remove dust before re-use since one wipe sample may not be representative of the lead dust loading on the entire surface of the item. Those porous items higher than 250 μg/ ft^2 of lead should be properly disposed of. For example, sample ID #15 (a tarp with lead dust concentration of 1300 μg/ ft^2) should be disposed of rather than cleaned. Any item that is not easily wiped clean using a wet method should also be disposed of. The metal backstop plate and the sand trap in Room 114 will need to be removed or encapsulated in place by an EPA-approved lead remediation contractor. It is possible that overlay/encapsulation will be necessary for the floor in Room 114 as well. Any disposal should be coordinated with IDEQ's hazardous waste staff.

Due to the high levels of lead dust in Room 114, there is a potential for serious liability to ISU. Room 112 contamination can likely be dealt with quickly by ISU maintenance staff to mitigate any possible liability from lead hazards.

For now, BCEH recommends:

- Room 112 duct and light fixture exterior surfaces should be wiped clean of lead dust using a wet cleaning method while utilizing proper personal protective equipment and employee hygiene programs. The new floor should be covered with plastic sheeting prior to cleaning to avoid any contamination and all lead contaminated materials be disposed of in accordance with IDEQ standards.
- Any future remodeling of Room 112, including replacement of carpet or other flooring, should be accompanied by lead testing to ensure that hidden lead dust is not re-released onto surfaces.
- Room 114 should remain locked. A tacky mat should be placed just inside the entrance to remove lead dust from shoes of workers when exiting the room. Lead can easily be tracked out of this room and contaminate other areas. Inhalation of lead dust is also a real health risk if work or other activities in the room suspend the fine dust found throughout the room.
- Signage on both sides of the door into Room 114. The exterior sign should clearly note that a lead dust hazard exists and entry is restricted. The interior sign should note that no objects are to be removed from Room 114 without first consulting ISU Facilities Operations to coordinate proper disposal or proper cleaning.
- None of the stored items in Room 114 should be allowed to leave the room unless properly cleaned first or bagged for disposal.
- Room 114 should be remediated by a professional lead abatement contractor as soon as possible.
- ISU continue to use BCEH for technical assistance on the cleanup and for health and safety training.

Feel free to provide my contact information (listed in the first page header) to other interested parties involved in this matter. If you have questions, please contact BCEH any time.

Best regards,

Kai Elgethun Ph.D., MPH
Public Health Toxicologist
Idaho Dept. of Health and Welfare

Attachments (1): Photo of Room 114.

Cc: Elke Shaw-Tulloch, MHS, Bureau Chief
Kara Stevens, Environmental Health and Injury Section Manager
Jim Vannoy, MPH, Environmental Health Education and Assessment Program Manager

Room 114, Reed Gym, ISU, showing the angled metal backstop and covered sand trap on the right side of the photo. Photo taken on 5/18/2011. Lead wipe samples were highest on the floor in front of the trap (center of the photo) and on the overhead light fixture diffuser plates.