

# Chapter 6

## Environmental Health

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### Introduction

Concern about the health effects of environmental contaminants continues at an all-time high. Only economic concerns such as unemployment, taxes, schools, and government budgets ranked higher in citizen opinions. A statewide community health needs assessments found that environmental concerns were among the top priorities.

Iowans are concerned about the quality of their drinking water, about recreational waters, indoor and outdoor air quality, lead poisoning, safe housing, and hazardous and solid waste.

Concern today is focused primarily on the health effects of environmental contamination and is a major element of the public's need for environmental protection. The public is bombarded with reports from the media, from government officials, as well as from the private sector.

Many of these reports either directly state or hint at adverse health effects from environmental contamination, but the health effects and risks are not clearly explained. In addition, the best solutions for dealing with these health hazards frequently are not discussed. Both public and local officials demand more sophisticated answers and expect details on actual risks and accurate solutions

As a result, the public is concerned, and at times confused, about the quality of their environment and the effects that it may be having on their health. Local health and building officials, conservationists, health professionals, and the public need better assessment of environmental information to understand actual risks and that often times real risks do not exist. Accurate assessment also allows local officials to deal with high-risk conditions and institute actions that will reduce or eliminate the problem.

The *Healthy Iowans 2010* initiative was established in response to these needs. The resultant environmental health goals and action steps for *Healthy Iowans 2010* focus on 1) documented health and safety effects from existing environmental conditions; 2) the assessment of risks; and 3) the actions or solutions for significantly reducing exposure to environmental contaminants.

Seventy-five representatives from various state, local, university, private, environmental health, and protection interests were formally involved in the process of

developing the following environmental goals and action steps.

There has been a dramatic increase in enthusiasm for developing effective goals and action steps from a similar process 10 years ago. Goals and action steps today better represent a consensus of well-documented, unmet environmental health needs for Iowa.

### Goal Statements and Action Steps

#### 6-1 Goal Statement

**Determine the prevalence of agriculture chemicals in small town private wells in concentrations exceeding the Environmental Protection Agency health advisory levels (HALs) or maximum contaminant levels (MCLs) for drinking water.**

#### Rationale

Private drinking water wells are not routinely sampled for agricultural chemicals, as wells are for public water supplies. Public water supplies are required by regulation to routinely collect and analyze samples for various types of contamination. Users of the water supply pay for these analytical costs through charges in their water bill. However, individual households with a private well in small towns are not required to monitor the well water; therefore, any monitoring is done on the well owner's own initiative.

The Iowa Department of Natural Resources does provide grants to counties for sampling and analyzing private wells. However, because the cost of analyzing for agricultural chemicals is high, the grant funds are used mainly for analyses for nitrates and bacteria. Also, if the water looks and tastes okay, well owners are hesitant to pay to have the well tested, especially for agricultural chemicals.

Small towns with private wells are usually located in an area where the water table is very shallow and it is easily accessed at a very reasonable cost. There is no need for a small town to install a municipal water system. However, because the water is so close to the ground surface, it is very susceptible to becoming contaminated.

There has been one recent instance in Iowa where private wells in a small town were sampled through another

program. One hundred forty-eight of 160 wells were sampled for nitrates with 50 wells exceeding the maximum contaminant level (MCL).

A total of 39 wells were sampled for common herbicides, with 31 wells showing one or more common herbicides and nine wells exceeding the MCL for at least one herbicide.

Twenty wells were sampled for acid herbicides with 13 showing contamination but none exceeding MCLs.

In this case, the pattern of contamination in the town strongly suggests that it is coming from two agriculture chemical dealer sites located in town. One dealer is still in business and the other site has been closed for some time.

There is, however, the potential that some of the contamination could also be coming from non-point sources, such as those resulting from applications of chemicals on farm fields or on town lawns. The exact source of contamination will be determined by further investigation.

How many of the other 150 plus small towns in Iowa have a similar situation? That question cannot be answered because the private wells in those small towns have been sampled and analyzed for agricultural chemicals.

The purpose of this study would be to 1) determine if contamination from agricultural chemicals is prevalent in small town private wells throughout the state; and (2) if there is a contamination problem, attempt to show if the contamination is from point sources (agriculture chemical dealer locations) or from non-point sources, such as chemical applications to fields or in town.

In some small communities with no sewage collection system, there is also the potential that nitrate contamination could be coming from the individual homeowner's sewage disposal system. Where nitrates are a problem, this study would also attempt to show if the nitrate contamination is coming from individual sewage disposal systems.

As an initial step, it would be intended to sample wells in 5 to 10% of the small towns with individual private wells. In each town selected, 20% to 30% of the wells would be sampled.

Each well sample would be analyzed for nitrates and commonly used pesticides. In order to get the largest number of samples analyzed for the funds available, use of immunoassay procedures will be considered. If the immunoassay analyses show contamination, a percentage of wells will be sampled again if necessary and the samples analyzed using complete laboratory procedures.

### **6-1.1 Action Step**

Identify the small towns in Iowa that rely on private wells for drinking water and determine the general geological setting of each town; next, identify the number of towns with private water supplies that have an existing or former agricultural chemical dealer site in town or near town; and for each town with private wells, determine if there are individual sewage disposal systems or a municipal sewage collection system; with completion of all activities during the year 2000. (An Iowa Department of Natural Resources action step.)

### **6-1.2 Action Step**

Develop a plan by October of 2000 to collect samples for pesticides and nitrate analyses from 20 to 30% of the drinking water wells in 5 to 10% of the small towns that rely on individual private drinking water wells; the plan will include estimated costs, estimated time of completion, and will delegate handling of different parts of the plan. (An Iowa Department of Natural Resources action step.)

### **6-1.3 Action Step**

Implement sampling plan for pesticides and nitrates. (An Iowa Department of Natural Resources action step.)

### **6-1.4 Action Step**

Complete a report using language that is easily understood and culturally sensitive within six months of completing the pesticide and nitrate sampling plan and make recommendations for future action during 2001. (An Iowa Department of Natural Resources action step.)

## **6-2 Goal Statement**

**Lower the percentage of private wells tested in Iowa showing contamination with coliform bacteria to less than 20% by plugging abandoned wells, replacing poor quality wells with new construction that meets present standards, and by renovating marginal wells.**

### **Rationale**

About 20% of the people in Iowa obtain their drinking water from private wells. Other than original construction standards, these wells are unregulated. Well owners must supply their own assurance that the quality of their water is adequate to protect their family's health.

Typically, water samples have shown that 35 to 58% of the private wells in Iowa are contaminated with coliform bacteria (an indication of surface water penetration) and 12 to 20% have nitrate levels above health standards, depending upon which survey results are used.

The Iowa Statewide Rural Well-water Survey carried out in 1988-1989 analyzed 1,048 samples from 686 sites. The survey found approximately 45% of the tested wells with coliform bacteria and 18% with nitrates above the health advisory level.

The Survey of the Quality of Water Drawn from Domestic Wells in Nine Midwestern States carried out in 1994 showed 58% of the well samples contaminated with coliform bacteria and 20% with nitrates above the health advisory level.

The University Hygienic Laboratory runs around 10,000 self-selected well water samples yearly. From 1981 to 1990, the annual average percentage of wells contaminated with coliform bacteria was about 35.

Since 1994, that average contamination rate has been about 28%. Some of that improvement may have come from increased and improved sampling provided under the Grants-to-Counties program. This may be an impact from the well testing and abandoned well plugging program on the quality of private wells.

Also, the well contractor certification program and the private-well construction-regulation program may be showing some effects. It is difficult to explain why this continuous sample testing program shows lower rates of contamination than the one-time scientifically designed programs.

Currently, there are 100,000 improperly plugged abandoned wells. The current program has plugged 35,000 wells, and the plan's goal is to plug another 35,000 by the year 2010.

According to the Centers for Disease Control and Prevention, for the period 1995-1996, 13 states reported a total of 22 waterborne-disease outbreaks associated with drinking water. Eleven of those outbreaks were linked to well water. Although illnesses caused by contaminated

private wells in Iowa are not reported or well documented, waterborne disease is documented well enough historically and worldwide that the serious impact of poor water quality on health is known.

From 1981 to 1994 the lowest annual average percentage of contaminated well samples tested by the University Hygienic Laboratory was 32%. Since 1994, that annual percentage has been 28.

### **6-2.1 Action Step**

Send a person into the field to spot-check well contractors and county sanitarians to evaluate compliance to new construction standards by drillers and on the

effectiveness of county inspection programs. (An Iowa Department of Natural Resources action step.)

### **6-2.2 Action Step**

Analyze by 2001 the data available from over 100,000 water samples tested under the Grants-to-Counties program to see if there can be better identification of which wells or well factors are more likely to be a problem; and to identify additional sampling that may be useful. (An Iowa Department of Natural Resources action step.)

### **6-2.3 Action Step**

Pursue aggressively plugging abandoned wells so that 35,000 are plugged by 2005 and the remaining 35,000 by 2010. (An Iowa Department of Natural Resources action step.)

### **6-2.4 Action Step**

Provide one annual training and education program to active, certified water well contractors; ensure better enforcement of the well contractor certification program and the new well permit program by conducting spot checks of well contractors so that over 50% are checked by 2005. (An Iowa Department of Natural Resources action step.)

### **6-2.5 Action Step**

Continue to provide incentives for the renovation of marginal wells to improve the overall average quality of wells statewide, with a renovation goal of 250 marginal wells per year. (An Iowa Department of Natural Resources action step.)

## **6-3 Goal Statement**

**Improve the quality of water supplied to 80% of Iowans by helping the public water supply systems meet all Environment Protection Agency requirements.**



## Rationale

The 1996 Safe Drinking Water Act Amendments established several new programs to help public water suppliers ensure a long-term, healthy water supply. These included: the availability of a Clean Water State Revolving Fund to provide loan funds for the update and replacement of water system infrastructure, as well as a Source Water Protection Program and Implementation Strategy.

There is also a Capacity Development Program to ensure that all public water supplies have the technical, financial and management resources needed. Additionally, there is an evaluation and protection program for disinfectant byproducts. These programs will be implemented to attain the goal.

### 6-3.1 Action Step

Facilitate the EPA-funded state revolving loan program to provide low-interest loans to public water systems to finance the cost of drinking water infrastructure by January of 2000. (An Iowa Department of Public Health and Iowa Department of Natural Resources action step.)

### 6-3.2 Action Step

Carry out the Federal Safe Drinking Water Act which mandated a source water protection plan for Iowa to help each community determine the source of its water supply and identify potential sources of contamination by January 2005; also, to see that 60% of the population served by community water supplies receive their water from systems with source water protection programs in place. (An Iowa Department of Natural Resources action step.)

### 6-3.3 Action Step

Develop and implement a capacity development strategy for public water supplies in Iowa to ensure that each system is a viable water supply entity by 2005; and that all new systems and current systems receiving state revolving funds will have developed and implemented a capacity development program. (An Iowa Department of Natural Resources action step.)

### 6-3.4 Action Step

Conduct source water assessment and remediation programs for all counties by 2010 that will reduce the nitrate concentration in Iowa's drinking water sources to levels less than half the MCL as stipulated by the United States Environmental Protection Agency. (An Iowa Department of Natural Resources action step)

### 6-3.5 Action Step

Ensure that public water supplies meet the new chlorine disinfection maximum levels and the revised disinfection byproduct standards, as these requirements become

effective by 2010. (An Iowa Department of Natural Resources action step.)

## 6-4 Goal Statement

**Provide plumbing consultations and enforcement to meet requirements of the Iowa Plumbing Code: Chapter 135.35 Code of Iowa; this includes technical code interpretations, enforcement, assisting communities in establishing city codes, updating and/or developing plumbing rules through an advisory committee; administering back-flow training and/or certification programs, and following up on Iowa Department of Natural Resources referrals on investigating "acute" fecal bacteria contamination of drinking systems caused by plumbing deficiencies.**

## Rationale

Current IDPH resources are inadequate to respond to the increasing demand for service to the public, building officials and consulting engineers and plumbers. An attempt is being made to handle the responsibility through limited available staff other programs. There is a need to reestablish a line-item budget and plumber positions to implement the required plumbing enforcement and consultation services. Plumbing funding and a plumber position were eliminated due to internal budget shifting.

The department annually receives 200 inquiries on water and sewer problems, 30 complaints that require an investigation, 175 requests for technical interpretations from building officials and engineers, 30 notifications from IDNR on "acute" bacterial contamination in water distribution systems and a number of requests from organizations to participate in conferences and training programs give presentations.

There is evidence of increased drinking-water contamination due to building and household plumbing. Backflow of wastewater and contaminants into potable water is generally considered a significant contributor to potable water quality problems in distribution systems. The number of reported backflow incidents is small, but many are not reported or not recognized as backflow. The number of cross connections (points where backflow of wastewater into drinking water is possible) is huge because of ignorance and the lack of regulation through much of Iowa.

There is no plumbing inspection and enforcement authority in most parts of Iowa to ensure no cross connections or that appropriate backflow preventers are installed and tested. Outside of jurisdictions that license plumbers, there is no required training to do plumbing and no check of competency.

### **6-4.1 Action Step**

Establish by July 1, 2000 an environmental specialist-plumber position and place it in the IDPH budget during the year 2000. (An Iowa Department of Public Health Action Step.)

### **6-4.2 Action Step**

Revise the Iowa State Plumbing Code to adopt a 2000 edition model code by July 1, 2001. (An Iowa Department of Public Health action step.)

### **6-4.3 Action Step**

Revise backflow prevention assembly tester rules to provide for third-party certification of backflow prevention assembly testers during 2003. (An Iowa Department of Public Health action step.)

### **6-4.4 Action Step**

Establish proper cross connection control as a requirement for the licensing of commercial agricultural chemical facilities during 2001. (An Iowa Department of Agriculture and Land Stewardship action step.)

### **6-4.5 Action Step**

Develop a half-day training course on cross-connection control for city officials, public health personnel, water supply operators, and commercial facility operators to be offered via the Iowa Communications Network (ICN) during 2002. (An Iowa Department of Public Health action step.)

### **6-4.6 Action Step**

Establish statewide licensing of plumbers and mechanical trade workers as well as plumbing inspectors by 2005. (An Iowa Department of Public Health action step.)

### **6-4.7 Action Step**

Expand plumbing code coverage to all Iowa buildings by 2007. (An Iowa Department of Public Health action step.)

## **6-5 Goal Statement**

**Establish a statewide swimming beach program that effectively handles current high-risk water quality and safety conditions.**

### **Rationale**

There is no technical assistance or monitoring program to help communities prevent avoidable water quality and safety problems at the estimated 200 swimming beaches in the state. Since these are areas where people are

specifically invited to swim, known water quality and safety hazards should be handled.

Although there is no monitoring system that reports drowning and disease incidents at public and private beaches, various incidents continue to be identified. A review of historical information from recent newspaper reports and incomplete reports from local health and medical sources show 34 examples of serious incidents.

Most incidents are drownings. A review of IDNR records since 1995 shows 15 drownings and serious head and neck injury incidents at public beaches. The list also includes cases of permanent paraplegic paralysis from diving injuries, and cases of disease from raw sewage in the beach area. The actual number of incidents is greater. A larger number of near drownings and undiagnosed isolated illnesses are indicated. A survey of Iowa facilities shows a significant number of major deficiencies which are known to lead to accidents.

It is believed that disease incidence is highly under-reported because of the passive nature of the reporting system, lack of awareness by medical practitioners, and the time between exposure and symptoms for many of the potential illnesses. The incident rate comparison between Iowa and other states which have a program shows a ten-fold higher rate in Iowa.

There are no mandatory requirements for beach location and construction, or for reporting of incidents. Beach operators should, but are not required to, survey the swimming areas for safety problems routinely. There is no indication that beach owners and operators are routinely checking for obvious contamination sources in the area around the beaches. There are no mandatory water quality standards for beach operations.

### **6-5.1 Action Step**

Establish and publish water quality guidelines, recommended monitoring frequencies and procedures for beach operators and public health professionals during 2001. (An Iowa Department of Public Health action step)

### **6-5.2 Action Step**

Develop voluntary training for beach operators and environmental health professionals on water quality and safety issues; and work with local boards of health to assure knowledge of effective inspection of bathing beaches during 2002. (Iowa Department of Public Health, Iowa Department of Natural Resources, and Iowa Environmental Health Association action step)

### **6-5.3 Action Step**

Establish a registration program for bathing beaches during 2003. (Iowa Department of Public Health action step.)

### **6-5.4 Action Step**

Establish regulations and an inspection program for bathing beaches during 2004. (Iowa Department of Public Health action step.)

## **6-6 Goal Statement**

**Reduce the risk to human health from contact with untreated or inadequately treated sewage in rural areas.**

### **Rationale**

Untreated wastewater can spread disease and contaminate drinking water sources. Pathogens in wastewater may be transmitted by direct contact with sewage or through contact with human, animal or insect carriers. Bacteria are responsible for several wastewater-related diseases, including typhoid, paratyphoid, bacillary dysentery, gastroenteritis, and cholera.

There may be as many as 100 different virus types, such as hepatitis, present in raw sewage. Parasites such as Cryptosporidium may also be present. Scientists believe there may be hundreds of disease-causing organisms in sewage and wastewater that have yet to be identified. Wastewater also may contain harmful chemicals and heavy metals known to cause a variety of environmental and health problems.

People who have suppressed immune systems because of HIV/AIDS, chronic disease, chemotherapy, or other conditions are especially at risk from wastewater-related diseases. Children, the elderly, and the urban and rural poor are also significantly more at risk than the general population.

Forty-five percent of Iowa houses lack connections to public sewers. Over 350 named communities have no public sewer system. At least half of these homes discharge inadequately treated human sewage into the environment. Thirty seven percent of new homes are not on a public sewer.

To provide proper sewage treatment and disposal for all new housing and to upgrade existing inadequate private sewer systems is going to take a significant statewide effort. Presently, each county is responsible for the private sewers within its jurisdiction. There are big differences in the effort and capability of these county programs.

No funding is available for assistance in financing private sewer systems. Individuals must pay the entire cost of a sewage disposal system at the time of construction. For the many existing inadequate systems, this can present a serious financial burden.

### **6-6.1 Action Step**

Establish by 2001, a state revolving loan fund for the repair or upgrade of existing individual onsite sewer systems. (An Iowa Department of Natural Resources action step.)

### **6-6.2 Action Step**

Establish by 2003, a statewide program for onsite wastewater to provide and coordinate training and technical support for county regulatory programs and expand this program by 2006 to include research on new technologies. (An Iowa Department of Natural Resources action step.)

### **6-6.3 Action Step**

Establish by 2003 requirements on a statewide basis for an evaluation of an individual's septic system at the time of a real estate transaction. (An Iowa Department of Natural Resources action step.)

### **6-6.4 Action Step**

Develop by 2005 a required training and certification program for county sanitarians on the design and inspection of residential septic systems. (An Iowa Department of Natural Resources action step.)

### **6-6.5 Action Step**

Assist in establishing management entities on a statewide basis that will design, finance, install, and maintain onsite sewer systems for small communities and other rural areas where central sewers are not financially feasible. (An Iowa Department of Natural Resources action step.)

## **6-7 Goal Statement**

**Reduce the number of unintentional exposures to household hazardous materials in Iowa by 30%.**

### **Rationale**

In 1998, there were 2,757 toxic exposure incidents attributed to household hazardous materials (HHM) that were reported to the Iowa Poison Center. Thirty nine percent of those were from cleaning products. Nationally, over 91% of all exposures reported to poison control centers occurred at a residence.

A United States Environmental Protection Agency consumer labeling initiative survey found that over 5% of respondents never read storage information on labels when buying or using indoor pesticides, cleaning products, and outdoor pesticides. The same study found that over 76% of respondents said that they never read disposal information when purchasing or using those products.

Approximately 18,200 tons of household hazardous waste (HHW) is placed in landfills annually in Iowa. Although household hazardous waste is exempt from the Resource Conservation and Recovery Act (RCRA) regulations, it is the most hazardous component of municipal solid waste and should not be put in landfills. A study of plastic landfill liners indicates that landfill liners will fail and “that leachate will migrate through the liner to potentially pollute the underlying groundwater.” Leachate is liquid drainage.

In 1998, the state collected over 118 tons of household hazardous waste through 25 one-day collection events, called toxic cleanup days. Additionally, local governments collected nearly 650 tons through five permanent centers. These are regional centers for the collection of household hazardous materials and hazardous waste from conditionally exempt small quantity generators (generators produce hazardous waste.)

The combined tons of HHM in landfills with the HHM collected equals an annual HHM generation rate of 18,968 tons. However, this does not include HHM that are currently stored and/or incorrectly disposed of by pouring down drains, storm sewers, on the ground, and directly into waterways.

At toxic cleanup days over 79% of participating Iowans surveyed said they have stored HHM in their homes for five years. Over 15% of the participating Iowans surveyed said they would have incorrectly disposed of their household hazardous waste if a collection event was not available. Of those participating, over 88% indicated a desire for on-going permanent collection or more frequent one-day collection events of HHM.

The Iowa Department of Natural Resources requires each regional collection center to establish on-going collection of household hazardous wastes and a HHM education program with involvement of an educational coordinator. In January 1999, operating and planned regional collection centers served only 33 counties or 45% of the state’s population.

### 6-7.1 Action Step

Raise the awareness of Iowans about the health, safety and environmental results of incorrect use or storage of household hazardous material and incorrect disposal of household hazardous wastes from following these steps:

- build a strong household hazardous materials education program that emphasizes correct use, storage, and disposal of HHMs and reduce levels of HHMs to help lower exposures by 2005;
- Establish a strong coalition of teachers, county naturalists, public health officials, recycling education coordinators, toxic cleanup day coordinators, regional collection center managers; and representatives from minorities, special at-risk populations, immigrants, refugees and other relevant organizations by the year 2002 to present a unified HHM educational message to raise the awareness of all Iowans about correct HHM management. (An Iowa Department of Natural Resources action step.)

### 6-7.2 Action Step

Increase availability of regional collection centers by the following actions:

- provide access to a regional collection center or other facility for every Iowan for correct disposal of household hazardous wastes by 2010;
- Assist in reducing injuries due to handling of HHM in the trash through on-going collections which help to prevent illegal dumpings; encourage and facilitate expansion of the regional collection center program. (An Iowa Department of Natural Resources action step.)

### 6-7.3 Action Step

Initiate a system to differentiate among minority, at-risk, immigrant and refugee populations regarding HHM exposure so a baseline can be established by the year 2005. (An Iowa Department of Public Health action step.)

## 6-8 Goal Statement

**Reduce the prevalence of blood lead levels greater than or equal to 10 micrograms per deciliter ( $\mu\text{g}/\text{dL}$ ) to 4% in children under the age of 6 years.** (Baseline: Data gathered from mandatory reporting of blood lead testing from 1992 to 1998 shows an estimated 12.6% of Iowa children under the age of 6 years have blood lead levels of 10 micrograms per deciliter ( $\mu\text{g}/\text{dL}$ ) or greater.)

### Rationale

Lead is a poison affecting virtually every system of the body, and is the single most preventable childhood disease. The Center for Disease Control and Prevention (CDC) estimates that 20% of children with blood lead levels greater than 20  $\mu\text{g}/\text{dL}$  will need special education. According to the CDC, childhood lead exposure costs the United States billions of dollars in medical and special

education costs for poisoned children and their decreased future earnings.

The rate of lead poisoning among Iowa children under age 6 is approximately three times the national average. One child out of seven tested in Iowa is lead-poisoned.

**Possible Health Effects of Lead-Poisoned Children**

**A State And National Comparison**

Health Effects	Blood Lead Levels	Iowa Percent of Lead Poisoning	National Average
Learning Disabilities	10 ug/dL*	12.6%	4.4%
Developmental Problems (hearing & growth)	15 ug/dL	4.8%	1.3%
Lower IQ's			
Nerve Problems	20 ug/dL	1.5%	%
Slower Reflexes	25 ug/dL	0.9%	0.0%
Kidney Problems			
Brain Damage (at very high levels)			

\*Note: ug=micrograms per deciliter

Source: Centers for Disease Control and Prevention and the Iowa Department of Public Health

From July 1992 to December 1997, 13 children had venous blood lead levels greater than or equal to 70 µg/dL, which is considered a medical emergency and can result in brain swelling, coma, and convulsions. The highest venous blood lead level reported was 360 µg/dL in an 18-month-old child.

The Iowa Department of Public Health (IDPH) recommends that all children under the age of 6 be tested for lead poisoning. However, this is currently not being done due to lack of funds and education in the medical community.

According to the 1990 census, Iowa has approximately 230,746 children under the age of 6 years.

Approximately 23,000 Iowa children (10%) are currently screened each year for lead poisoning. Around 200,000 children under the age of 6 in Iowa are not screened for lead. Each year an additional 30,000 Iowa children may have undiagnosed lead poisoning, based on the current lead poisoning rate of 12.6%.

The primary route of lead exposure to children is through deteriorating and/or accessible lead-based paint. Eliminating lead-based paint hazards will aid in prevention of future lead poisoning.

The single largest contributor to the childhood lead poisoning problem in Iowa is the current housing stock, which is one of the oldest in the nation.

Data from inspections by the IDPH and local Childhood Lead Poisoning Prevention Programs (CLPPPs) show that virtually all pre-1950 homes in Iowa contain some lead hazards.

Housing data from the 1990 census show that 42.9% percent of the housing in Iowa (488,375 units) was built before 1950. This is substantially greater than the national average of 26.9%.

Iowa ranks sixth among the 50 states in the percentage of housing units built prior to 1950. In 90 of Iowa's 99 counties, the proportion of housing built prior to 1950 ranges from 40% to 60%.

Locally staffed programs will be able to supply more timely and effective environmental and medical case management to lead-poisoned children as well as provide education about lead poisoning prevention. No two communities have the same set of problems or the same resources to handle these problems. Therefore, communities are better equipped to identify and handle problems faced by their residents.

Local health departments have reported increased screenings from education and coalition efforts, based on a 1998 survey by the IDPH lead program. Increasing coalition presence within the community and providing education to groups focusing on children's issues will increase overall community awareness of the problem and lead to primary prevention of lead poisoning.

**6-8.1 Action Step**

Initiate additional local childhood lead poisoning prevention programs and continue to support existing programs across Iowa so that by January of 2005 they will be available in all 99 counties. (Baseline: The programs currently serve 66 counties. An Iowa Department of Public Health action step.)

**6-8.2 Action Step**

Increase the number of children tested for lead poisoning so that by 2005 all Iowa children under the age of 6 years receive blood lead testing at the appropriate intervals for each child's risk. Data from the Systematic Tracking of Elevated Lead Levels and Remediation indicate that 10% of Iowa children under the age of 6 years are currently

tested for lead poisoning each year; increased testing can be accomplished by the following activities:

- educate physicians and other screening providers by current and additional local programs, and by sending a yearly reminder to physicians;
- educate parents; childcare providers; social workers; nutrition outreach workers; public health nurses; leaders of minority, immigrant, and refugee populations; and other groups that have frequent contact with children;
- Implement a required lead test for children entering child care; currently, a pre-entrance exam is required for all children entering a child care facility; the IDPH is developing a prototype of a physical exam form, including lead poisoning screening; the form would be distributed to child care providers and included in the child care provider handbook. (An Iowa Department of Public Health action step.)

### 6- 8.3 Action Step

Adopt by January 2001a model regulation for lead hazard reduction in the case of a lead-poisoned child, using the authority of the *Code of Iowa* 135.105B, which other cities and counties could adopt; and increase by July 1, 2002 the number of counties that have adopted such a regulation to include eventually all 99 counties; 10 counties have adopted such a regulation to date. (An Iowa Department of Public Health action step.)

### 6-8.4 Action Step

Increase the completion rate for lead hazard removal so that by 2005, 90% of homes with lead hazards associated with a lead-poisoned child will be treated within six months of hazard identification. (Data from the STELLAR database indicate that treatment is completed within six months for 25% of the homes in which hazards are identified.) (An Iowa Department of Public Health action step.)

### 6-8.5 Action Step

Develop a matching grant program by 2005 to aid families in covering the costs of treating lead hazards in their homes. (An Iowa Department of Public Health action step.)

### 6-8.6 Action Step

Increase community awareness of lead poisoning and community involvement in primary prevention activities by:

- Having local programs increase the number of coalitions dealing with childhood lead poisoning to cover all 99 counties and by increasing to 25% the

percentage of citizen (non-government or health care employees) involvement by January 2005. (Coalition and minorities, immigrant, and refugee populations currently serve 41 counties with a citizen involvement rate of approximately 5%);

- providing visual risk assessment education to social workers; child care providers; nutrition outreach workers; leaders of minority, immigrant, and refugee populations; and other groups who routinely visit homes with children;
- supporting the development and implementation of Farm\*A\*Syst/Home\*A\*Syst, an assessment program, using appropriate language and cultural sensitivity; additional state funds of \$600,000 per year would be needed to complete and would cover:
  1. start-up and continuing costs for local programs;
  2. the costs of environmental and medical case management for children identified as lead-poisoned;
  3. costs for blood lead testing for children with no other source of payment,
  4. Education and outreach to physicians, housing inspectors, social workers, parents, and homeowners regarding screening and primary prevention of childhood lead poisoning.

(An Iowa Department of Public Health action step)

### 6-8.7 Action Step

Utilize the STELLAR data system to record the race or ethnic background of lead-poisoned children and initiate a system to identify immigrant- and refugee-lead-poisoned children so a baseline can be established by 2005. (An Iowa Department of Public Health action step.)

### 6-9 Goal Statement

**Reduce deaths from unintentional non fire-related carbon monoxide (CO) poisonings from 0.70 per 100,000 (20.3 deaths per year) to none;** (baseline: from 1979 through 1988, 203 Iowans died due to inhalation of carbon monoxide according to an article in the *Journal of the American Medical Association* by Nathaniel Cobb, M.D. and Ruth Etzel, M.D., PhD.) **reduce carbon monoxide exposures and health problems caused by CO exposures;** (baseline: in 1997, a single utility reported finding 1,327 structures with more than 20 parts per million of CO.) **monitor for carbon monoxide poisonings in Iowa.** (Baseline: Iowa doesn't; the U.S. target is to increase the number of states that monitor CO from 7 to 50.)

## Rationale

Almost 5,000 people are injured each year from unintentional carbon monoxide poisoning-related incidents at a residential-societal cost of over \$1 billion annually, according to the United States Department of Health and Human Services in 1998.

The relative risk of hospital admission for congestive heart failure associated with an increase of only 10 parts per million (ppm) of carbon monoxide (CO) ranges from 110% to 137%, according to a 1995 issue of the *American Journal of Public Health*. In Iowa, there are thousands of homes where the ambient air is above 20 ppm of CO.

Carbon monoxide is the leading cause of poisoning deaths in the United States, accounting for 3,500 to 4,000 annual fatalities. Each year, an estimated 10,000 people either lose a day's work or seek medical attention because of CO poisoning. Approximately 2/3 of fatalities occur during a fire, most of the remainder result from exposure to products of incomplete combustion.

As many as 15% to 40% of survivors develop neuropsychiatric symptoms such as personality changes and memory impairment (from *Medical Toxicology: Diagnosis and Treatment of Human Poisoning*, 1988).

Carbon monoxide exposure, death, and disease data are not systematically collected in Iowa. Persons with cardiovascular disease, fetuses, the elderly, the ill and children are particularly sensitive to carbon monoxide cardiotoxicity. From 1994-1999, the Iowa State University Extension collected data and/or investigated 87 cases of carbon monoxide exposure. A total of 6,813 persons, including an estimated 6,000 persons at an indoor motorcycle event, were exposed, with 200 illnesses and 14 deaths reported. During the 1997-98 heating season, two Linn County emergency rooms collected CO exposure data, and found 5.3% of the people visiting emergency rooms had elevated concentrations of CO.

In Iowa, according to Dr. Tom Greiner, P.E. at Iowa State University, elevated concentrations of carbon monoxide have been found in single family residences, duplexes, apartments, residential garages, mobile homes, hotels, motels, nursing homes, retirement homes, elderly care facilities, in campers, day care facilities, preschools, nursery schools, schools, nursing homes, swine confinement buildings, car washes, vehicles, auditoriums, auto repair facilities, university classrooms, university dormitories, office buildings, eating establishments, correctional facilities, retail trade stores, and manufacturing plants.

Some Iowa cases include: in 1994, two persons died in an Iowa motel; in 1995, an 18-year-old female died in a drafty farm house from CO produced by a one-year-old furnace; in

1996 a Quad cities day care center was evacuated and 58 children and 11 adult staff were treated for CO poisoning; also in 1996 approximately 300 persons were exposed to CO during a June wedding; and again in 1996, 16 college students were overcome by carbon monoxide in their dormitory; and in 1997 and 1999, occupants of Iowa motels were evacuated and treated for CO inhalation.

Vehicles started in closed garages can cause death quickly. In 1997, two men unintentionally died from vehicle exhaust in a closed car wash. Persons committing suicide by operating vehicles in garages accidentally have killed others in the building, as occurred twice in Ames in 1988. In 1996, Greiner said that an Iowa housewife became ill from CO from a car warmed up in an open attached garage with the car door open. In the last six months of 1998, elevated concentrations of CO from propane-powered forklifts were found in three industries, with 22 employees requiring medical treatment.

Carbon monoxide is an insidious poison. It is colorless, odorless, tasteless and non-irritating. CO intoxication causes confusion, memory loss, and irrational thinking, making it difficult for victims to recognize they are being poisoned. Any appliance burning a fossil fuel can produce carbon monoxide. When improperly installed, improperly maintained, or after a burning and/or venting failure, carbon monoxide can enter occupied areas unnoticed.

Carbon monoxide alarms alert occupants of acute levels of carbon monoxide. A New Mexico study estimated that 57% of unintentional carbon monoxide poisonings could be prevented with carbon monoxide alarms, according to a 1998 article in the *Journal of the American Medical Association*. Alarms are required in certain dwelling units in Chicago; Kingston, N.Y.; and Linn County in Iowa. The U.S. Consumer Product Safety Commission recommends that every home be equipped with at least one UL listed CO detector. No other single measure will have a greater impact than requiring CO alarms.

Appliances that are out of adjustment, rusty, defective, and/or not venting correctly can produce high concentrations of carbon monoxide that can spill into occupied areas. The U.S. Environmental Protection Agency and the U.S. Consumer Product Safety Commission recommend yearly maintenance of heating appliances.

Greiner reported in 1999 that many heating contractors do not have equipment or training to diagnose or correct heating appliance problems. Iowa investigations have revealed that many heating contractors have caused carbon monoxide incidents, failed to identify CO problems, and failed to correct CO problems.

An Iowa heating contractor association in 1996 and 1997 unsuccessfully lobbied the Iowa legislature to require

licensing or certification and continuing education for heating contractors. The licensing requirement parallels a scald injury action step in the prevention section, which calls for statewide licensing of plumbing and mechanical tradesmen and extension of the State Plumbing Code to all new construction in Iowa.

From 30% to 100% of CO cases are initially misdiagnosed, according to two articles; the first in the *Journal of Emergency Medicine* in 1999, the second in *Annals of Emergency Medicine* in 1987. The effects are many and can mimic other diseases. CO poisoning is difficult to diagnose and, until recently, the only way to determine carbon monoxide levels in the blood was a blood test. However, federal approval has recently been given for the use of carbon breath analysis equipment, making CO screening simple, rapid, inexpensive, and non-intrusive. Linn County hospitals used this equipment in surveys it conducted in 1997-1998. Routine use of CO breath analyzers would decrease the number of misdiagnosis.

Treatment in a pressurized hyperbaric chamber with a high concentration of oxygen benefits patients beyond traditional oxygen treatment, reduces the incidence of delayed neurological (brain) symptoms, and is the recommended therapy in cases of acute exposure. However, according to some medical experts, rural Iowa hospitals are not transferring patients who meet the current indicators for hyperbaric oxygen, increasing the risk that these patients will suffer delayed neurologic results. Iowa collects CO death data, but there is no system to collect illness data. Fire departments respond to thousands of CO incidences every year, but their reporting system does not provide a separate category for carbon monoxide.

Utility companies also respond to thousands of CO incidents every year, but are not required to report these incidents. The magnitude of the problem is large. A single Iowa utility that voluntarily reported responded to 5,794 requests for carbon monoxide checks in 1997. Reporting is needed to determine the full extent of the problem, about the measures needed to reduce carbon monoxide poisoning, and to assure more adequate treatment for poisoned people.

Many CO exposures are non-intentional, infrequent, intermittent, sporadic, and unpredictable, according to Greiner. An investigation is needed to determine the cause of exposure, to correct the problem, and to suggest methods to reduce the probability of re-exposure. Medical investigation is needed also to determine the number of people exposed, medical treatment people receive, and final results. Long-term evaluations are needed in cases of severe poisoning.

Rural areas and small towns do not employ a mechanical inspector and have not adopted mechanical codes. Although

use of unvented gas heaters in dwellings with sleeping quarters is prohibited by the Uniform Mechanical Code (UMC), they are sold by fireplace stores and buildings centers throughout Iowa.

Requirements and recommendations for combustion, make-up, and ventilation air have been made in numerous codes and standards; for example, the Uniform Mechanical Code and the American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. Unfortunately, in most of Iowa, the standards have not been adopted and are not enforced. Many Iowa homes, schools, and businesses do not meet codes and standards. Additionally, providing adequate air improves the health and well-being of individuals. Where needed, codes should be enforced, and applicable standards should be reviewed and adopted.

Gas kitchen ranges, when used for extended periods of time without adequate ventilation, can produce potentially lethal concentrations of carbon monoxide, based on information at proceedings in 1994 held in St. Louis, Mo., where George Tsongas spoke on Field Monitoring of Elevated CO Production from Residential Gas Ovens.

Small engines easily produce sufficient CO to kill. In 1996, the National Institute of Occupational Safety and Health (NIOSH) identified two fatality cases in Iowa caused by carbon monoxide emitted from small engines used indoors. One caused the death of a 33-year-old farm owner who died while using a gasoline-powered pressure washer to clean a swine-farrowing (birthing) barn. In the second case, a 12-year-old boy was found unconscious near the door of a swine-farrowing building after using a gasoline-powered pressure washer inside, according to a NIOSH Alert.

Propane-powered engines can produce high concentrations of carbon monoxide. In 1996, 69 children and staff in a Rock Island, Ill. day care center were seen for medical treatment at three area hospitals after breathing carbon monoxide left in the building the previous day by floor maintenance personnel using propane-powered floor buffers. In 1998, three Iowa cases were investigated involving persons who were poisoned by CO from forklifts; and all required medical treatment. A spot-check of an auditorium during an Iowa indoor motorcross race found a peak CO concentrations of 92. The U.S. Environmental Protection Agency (EPA) ambient standard for outdoor air is 9 ppm. The NIOSH standard for indoor air in manufacturing is 35 ppm.

Every year, several Iowans will die in garages and vehicles from CO produced by internal combustion engines. In 1998 alone, four unintentional deaths occurred in car washes.

Smoke-filled rooms with poor ventilation and many smokers present a carbon monoxide risk to non-smokers especially to those with pre-existing problems. Although cigarette packages contain warnings that cigarette smoke contains carbon monoxide, most individuals do not realize the dangers of carbon monoxide in the smoke.

Carbon monoxide is a major toxin in cigarette smoke. A typical smoker will inhale carbon monoxide at concentrations of 400 ppm or more. Heavy smoking for several hours increases carbon monoxide levels in the body to health-damaging concentrations, reducing exercise tolerance, visual acuity, reasoning skills, and cardiac output. The total number of vascular (blood vessel) disease deaths caused by chemicals in tobacco smoke is greater than the number of cancer deaths attributable to smoking (K. Slama, *Tobacco and Health*, 1994).

Increases in carbon monoxide levels may result in chest pains for angina patients under exertion (in *Medical Toxicology: Diagnosis and Treatment of Human Poisoning*, 1988, by Matthew Ellenhorn and Donald Barceloux. The dangers of carbon monoxide are especially high for a developing fetus, which is adversely effected. Negative results include lower birth weight and an elevated risk of death in the first 28 days of infancy (neonatal period).

Usually, its victims do not recognize the toxic effect of carbon monoxide. Because carbon monoxide is a cumulative poison, at lower but lethal concentrations, many minutes of exposure are required before any ill effect is noticed and several hours are required for death. Often, persons suffer headaches and flu-like symptoms at the onset of exposure without recognizing the cause of their symptoms.

Whenever fossil fuels are burned, carbon monoxide can be produced and potentially inhaled by humans. Combustion of wood and charcoal fires in typical fireplaces and grills is always incomplete and produces extremely high concentrations of carbon monoxide. Many persons in Iowa have been poisoned and died when fireplace fumes have downdrafted or backdrafted into occupied quarters. Therefore, adequate ventilation must always be provided.

In 1997 a retired Iowa couple died from CO fumes from a charcoal grill while sleeping in their camper. During building fires, ever higher concentrations of carbon monoxide are produced; and in as little time as one minute breathing smoke from the fire can cause death (Ellenhorn and Barceloux).

### **6-9.1 Action Step**

Enact legislation during 2001 to require carbon monoxide alarms in new houses, upon change of house ownership, in rental properties, apartments, motels, hotels,

non-residential dwelling areas, businesses and public buildings. (An Iowa Legislature action step.)

### **6-9.2 Action Step**

Release publications and news releases annually stressing the need for carbon monoxide alarms and yearly maintenance of heating appliances. (An Iowa Department of Public Health and Iowa State University action step.)

### **6-9.3 Action Step**

Provide a minimum of two education programs concerning carbon monoxide annually. (An Iowa Department of Public Health and Iowa State University action step.)

### **6-9.4 Action Step**

Enact legislation during 2002 for statewide licensing and continuing education for heating contractors, plumbers, and mechanical workers. (An Iowa Department of Public Health and Iowa Department of Public Safety action step.)

### **6-9.5 Action Step**

Enact legislation during 2001 to implement a required education program for persons installing, maintaining, inspecting and/or repairing heating appliances and/or investigating carbon monoxide incidents; during 2008 require them to complete an IDPH-approved course and to repeat an education course every four years. (An Iowa Department of Public Health and Iowa State University action step.)

### **6-9.6 Action Step**

Extend the requirements of the State Mechanical Code to all new construction in Iowa during 2007. (An Iowa Department of Public Health and Iowa Department of Public Safety action step.)

### **6-9.7 Action Step**

Conduct a minimum of eight education programs on the symptoms, screening, treatment, surveillance, emergency response, or source investigations for medical personnel during 2003. (An Iowa Department of Public Health, University of Iowa, and Iowa State University action step.)

### **6-9.8 Action Step**

Require medical facilities during the year 2000 to report to the Iowa Department of Public Health within 48 hours all carbon monoxide incidents resulting in death, multiple poisonings, or severe poisonings; and require them to collect and report to the IDPH annually all cases of carbon monoxide poisoning. (An Iowa Department of Public Health action step.)

### 6-9.9 Action Step

Require the Iowa Department of Public Health, beginning in the year 2000, to collect data on carbon monoxide incidents; in cases involving death, multiple poisonings, or severe poisonings, the IDPH is to ensure that appropriate investigations are conducted to determine the source and causes of carbon monoxide and the health effects on the victim(s). (An Iowa Department of Public Health and Iowa State University action step.)

### 6-9.10 Action Step

Prohibit sales in Iowa of heating appliances not allowed by applicable Iowa codes during 2001. (An Iowa Department of Public Health and Iowa Department of Public Safety action step.)

### 6-9.11 Action Step

Require during 2001 that car washes post signs warning of the dangers of carbon monoxide. (An Iowa Department of Public Health action step.)

### 6-9.12 Action Step

Provide annual warnings of the effects of carbon monoxide in cigarette smoke, and coordinate efforts with other similar groups to assist them in meeting their goals. (An Iowa Department of Public Health, University of Iowa, and Iowa State University action step.)

### 6-9-13 Action Step

Enact legislation during 2000 to fund and implement a medical screening program for carbon monoxide using breath analyzers in emergency rooms and/or in emergency medical services (EMS) vehicles. (An Iowa Department of Public Health action step.)

## 6-10 Goal Statement

**Protect the public health from air pollutants emitted to the outdoors, maintain Iowa's compliance with all of the national primary ambient air quality standards, and continue implementation of the 1990 Clean Air Act; also, increase the public's awareness of Iowa's outdoor air quality and of the health effects of specific air pollutants of concern in the state.**

### Rationale

National ambient (surrounding) air standards have been established to protect human health from the most common air pollutants: sulfur dioxide, lead, ozone, carbon monoxide, nitrogen oxides, particulates (separate particles) smaller than 10 microns, and particulates smaller than 2.5 microns.

Facilities that emit these pollutants must not violate any set standards. Under the 1990 Clean Air Act, 188 hazardous air pollutants must be regulated. Control of these emissions reduces human exposure to these pollutants. Through increased public awareness of the sources of air pollutants and the health effects of air pollution, Iowans can make informed decisions regarding their business and personal activities as they relate to air quality.

### 6-10.1 Action Step

Continue the state's current administrative program of controlling air pollution by the issuance of permits regulating the emission of criteria pollutants and of 188 hazardous air pollutants, thus enforcing set emission limits, monitoring ambient air across Iowa, and thereby implementing the 1990 Clean Air Act; investigate and identify pollutant contributions from traditional and nontraditional sources of both criteria and hazardous air pollutants by use of such techniques as emission inventories: nontraditional sources include backyard refuse burning, livestock feeding operations, mobile sources and the use of consumer products; also, consider the need for establishing administrative rules to deal with air pollutants from nontraditional sources and hazardous air pollutants that are not currently scheduled for regulation under the federal Clean Air Act. (An Iowa Department of Natural Resources action step.)

### 6-10.2 Action Step

Continue to improve outreach efforts by publication and distribution of news articles, press releases, and brochures about Iowa's air quality; since a large percentage of hazardous air pollutant emissions result from personal activities and non-traditional sources; promote education and outreach to all Iowans so they may make informed decisions regarding their activities and use of consumer products; also, inform the public of potential health impacts on specific air pollution issues, such as animal feed lot emissions, open burning, industrial emissions and toxic air emissions. (An Iowa Department of Natural Resources action step.)  
(See Respiratory Disease: Asthma chapter for quality outdoor air environmental health goals and action steps on the control of open burning.)

## 6-11 Goal Statement

**Reduce the number of scald burn injuries requiring hospitalization by 30%.**

### Rationale

Hot water scald injuries affect over 35,000 children each year and kill 100 people, mostly children under age 5 and

adults over age 65, according to the National Coalition to Prevent Childhood Injury.

Although most hot water burns occur in the kitchen, the Consumer Product Safety Commission reports that the most severe burns are caused by water in the bathtub or the shower. These types of burns cover more of the body surface and tend to be deeper. Third-degree degree burns penetrate through the skin and destroy nerves and sweat glands. Contact with hot water can cause third-degree burns quickly.

Time for 3<sup>rd</sup> Degree Burns  
by Water Temperature

Water Temperature(F)	Time to 3 <sup>rd</sup> Degree Burn
110	6.7 hours
120	9 minutes
140	5 seconds
160	1 second

Source: American Society of Plumbing Engineers Meeting, October 1998 Paper presented by Dr. D. Bynum, Jr. et.al.

### 6-11.1 Action Step

Conduct training and provide materials regarding burn and scald prevention to child care providers, including information regarding standards for temperature setting on hot water heaters, and by selecting a registered plumbing contractor to service water-related appliances in child care facilities by the end of fiscal year 2001. (An Iowa Department of Public Health action step.)

### 6-11.2 Action Step

Publish information that is language and culturally sensitive and is directed at the plumbing trade about hot water scald burns, hot water heater installation, and anti-scald mixing valves by July of 2002. (An Iowa Department of Public Health action step.)

### 6-11.3 Action Step

Amend the Iowa State Plumbing Code to require anti-scald mixing valves on all bathroom fixtures (showers, bathtubs, and lavatories) that are installed after July 2004. (An Iowa Department of Public Health action step.)

### 6-11.4 Action Step

Implement statewide licensing of plumbing and mechanical tradesmen by July of 2005. (An Iowa Department of Public Health action step.)

### 6-11.5 Action Step

Extend the requirements of the State Plumbing Code to all new construction in Iowa by July 2007. (An Iowa Department of Public Health action step.)

### 6-12 Goal Statement

**Reduce the death rate due to fires to no more than eight deaths per million and reduce the number of injuries due to fires by 30% by the year 2010.**

(Baseline: there are an estimated 12 deaths per million. Source: Office of the Iowa State Fire Marshal).

### Rationale

Third-degree burns require intensive, extended care including skin grafts. The burns are often disfiguring. A child that is burned will require periodic skin grafts to accommodate growth.

The temperature settings on residential hot water heaters are very imprecise. The water temperature may be 10°F more than the thermostat setting even though the heater meets industry standards. Mixing valves are available for showers and other fixtures that will limit the temperature of the water at that fixture. Plumbing codes have required the installation of these valves on showers (120°F maximum) for all types of occupancies since 1994, but there is limited or no plumbing code enforcement outside of larger cities. The valves are not required on bathtubs, lavatories and other sinks.

Several groups bear responsibility for preventing scald burns. Parents and other child caregivers need added knowledge and awareness of the potential for scald burns and the precautions necessary to prevent them. The plumbing trade needs to understand the potential for scald burns and to install hot water heaters and mixing valves in accordance with codes even where codes are not in force. Additionally, the requirement should extend anti-scald valves to all bathroom fixtures.

The plumbing (and mechanical) trade should be held to a single standard statewide. The work of tradesmen affects the health and safety of Iowans not only for scald burns, but also with the proper installation of gas and propane piping and equipment; the installation and repair of heating equipment; the installation of fire suppression systems; and the installation, testing and repair of backflow prevention assemblies.

The United States has one of the highest fire death rates in the industrialized world. At least 80% of all fire deaths occur in residences, according to the Federal Emergency Management Administration (FEMA), United States Fire Administration, 1998.

In 1997, there were an estimated 2,545 residential fires in Iowa that killed 20 and injured an additional 184 people. The estimated cost of these deaths and injuries is \$70 million. Property damage caused by these fires is estimated to be another \$27.1 million, according to the National Fire Data Center.

### 6-12.1 Action Step

Increase the availability and accessibility of reliable and accurate fire safety information that is language and culture sensitive by fully funding a statewide coordinated fire prevention and safety education program targeting residences, schools and providers of child care. (An Iowa State Fire Service Institute and Iowa Department of Public Health action step.)

### 6-12.2 Action Step

Increase to 100% the presence of functional smoke alarms so there is at least one smoke alarm on each livable floor of all inhabited residential dwellings, including basements by 2005; no baseline data are available. (An Iowa Fire Service Institute action step.)

### 6-12.3 Action Step

Recommend that engineers, architects, and contractors offer automatic sprinkler systems as a design option in newly constructed dwellings by 2005; the cost of a sprinkler system in a newly constructed single dwelling is approximately 1 to 2% of the construction cost. (An Iowa Fire Service Institute action step.)

### 6-12.4 Action Step

Initiate a system to differentiate between minority, at-risk immigrant and refugee populations in regard to fire deaths and injuries so a baseline can be established by the year 2005; obtaining information on the number and severity of nonfatal injuries from home injuries is difficult so the National Safety Council suggests that total costs should be estimated on a per-death basis using averages; for example; \$3.5 million from home injuries times each death (20) = \$70 million. (An Iowa State Fire Marshal and Iowa Department of Public Health action step.)

## 6-13 Goal Statement

**Reduce the health risks found in and around Iowa homes by taking a holistic approach and by successfully collaborating with other agencies, programs, and/or departments to unite efforts by the year 2005.** (Baseline: currently being developed.)

## Rationale

The Safe and Healthy Homes initiative is designed to take a holistic and comprehensive approach to dealing with environmental health and safety issues. In the past, environmental issues have been handled by department or program-specific efforts with little to no overlapping or collaboration. Thus, it has been an isolated, fragmented process.

Since the Healthy Iowans 2010 initiative started, committees have formed to deal with these issues. Committee members representing different departments, bureaus, programs and agencies are beginning to see the connections between programs and/or projects, and collaborations are already beginning to occur.

The major environmental concerns to be dealt with in this chapter regarding safe and healthy homes are:

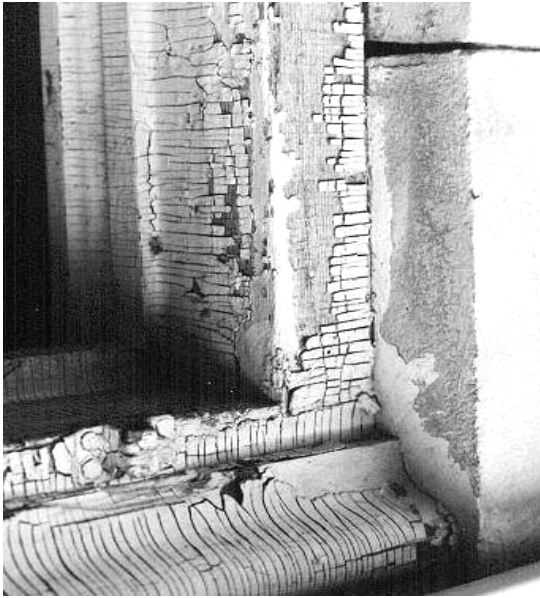
- Indoor air quality, such as radon and carbon monoxide.
- Lead poisoning.
- Asthma environmental triggers.
- Household hazardous waste.
- Fires.
- Hot water burns.
- Private water wells and septic tanks.
- Accessibility to environmental data.

The emphasis in handling environmental issues by the Iowa Department of Public Health has been to provide technical, and in some cases, actual investigations to aid residents, landlords, contractors; and especially local health and housing officials.

The IDPH also has practical solutions. It has helped to identify sources of specific environmental problems, and often has suggested very effective responses when the department's efforts were coordinated with other state agencies, such as the Iowa Department of Natural Resources and local agencies such as housing and environmental health. Each response, however, has been for a specific environmental issue and not for multiple environmental issues.

The safe and healthy homes initiative would allow:

- Education and technical assistance on additional environmental risks in and around the home (holistic approach).
- Coordination of efforts to make better use of the 800 to 1,000 field staff with direct contact with Iowa families (collaboration).



Safe & Healthy Homes Current Data Information by Issue and Situation:

A Summary of Sections in the Chapter

Issue	Situation
Indoor Air Quality Radon	<i>14,000 Lung cancer deaths nationally per year as a result of radon exposure</i>
	<i>71% of Iowa homes may contain radon levels above the EPA recommended action level</i>
Carbon monoxide	203 Iowans died from 1979-1988 from carbon monoxide inhalation
	5,000 are injured nationally from carbon monoxide exposures
Lead poisoning	12.6% of Iowa's children under the age of 6 are lead poisoned
	42.9% of Iowa's housing stock was built before 1950 and contains lead-based paint and potential hazards
Asthma Environmental Triggers	7.1% of Iowans believed to have asthma in 1998

Household Hazardous Waste	2,757 toxic exposures from household hazardous materials in 1998  ~18,200 Tons of household hazardous materials is land filled in Iowa per year
Fires	2,545 residential fires in Iowa in 1997  20 Iowans killed in 1997  184 Iowans injured in 1997
Hot Water Burns	35,000 national scald injury burns per year  100 killed, mostly children <5 and adults >65 years of age
Private Water Wells Septic Tanks	58% of private drinking wells in Iowa are unsafe for drinking  4% of Iowa's population is served by public water that does not meet the safe drinking water standards  25% (350 named communities) of Iowa homes are not served by public sewer systems  175 Iowa communities discharged inadequately treated human sewage to the environment

On April 23, 1997, President Clinton signed an Executive Order on Children's Environmental Health and Safety. Federal agencies dealing with health and safety issues were directed to focus efforts in the following areas:

- Childhood asthma. Recent national data indicate a 40% increase.
- Childhood cancer.
- Developmental disorders (the focus is on lead and mercury).
- Childhood injuries, especially those occurring in the home.

As a result of this order, the Environmental Protection Agency (EPA) Centers for Disease Control and Prevention (CDC), and Housing and Urban Development (HUD) have all taken action. The EPA has established an Office of Children's Health Protection, and both CDC and HUD are A Healthy Homes concept.

In A Healthy Homes project, people who have access to homes where children live are prepared to counsel a family regarding any child health and safety issue related to the home. For example, someone who is investigating a case of childhood lead poisoning would also ask whether a child in the family has asthma and discuss environmental measures for asthma. Or, a nurse who is visiting an at-risk family may observe that there are no smoke alarms in the home and counsel the family about them.

### 6-13.1 Action Step

Establish a core state committee during the year 2000 called the Safe and Healthy Homes Committee with a special focus on childhood concerns, minorities, and those at-risk; it will consist of Iowa Department of Public Health staff who represent various health and safety issues related to the home environment; it would be responsible for:

- identifying all IDPH programs and projects that currently touch these issues or other closely-related issues;
- recommending and coordinating cross training of field staff to deal with environmental risks when visiting a community or home;
- Determining avenues for distributing information regarding issues on safe and healthy homes.

(An Iowa Department of Public Health action step.)

### 6-13.2 Action Step

Establish a state Safe and Healthy Homes Advisory Committee (SHHAC) with representatives from the Iowa Department of Public Health, the Iowa Department of Natural Resources, Iowa Department of Education, Iowa Department of Human Services, Iowa State University Extension, University of Iowa, University of Northern Iowa, local health departments, minority or at-risk populations, and other relevant organizations during the summer of 2000; committee members will have a strong interest in health or safety issues related to the home environment with a special focus on children or the family, and on minority or at-risk populations; this committee would:

- identify what Iowa agencies are dealing with environmental health and safety risks in and around the home;

- determine additional avenues for distributing information regarding safe and healthy homes issues;
- Assist in raising community awareness about issues on safe and healthy homes.

(An Iowa Department of Public Health action step.)

### 6-13.3 Action Step

Develop informational packets that are language and culture sensitive which contain environmental and other health information as well as solutions to problems; field staff will distribute the packets as they visit homes and identify risks by 2001. (An Iowa Department of Public Health and Safe and Healthy Homes Committee action step.)

### 6-13.4 Action Step

Develop a comprehensive brochure that is language- and culture sensitive encompassing the environmental issues covered by the safe and healthy homes initiative by 2002. (An Iowa Department of Public Health, Iowa Department of Natural Resources, Iowa State University Extension, and Safe and Healthy Home Committee action step.)

## 6-14 Goal Statement

**Increase the capability of local boards of health and/or sanitarians to take on core environmental health programs such as water and sewer permit programs, grants-to-counties, and nuisance conditions in all of Iowa's 99 counties by the end of 2010.**

### Rationale

There are very few environmental health professionals in Iowa's rural counties with the capabilities to provide all the services that fall under local board of health responsibilities for environmental health. There is a lack of expertise, experience and/or commitment at the local level to evaluate, assess and offer solutions to environmental health risks. Local boards of health request, on a continual basis, assistance in developing effective methods in evaluating and handling high-risk environmental conditions.

A 1998 IDPH survey of Iowa's Local Boards of Health shows that 73% of the counties in the State of Iowa are not able to provide core environmental health coverage at the local level.

In these counties there is a range of services from none at all to fragmented services, which are unable to fully handle core environmental health issues. There needs to be a more thorough assessment of local environmental health

programs to make further determinations on needs and weaknesses .

Additionally, there is an inability by most state agencies to specifically deal with the needs and requests of local boards of health. There are also emerging concerns and issues that are not directly addressed at the state or local level due to a lack of resources or knowledge.

The first step in achieving the established goal is to have a state-level person devoted solely to providing technical assistance to local boards of health and sanitarians. Technical assistance would include providing guidance on developing and maintaining essential environmental health programs in addition to identification of advanced training needs and/or opportunities. Examples include policy and procedures on selection of personnel, rule making, permit programs, inspection procedures, and collection of fees. It is anticipated that more than a single state-level position is needed to deal with the needs of local programs. Assessments will identify those needs and support the need for additional positions.

The limited orientation program currently offered by the Iowa Department of Public Health, along with the assistance of other state agencies, receives positive feedback. Evaluations of the orientation indicate a need for formally establishing the orientation to handle the growing needs of the participants.

#### **6-14.1 Action Step**

Establish an environmental health circuit rider position within the Iowa Department of Public Health by January of the year 2000, with one full-time equivalent position with a budget line item amount of \$78,850. (An Iowa Department of Public Health action step.)

#### **6-14.2 Action Step**

Complete assessments of 50 county and/or city environmental health programs by 2001, and handle another 49 assessments; to be completed by the environmental health circuit rider by 2002. (An Iowa Department of Public Health action step.)

#### **6-14.3 Action Step**

Increase and promote the availability of formal training opportunities by working with area community colleges, professional associations, state agencies, and other training providers, and annually identify and promote 20 formal training opportunities for local boards of health and sanitarians by the end of December 2005. (An Iowa Department of Health action step.)

#### **6-14.4 Action Step**

Provide an annual formal orientation for newly established environmental health professionals (sanitarians). (An Iowa Department of Public Health action step.)

#### **6-14.5 Action Step**

Create a reporting mechanism to track requests for assistance on environmental risk areas for which there is no program; also, use the data to evaluate and make determinations on the need for resources to cover areas that are not currently being handled. (An Iowa Department of Public Health action step.)

#### **6-14.6 Action Step**

Identify and support during the summer of 2000 the need for an additional environmental liaison position, and establish a second environmental liaison position within the Iowa Department of Public Health by 2002. (An Iowa Department of Public Health action step.)

### **6-15 Goal Statement**

**Reduce pesticide poisonings through the collection and analysis of pesticide poisoning reports and use of data in training programs for pesticide handlers and applicators.**

#### **Rationale**

Pesticides are widely used to control many different types of pests across Iowa. Pesticides provide positive public health results and allow for the production of needed food and fiber. However, accidents with pesticides can pose a threat to health. A need exists to catalog the reports of pesticide exposures that have acute poisoning effects.

The Iowa Department of Public Health is the state lead agency for the collection, maintenance, compilation, and publishing of statewide annual reports and for development of a county-by-county profile of pesticide poisoning reports. The IDPH has established rules to carry out this responsibility.

The IDPH reports pesticide poisonings to the Iowa Department of Agriculture and Land Stewardship. Currently, the Iowa Department of Public Health has not established the needed active surveillance program for toxic chemicals and pesticides.

The Iowa Department of Agriculture and Land Stewardship (IDALS) is the state lead agency for the administration and enforcement of pesticide use in Iowa. Duties include the registration of pesticides; licensing of pesticide dealers; safe handling, storage, and application of

pesticides; certification of handlers and applicators of restricted-use pesticides; and participation with the U.S. Environmental Protection Agency initiative programs related to groundwater protection, endangered species protection, and the worker-protection standard.

IDALS works cooperatively with Iowa State University Extension to conduct training for certified applicators. IDALS is required to report to registrants of pesticides when reports are ready from the Iowa Department of Public Health.

The University of Iowa Department of Preventive Medicine and Environmental Health, the Iowa Center for Agricultural Health and Safety, and the Center for Health Effects from Environmental Contamination have an interest in the adverse human health effects of pesticides.

Knowledge of pesticide poisonings will help to better train the handlers and applicators of pesticides and to advise the registrants of pesticides and the U.S. Environmental Protection Agency of adverse human affects from pesticides.

### **6-15.1 Action Step**

Establish an electronic reporting system and develop criteria for content of reports during 2000. (An Iowa Department of Public Health action step.)

### **6-15.2 Action Step**

Establish a formal program that assures follow-up investigations, studies, assessment of data, reporting of trends, communication with outside agencies and identification of high-risk environmental conditions and exposure by 2002. (An Iowa Department of Public Health action step.)

### **6-15.3 Action Step**

Develop a coordinated, established education program with regulatory actions to prevent high-risk environmental conditions and exposure by 2002. (An Iowa Department of Public Health action step.)

## **6-16 Goal Statement**

**Provide researchers at government agencies, universities and in the private-sector with access to environmental data; a need exists for individuals who are conducting research to have access to various types of environmental data collected from the monitoring of water, air, and soil and/or geologic materials to determine the impact on humans and the environment; environmental policy needs should be based upon the best available scientific information to convince the**

**public of the need to conduct human activities in a prescribed manner.**

## **Rationale**

To make environmental data available to researchers who are conducting evaluations, it is necessary to first discover who is conducting data gathering activities. A network is needed to facilitate the cooperative transfer of data. The Internet has become the fastest and easiest mode of communication. An Internet site that lists basic information on existing research could serve as a starting point to network people with others who have similar research interests.

There are many individual government researchers in agencies and universities in Iowa that are collecting data from their own monitoring and testing projects or from regulated public or private entities. The data may cover water, air, or soil and/or geologic materials.

It is necessary to identify obstructions to sharing scientific information. These may include: data in written but not electronic format; high volume of data, such as municipal drinking and waste water data; differences in software or data management systems; and duplication of data between different agencies or different data bases within an agency.

### **6-16.1 Action Step**

Identify by the year 2000 a government agency to serve as a central hub for a network of environmental staff and researchers; this agency will serve as a host for an Internet site that will provide a brief synopsis of available environmental data provided by participating entities. (An Iowa Department of Public Health and Iowa Department of Agriculture and Land Stewardship action step.)

### **6-16.2 Action Step**

Identify by the year 2000 the type of data and who has the data for water quality issues, with confidential data being specifically identified because it carries specific legal restrictions and may only be made available to authorized individuals. (An Iowa Department of Public Health and Iowa Department of Agriculture and Land Stewardship action step.)

### **6-16.3 Action Step**

Develop a standardized form and catalog the identified data (electronic or written) by 2001; the form will seek to identify quality assurance and/or quality control standards as part of the information. (An Iowa Department of Public Health and Iowa Department of Agriculture and Land Stewardship action step.)

### 6-16.4 Action Step

Publicize the data-sharing network to environmental staff and researchers in the public- and private sector during 2001. (An Iowa Department of Public Health and Iowa Department of Agriculture and Land Stewardship action step.)

### 6-16.5 Action Step

Expand the data index to deal with other parameters such as air, soil, and geologic materials beginning in the summer of 2002 with the Iowa Department of Agriculture and Land Stewardship's Pesticide Bureau coordinating this effort; subcommittee members will be involved in identifying research data and assisting in development of action steps. (An Iowa Department of Public Health and Iowa Department of Agriculture and Land Stewardship action step.)

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