11. Environmental Health

Goal:
To ensure all Alaskans have access to safe water and food and live in healthy communities.

	Indicator	Alaska Data Source	U.S. Baseline	Alaska Baseline	Alaska Target Year 2010
	Health Goal for the Year 2010: To ensure all Alaskans have access to safe water and food and live in healthy communities.				
1	Decrease number of "boil water" notices issued, the population affected, and the duration of the notice.	DEC, Division of EH Drinking Water and Wastewater Program		32 notices 3,444 people affected 4.1 days average duration (2000)	75% decrease all three measures
2	Increase the percent in Class A & B public water systems in compliance with EPA established health-based standards.	DEC, Division of EH Drinking Water and Wastewater Program	73% of persons served by community systems (1995)	93% of the larger public water systems (Class "A" & "B") (2000)	95%
3	Decrease the percentage of sanitary surveys with findings of significant compliance violations.	DEC, Division of EH Drinking Water and Wastewater Program		16% (2000)	5%
4	Increase the percentage of landfills with a permit or an alternative to a permit.	DEC, Division of EH Solid Waste Program		33% (2000)	50%
5	Decrease improper pesticide, herbicide, fungicide, and rodenticide use, storage, and disposal. Increase pesticide safety awareness.	DEC, Division of EH Pesticide Services	Developmental School Health Policies and Programs Study	Commercial pesticide applicators were not required to keep accurate general-use pesticide treatment records.	Increase the percentage of commercial pesticide applicators maintaining accurate required records of general-use pesticide treatments.
				3.6% of the school districts have a written Integrated Pest Management Policy	50%
6	Increase the percent of landfills inspected. Increase the percent of landfills with an inspection score of 80 or higher.	DEC, Division of EH olid Waste Program		31% inspected 49% scored 80 or higher (2000)	85% inspected 80% score 80 or greater
7	Increase the number of communities with access to safe water and proper sewage disposal.	DEC, Facility Construction and Operation Division Governor's Council on Rural Sanitation.		88% (2000)	98%
8	Decrease the number of oil spills greater than one gallon.	DEC, Spill Prevention and Response Division		1,854 (FY 2000)	Developmental*

	Health Goal for the Year 2010: To ensure all Alaskans have access to safe water and food and live in healthy communities.				
	Indicator	**Alaska Data Source**	**U.S. Baseline**	**Alaska Baseline**	**Alaska Target Year 2010**
9	Decrease the number of hazardous substance spills.	DEC, Spill Prevention and Response Division		402 (FY 2000)	Developmental*
10	Decrease the average environmental hazard per contaminated site.	DEC, Spill Prevention and Response Division		756 "high", 602 "medium", 466 "low" and 219 "unranked" contaminated sites	Projected Completion of over 400 high, 600 medium, and 1000 low priority sites made up of current and future sites
11	Increase the number of underground storage tank owners issued "no further action" letters during the year.	DEC, Spill Prevention and Response Division		124 (FY 2000)	Fewer "no further action letters" will be required with full implementation of UST spill prevention rules
12	Reduce the number of times Alaskan cities do not meet the US EPA's standards for carbon monoxide.	DEC, Air and Water Quality Division		2 (Fairbanks, 1998) 3 (Fairbanks, 1999)	0
13	Increase the number of impaired water bodies with confirmed pollution that have been restored.	DEC, Air and Water Quality Division		Developmental*	

*There is an effort to get more complete reporting data in the future so that setting a target would be more meaningful.
DEC - Alaska Department of Environmental Conservation
EH - Environmental Health
EPA - Environmental Protection Agency

11

Overview

The quality of Alaska's air and water are unrivaled in the nation. Cooperation among state and local governments, tribal health organizations, citizens, and industry is crucial to environmental protection. A healthy community has safe drinking water, clean air, effective waste management, and proper pesticide use.

Issues and Trends in Alaska

Environmental Health Resources in Alaska

The Alaska Department of Environmental Conservation (DEC) protects Alaska's air and water quality, monitors oil and hazardous substances, oversees solid waste management, enforces environmental laws, and educates industry and the public about environmental issues and hazards.

DEC developed a community action manual for village environmental issues in partnership with the village of Chugachmiut. Seven Generations was published in 1999. The manual helps village residents identify and prioritize environmental issues within their own communities.

The Division of Public Health's Environmenta Health Program evaluates risks to human health associated with the presence of hazardous substances. The program conducts blood lead surveillance, follows up on health care provider reports of hazardous substance events, evaluates the safety of subsistence foods, and provides consultation and public information on environmental issues.

The Alaska Native Tribal Health Consortium's Department of Environmental Health and Engineering (DHES) constructs water, wastewater, and solid waste disposal systems in more than 109 Native communities. Over 6,000 of the 16,600 Native homes eligible for service have no running water or sewer. In FY 00, DHES started 103 new sanitation projects with a total value of $69 million dollars and provided emergency assistance to Elim, Kiana, Minto, Noatak, Russian Mission, and St. Paul.

The Municipality of Anchorage's Environmental Services Division focuses on air and water quality and public facility sanitation. The Customer Service Section, Air Quality Program, I/M Vehicle Inspection Program, and the Environmental Sanitation Program all provide public health education, as well as code enforcement.

The Governor's Council on Rural Sanitation was established in 1995 to develop a comprehensive plan for safe water and adequate sewage disposal for rural Alaskans. Representatives of statewide and regional Native organizations, state and federal officials, sanitation experts, local government officials and members of the public collaborated on the Rural Sanitation 2005 Action Plan, a blueprint for rural sanitation infrastructure.

Food service inspections, investigation of food-borne diseases, and the regulation of food industries are discussed in Chapter 12.

Safe Water

According to the 1990 census, 66 percent of households in Alaska were served by a public water system, 24 percent used wells, and 10 percent used some other acceptable method. Of these, 90 percent used a safe drinking water source. Of the households with acceptable drinking water sources, groundwater is delivered to 400,000 Alaskans by 3,062 public water systems or private wells. Over 238,000 people rely on surface water delivered by 469 public water systems.[1] Regardless of source, the majority of Alaska's public water systems (95%) serve fewer than 500 persons.

An important component in protecting public health is the availability of safe water in the home. Although most urban Alaska residents have an abundant supply of running water in their homes, many rural Alaskans do not. Approximately 31 percent of rural Alaska households lack plumbing, and residents must haul water from watering points or washeterias to their homes where it is stored in containers (often, open buckets). To conserve water, family members may share the same basin of water for all their washing needs. Washing in a dirty basin of water can spread disease from one family member to another.

Alaska has an estimated 365,000 miles of rivers and approximately three million lakes that cover about 12,787,200 surface acres and 33,203 square miles. Fifty-eight water bodies have been identified as impaired because they have unsafe pollution levels. The most common pollution is from urban-related sources such as leaking septic systems, dog waste, and runoff from city streets carrying dirt and oil. The second largest pollution source in Alaska is related to timber harvesting, primarily from log transfer facilities
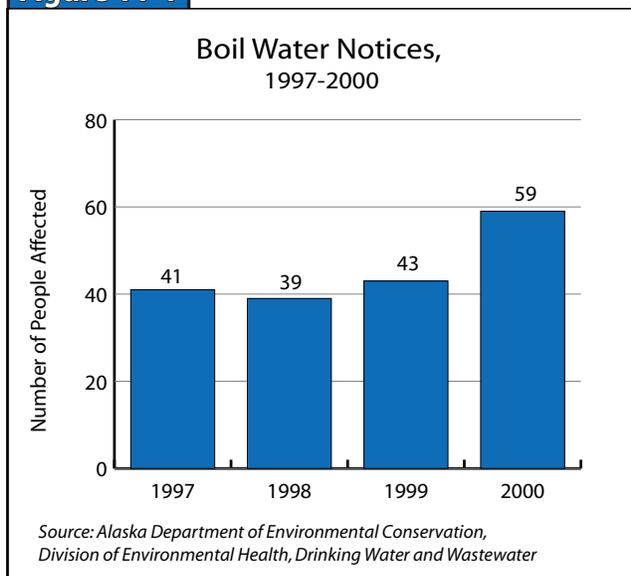
in Southeast marine waters.[2] Thirteen water bodies were removed from the list of polluted water bodies in 1996; however, 16 new ones were added in 1998.

Public Water Supply

Drinking water served by public water systems in Alaska is generally of high quality. In some circumstances, the water exceeds allowable levels of contaminants (coliform bacteria, chemical contaminants, or the treatment standard established for surface water). Notices to boil water are issued when public water supplies exceed the public health standards for fecal coliform. Fecal coliform indicates a water system is being contaminated by sewage. Testing for fecal coliform is the most routine and least expensive analysis performed by public water systems. Eighty-five percent off compliance sampling done by public water systems is for fecal coliform.
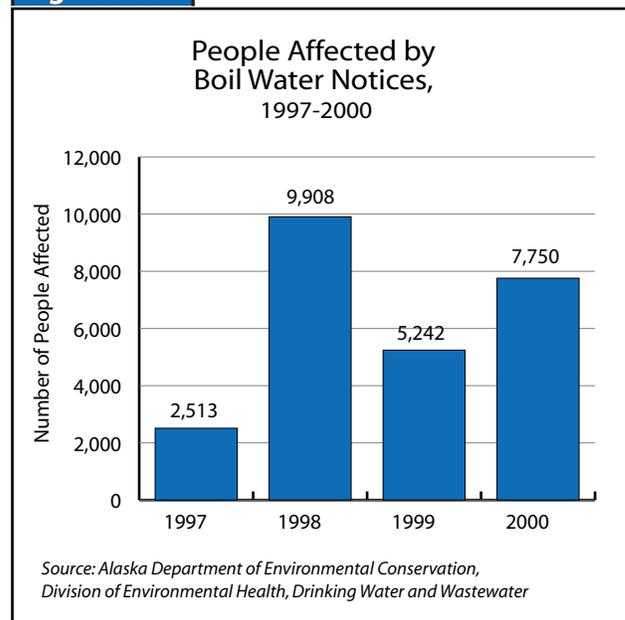
Three indicators of water quality are the number of boil water notices issued (Figure 11-1), the population affected (Figure 11-2), and the length of the boil water notice. In 1999, the average number of days of the boil water notice was 10.3 days and in 2000 it was 13.8 days.

Figure 11-1

Boil Water Notices,
1997-2000

Source: Alaska Department of Environmental Conservation, Division of Environmental Health, Drinking Water and Wastewater

A sanitary survey is required of all public water systems that are federally regulated under the Total Coliform Rule. A public water system may be in violation when a sample does not meet state standards or when a required measurement or sample has not been taken. Ninety-three percent of Alaska's larger public water systems (Class "A" and "B") are in compliance with EPA established health-based standards.

Figure 11-2

People Affected by
Boil Water Notices,
1997-2000

Source: Alaska Department of Environmental Conservation, Division of Environmental Health, Drinking Water and Wastewater

Safe Air

Air pollution has been linked to a variety of health problems, including the respiratory diseases described in Chapter 24. Particulate matter can cause or exacerbate diseases such as emphysema, bronchitis, and asthma. Coarse particles (10 microns in diameter - PM10) and fine particles (2.5 microns in diameter - PM2.5) are currently regulated. (The PM2.5 standard is currently under litigation). In Alaska, PM10 typically comes from windblown dust (glacial silt), volcanoes, and dirt roads. PM2.5 is man made and comes from wood burning stoves, open burning, home heating, and diesel and gas vehicles. Three areas in Alaska historically have problems with particulates: Juneau's Mendenhall Valley, Eagle River in the Municipality of Anchorage, and the Matanuska-Susitna Valley.

Alaska's cold climate contributes to air pollution problems, especially carbon monoxide levels. Approximately 80 percent of the winter carbon monoxide in cities is from vehicle emissions. Anchorage and Fairbanks have failed to achieve the air quality standard for carbon monoxide. To be eligible for redesignation, each city must not exceed the standard for two years. Anchorage meets the requirements but has not been redesignated yet since a new air quality plan hasn't been developed.
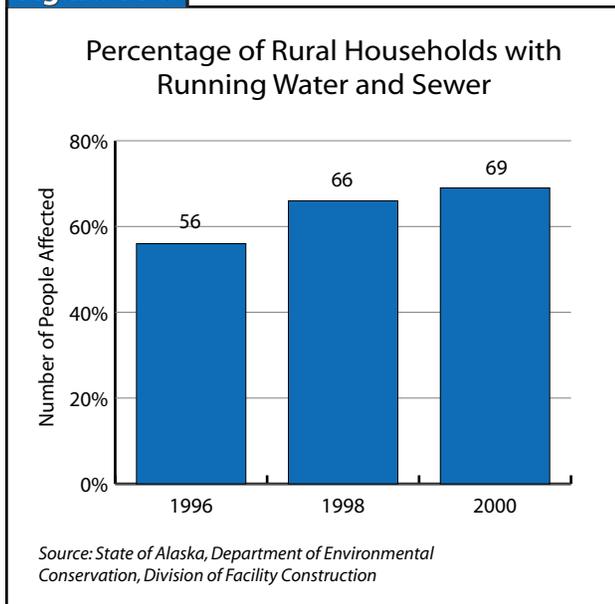
11

Healthy Communities

Access to Water and Sewer

The percentage of rural households with access to running water and sewer systems increased from 56 percent in 1996 to 69 percent in 2000 (Figure 11-3). By December 2003, it is projected that 84 percent of rural households will have access to running water and a sanitary means of sewage disposal.

Figure 11-3

Percentage of Rural Households with Running Water and Sewer

Source: State of Alaska, Department of Environmental Conservation, Division of Facility Construction

The 1990 United States' census found that 62 percent of all Alaskan housing units were connected to a public sewer system and 25 percent used on-lot septic tanks. Therefore, 88 percent of all households had access to an adequate sewage treatment system. The remaining 12 percent used an alternative, such as honey buckets. A honey bucket is a container that is placed in the house and used as a toilet. Once the bucket is full, it is hauled to a designated spot, emptied and carried back to the house. Creating acceptable sewage systems for every Alaskan and making honey buckets obsolete are state priorities.
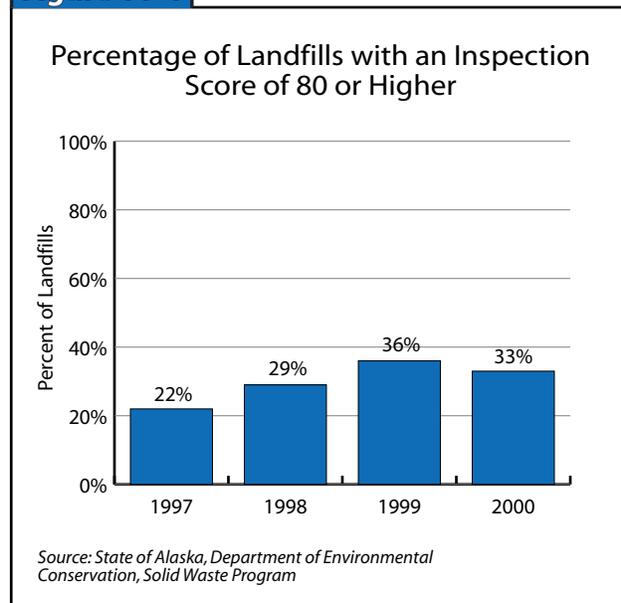
Solid Waste

Alaskans generate about 1,300 tons of household garbage each day, nearly twice the national average per person. Seventy-eight percent is disposed of in landfills or shipped to landfills in the lower 48, 15 percent is incinerated, and 7 percent is recycled. DEC regulates 451 landfills: 146 are non-municipal (industrial) facilities that handle materials like drilling wastes, mine tailings, and construction wastes; 271 are municipal landfills, of which 10 serve large communities; 21 service medium-sized towns; 44 serve industrial or government camps; and 196 serve small villages. State law requires that anyone who conducts an operation that results in the disposal of solid waste into the waters or onto the land have a permit.

Alaska's eight largest communities, which produce 75 percent of the waste, use solid waste facilities that meet comprehensive requirements for the design and operation of landfills. However, only one-quarter of the rural communities have properly designed and operated solid waste facilities. Substandard landfills can result in contaminated surface and groundwater, animal foraging, and windblown litter over the surrounding landscape. In order to prevent landfills and dumps from damaging the environment, standards have been established to ensure they are designed, maintained, and operated appropriately.

All landfills are required to have a permit or some form of acceptable alternative in order to operate. At the end of 2000, 91 active landfill sites out of 271 (33%) had a current permit or an acceptable alternative (Figure 11-3). This is an increase from calendar year 1997 when only 22 percent of landfills held permits.

Figure 11-4

Percentage of Landfills with an Inspection Score of 80 or Higher

Source: State of Alaska, Department of Environmental Conservation, Solid Waste Program

Landfill facilities are inspected to determine if they are handling waste in accordance with their permits and with the department's solid waste regulations.

Over the past four years, the percentage of Class III community landfills (landfills disposing of less than 5 tons daily or 1 ton of incinerated ash) that have been inspected has ranged from a low of 4 percent to a high of 100 percent.

Permitted landfills, as well as unpermitted dumps, are inspected. At the end of 2000, DEC had inspected 31 percent of the municipal landfills and 49 percent had a score of 80 or higher. This compares with calendar year 1997, when the department inspected approximately 10 percent of the permitted landfills and just 27 percent had a score of 80 or above (Figure 11-4).

Contaminated Sites

DEC ensures that contaminated sites are evaluated and cleaned up in priority order, based upon risk to human health and the environment. Currently there are over 2,000 sites considered contaminated. Over 500 of these are identified as "high priority" sites based upon the Alaska Hazard Ranking Model. In most cases, DEC oversees companies, federal agencies (such as the Department of Defense), or individuals who are cleaning up contamination found on their property. Occasionally, DEC will take charge of site cleanup when a responsible party cannot be identified or is unable to act.

Annual contaminated site clean-up completion rates have more than doubled over the last ten years. DEC has taken a number of steps to accelerate the rate of cleanup completions. In 1999, DEC promulgated new cleanup regulations that allow contaminated site cleanups to be proportional to the risks posed to human health, the environment, and the intended land use. The use of "institutional controls" as a tool to expand risk-based cleanups can reduce the time and costs associated with cleanups. DEC has also expanded the Voluntary Cleanup Program (VCP) for low and medium priority sites to enable many sites, including underground storage tank sites, to be cleaned up under a streamlined process with minimal oversight. DEC focuses resources on large facilities that have multiple high priority sites, such as the former United States Navy facility on Adak Island. This approach allows simultaneous assessment and clean up of multiple sites in an area.

Many above ground storage tanks (ASTs), especially in rural Alaska, are in poor condition and are improperly maintained and operated. Many have leaked fuel to land and waterways, and some have contaminated drinking water sources. The rising cost of containing and cleaning up spills from leaking tanks has increased attention to this problem. DEC is currently working with the Alaska Energy Authority to develop new AST facilities and to clean up old spills. Additionally, DEC provides tank farm operator training courses in over 25 villages a year, ensuring village residents are trained in spill response should a release occur.

Underground storage tanks (USTs) pose a similar risk in urban parts of Alaska. DEC has supervised the cleanup and closure of over 1,000 leaking UST sites, many of which impacted groundwater. More cleanups are currently underway. Periodic inspection and testing of all USTs is now required to ensure that they are safe and leak-free.

Oil Spill Prevention

DEC's goal is to prevent spills from producers, transporters, and distributors of petroleum products and to support privately run spill response in Alaska's industrialized areas. Alaska law requires the oil industry to prevent spills, have financial ability to clean up a spill, and have a discharge prevention and contingency plan. These requirements apply to terminals and distributors of crude and refined oil products, marine tankers and barges that transport oil products, pipelines, and oil exploration and production facilities. In 2000, three new prevention and response tugs with the best available technology were acquired for Prince William Sound.

In the fall of 2000, non-tank vessels (vessels that are self-propelled, haul fuel only for their internal use and are over 400 gross tons) were required to demonstrate financial responsibility for oil spill cleanup. In April of 2001, the requirement for non-tank vessels to have contingency plans and a response infrastructure was signed into law. Regulations are being adopted to implement this requirement.

Companies develop corrective action plans to address deficiencies identified in inspections, audits, and drills. To identify problems, DEC continually offers training, demonstrations, and numerous drills across the state. Drills are full-scale events organized in partnership with industry and have been conducted in Prince William Sound, the Beaufort Sea, and Cook Inlet.

Unfortunately, even with extensive prevention, spills still occur. In 2000, 2,311 spills were reported to DEC and 799 site visits were conducted. Effective cleanup and restoration of the environment occurred at over 65 significant spills. DEC completed 49 contaminated

11

site cleanups, 11 of which were under the Voluntary Cleanup Program.

Pesticides

Pesticides are used in Alaska in urban, rural, and industrial areas. During 2000, 970 applicators were trained and certified in 14 categories to use pesticides commercially on farms and to sell restricted-use pesticides. Of the 3,112 pesticides registered for sale in Alaska, 863 are classified as dangerous based on toxicity. Through training, outreach and inspections, DEC is reducing the risk of exposure to pesticides and contamination of the environment.

Having accurate records available for examination verifies where and how pesticides have been purchased and used. Commercial pesticide applicators are not required by law to keep general-use pesticide treatment records. Records are available only for restricted-use pesticide sales, purchases, and uses. New regulations will require accurate record keeping for all general-use pesticide treatments by commercial applicators.

Current Strategies and Resources

In order to continue to see a decrease in the number of Boil Water Notices, their duration, and the population affected DEC will:
- continue to work with engineers and others to ensure domestic wastewater systems are properly designed and installed;
- work with property owners and utility managers to ensure domestic wastewater systems are properly maintained;
- work with public water systems to ensure water system operators are properly trained for the collection of water samples; and
- work with public water system operators to ensure the disinfection methods for the water system are appropriate and properly functioning.

In order to achieve a decrease in the number of public water systems whose sanitary surveys show significant compliance violations, DEC will:
- work with system operators to ensure each public water system is managed by a certified operator;
- continue to provide assistance to water system operators, directly and through the Remote Maintenance Worker program and the National Rural Water Association on how the water treatment process works and the system's maintenance needs.

In order to increase the percentage of landfills with a permit and an alternative to a permit, DEC will:
- develop general permits for landfills that serve small camps and villages (Class III landfills);
- significantly streamline permitting processes in-house through developing standard permit formats and language and reducing the detail in the permit document, relying instead on the language of the regulation and the permit application; and
- develop permits-by-rule.

In order to accomplish the goal of improving how waste is handled and disposed, DEC will:
- increase the number of inspections by using staff time that is freed up as a result of streamlining the permitting processing with a target of inspecting 25 percent to 35 percent of all permitted landfills annually;
- provide solid waste training to operators with an emphasis on rural landfill operations;
- increase the focus on solid waste handling options with communities; and
- increase the percentage of Class III community landfills that are inspected, and decrease the percentage of Class I and Class II community land fill inspections except for those facilities with compliance problems.

Access to running water and sewer is essential for public health. To ensure these essential services, DEC is:
- securing federal grant funds for rural sanitation projects;
- awarding grants to rural communities with capacity to operate and maintain sanitation utilities for planning, design and construction of water and sewer systems;
- working directly with rural communities to plan and construct water and sewer systems that can be operated and maintained locally; and
- providing training and technical assistance to rural sanitation utility operators.

DEC is working to prevent hazardous substance spills through prevention, technical assistance, and and public outreach and educational approaches. The department is expanding and maintaining statewide hazardous spill response capabilities through joint training, drills, equipment testing, and technical assistance to industry about safe handling and use of hazardous substances. DEC is also working to prevent oil spills through the implementation of a prevention plan. The plan includes risk reduction measures, technical assistance, legal action, and public outreach and educational approaches; educates commercial fuel

tank owners and operators in proper spill prevention and response methods and technologies; and provides technical assistance to tank owners and operators to ensure compliance with federal regulations.

DEC is working to characterize and rank all known contaminated sites in the state. The goals are to assess and cleanup the highest risk sites, to ensure that the work is done by responsible parties that apply measurable standards, and to contract with private specialists to assess and clean up state-owned and "orphan" sites. The department is also expanding the Voluntary Clean-Up Program, which includes regulated underground storage tanks, to increase the rate of cleanup of lower priority sites with reduced government oversight.

DEC has adopted the federal regulatory program for Underground Storage Tanks and added financial assistance and tank worker and inspector elements. The program's goals are to clean up current petroleum spills and prevent new spills from happening. Approximately 44 percent of over 2,100 UST petroleum spills have been cleaned up and made available for economic reuse. DEC has also increased the annual rate of "No Further Actions" from 80 to over 100 by ensuring that each site is assigned to a designated staff person and by working on the sites based on hazard ranking. Sites of low rank can be expedited by processing through the Voluntary Clean-Up Program.

During 1997-99, Anchorage met the health standard benchmark for air quality. Violations may still occur. In 1999, Fairbanks exceeded the air standard three times. DEC is working closely with Fairbanks Borough, Municipality of Anchorage and EPA to develop plans to further improve air quality.

Through the Alaska Clean Water Action Plan, DEC is developing individual water-body recovery plans and institutional control programs to help impaired water bodies recover and to restrict others from becoming impaired. DEC started to formally track this measure. In a typical year, at least two waters are identified as restored.

Data Issues and Needs

Currently, there is limited information in Alaska on indoor air quality in homes, schools, and workplaces. Air pollutants such as radon, asbestos, and heating fuel can have adverse health effects, and having baseline information would be useful to help determine the extent of the problem in Alaska. Furthermore, greater data integration regarding health problems, such as asthma rates and outdoor/indoor air pollution levels, is needed.

More complete information regarding the existence of local and global sources of persistent pollutants is essential. Data on the levels of persistent organic pollutants in subsistence foods and the people who eat them would also be helpful to determine the safety of the food supply.

Research is needed on the pipes currently used to transport fuel throughout the state. Many are aging and prevention of spills will depend on data to find faulty pipes before they break. Information about the disposal of different types of wastes and feasible alternatives for certain waste streams can help alleviate the concentration of large amounts of waste that could be disposed of through other means.

Related Focus Areas

A variety of objectives in other *Healthy Alaskans* chapters are linked to objectives in *Environmental Health*.

- *Food Safety*
- *Immunization and Infectious Diseases*
- *Heart Disease*
- *Cancer*
- *Respiratory Diseases*

Food Safety and Environmental Health are closely related. Foodborne diseases are linked to environmental factors, such fecal contamination water supplies or food processing plants. Outbreaks of communicable diseases discussed in the *Immunization and Infectious Diseases* chapter can be caused by contamination of food and water supplies. Coronary heart disease and respiratory diseases are exacerbated by air pollution. Pesticides and toxins in the environment increase cancer risks.

Endnotes

[1] DEC, Division of Environmental Health, Drinking Water and Wastewater Program
[2] DEC, Air and Water Quality Division

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