ALBUQUERQUE, NM

Albuquerque Earned a Water Quality and Compliance Grade of Poor for 2000 and 2001

City tap water has significant problems with arsenic and radon.

▶ In many parts of the city's water system, current levels of **arsenic,** a known and potent human carcinogen, exceed the new national arsenic standard (adopted in 2001, enforceable in 2006). Levels in arsenic in the city present a fatal cancer risk, according to National Academy of Sciences, estimates—more than 40 times higher than what the EPA generally considers acceptable.

▶ In some areas of the city, levels of **radon,** a radioactive gas known to cause lung cancer, exceed the proposed national radon standard. While Albuquerque may eventually qualify for a waiver of this standard, this radon level presents a significant cancer risk.

▶ A few **other contaminants** were found in city water, sometimes at levels above national health goals for tap water but below enforceable standards. These included:

- **gross alpha radiation,** known to cause cancer
- **thallium,** which can cause damage to nerves, liver, kidney, intestines, and testicles
- **total coliform bacteria,** microbial contaminants whose presence is a potential indicator that disease-causing organisms may be present in tap water
- **fecal coliform/*E. coli*,** a subset of total coliform bacteria that can be a sign of human or animal wastes in tap water
- **total trihalomethanes,** by-products of chlorine disinfection that may cause cancer, miscarriages, and birth defects
- **haloacetic acids,** by-products of chlorine disinfection that may cause cancer

ALBUQUERQUE
System Population Served **445,000**[1]
Water Quality and Compliance **2000▶Poor** **2001▶Poor**
Right-to-Know Report—Citizenship **2000▶Fair** **2001▶Good**
Source Water Protection **Poor**
REPORT CARD

Albuquerque's Right-to-Know Reports Earned Grades of Fair for 2000 and Good for 2001

▶ The reports were user-friendly and included important information on radon in the water supply. However, the reports, particularly in 2000 with respect to arsenic, understated the significance of some problems with the city's water.

Albuquerque Earned a Source Water Protection Grade of Poor for 2000 and 2001

▶ The city's groundwater is becoming seriously depleted, and various contaminants, including those from Superfund sites in and near the city, are problems.

KEY CONTAMINANTS IN ALBUQUERQUE'S WATER

The following contaminants have been found in Albuquerque's drinking water supply. For more information on health threats posed by specific contaminants, see Chapter 5.

MICROBIOLOGICAL CONTAMINANTS

Total Coliform Bacteria[2]

National Standard (MCL)
5% maximum in any month[3]

National Health Goal (MCLG)
0—no known fully safe level

2000 Levels
1% in highest month, total coliform positive

2001 Levels
1% in highest month, total coliform positive

LEVELS PRESENT SOME CONCERN

Fecal Coliform/E. coli

National Standard (MCL)
0 confirmed fecal coliform/*E. coli*

National Health Goal (MCLG)
0—no known fully safe level

2001 Levels
2 samples (of 2,550) positive for fecal coliform/*E. coli*—neither confirmed on retest

Total coliform bacteria are microbial contaminants whose presence is a potential indicator that disease-

causing organisms may be present in tap water. On rare occasion, coliform bacteria are found in Albuquerque's water. The highest reported level in any month was just less than 1 percent, meaning that 1 percent of samples taken were found to contain total coliform bacteria. The federal standard allows up to 5 percent total coliform–positive samples per month. The health goal for any type of coliform bacteria is 0.

Fecal coliform and *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes containing germs that can cause diarrhea, cramps, nausea, headaches, or other symptoms; they may pose a special health risk for infants, young children, and people with severely compromised immune systems. In two cases in 2001, fecal coliform or *E. coli* were found in taps serving the city's water; however, neither finding was duplicated in subsequent retests, so the water reportedly did not violate the standard.

No other evidence of a serious bacteria problem in Albuquerque's water has emerged. Total coliform's presence in the city's pipes, however, may be an indication of possible regrowth of bacteria in the distribution system that could signal future problems if not addressed with aggressive operational controls and possibly with pipe rehabilitation or replacement.

INORGANIC CONTAMINANTS

Arsenic

National Standard (MCL)
50 ppb (average) effective through 2005
10 ppb (average) effective in 2006

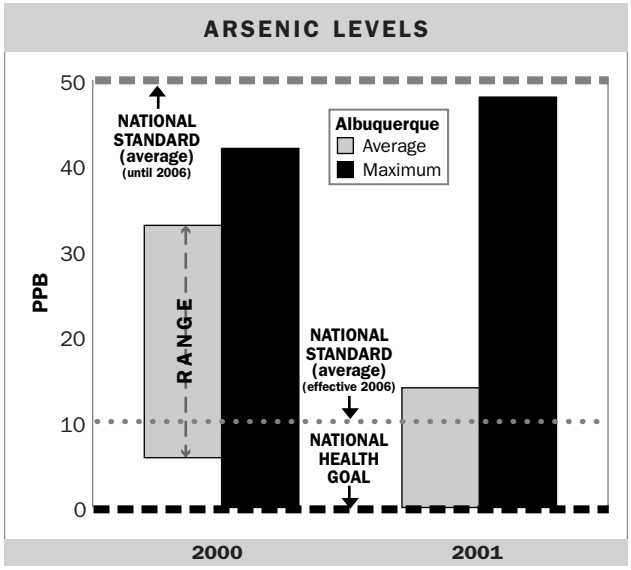
National Health Goal (MCLG)
0—no known fully safe level

2000 Levels[4]
Average: 6–33 ppb, depending on area of city
Range: nondetectable to a high of 42 ppb

2001 Levels[5]
Average: 14 ppb; in some areas, the average is higher; in others, lower
Range: nondetectable to a high of 48 ppb

LEVELS PRESENT HIGH CONCERN

Arsenic—the product of mining, industrial processes, past use of arsenic-containing pesticides, and natural leaching or erosion from rock—is a known and potent human carcinogen that has been linked to a variety of other diseases. The National Academy of Sciences has



estimated that a person who drinks two liters of water a day containing 14 ppb of arsenic (Albuquerque's average level) has a lifetime fatal total cancer risk of about 1 in 220.[6] That risk is more than 40 times higher than what the EPA traditionally allows (1 in 10,000 cancer risk). Albuquerque has long known it has a problem with arsenic but fought against the EPA's efforts to set a safer standard for this known cancer-causing contaminant. Albuquerque, in fact, was one of only two big cities in the United States—the other was El Paso, Texas—to sue the EPA in 2001 when the agency reduced the standard for arsenic to 10 ppb; that suit is still ongoing, but Albuquerque backed out of the case in late 2002. Albuquerque does not mention its suit or fight against the EPA's arsenic standard in the 2001 right-to-know report to its citizens.

ORGANIC CONTAMINANTS

Haloacetic Acids

National Standard (MCL)
60 ppb (average) effective in 2002; no previous standard

National Health Goal (MCLG)
0—no known fully safe level[7]

2000 Levels[8]
Maximum: 16 ppb
Average: 3 ppb

LEVELS PRESENT SOME CONCERN

Haloacetic acids (HAAs), by-products of chlorine disinfection, may cause cancer and, potentially, reproductive and other health problems.[9] The highest

level reported by Albuquerque in 2000 (16 ppb) does not approach the levels at which preliminary studies have suggested links to miscarriages or fetal development problems.

Total Trihalomethanes

National Standard (MCL)
100 ppb (average) effective through 2001
80 ppb (average) effective in 2002

National Health Goal (MCLG)
0—no known fully safe level[10]

2000 Levels[11]	Average	Maximum
	5–7 ppb	26 ppb (2000)[12]

LEVELS PRESENT SOME CONCERN

Total trihalomethanes (TTHMs)—contaminants that result when chlorine is used to treat drinking water and then interacts with organic matter in the water—are linked with cancer and, potentially, to miscarriages and birth defects. The highest level reported by Albuquerque in 2000 (26 ppb) does not approach the levels at which preliminary studies have shown links to miscarriages or fetal development problems.

RADIOACTIVE CONTAMINANTS

Radon

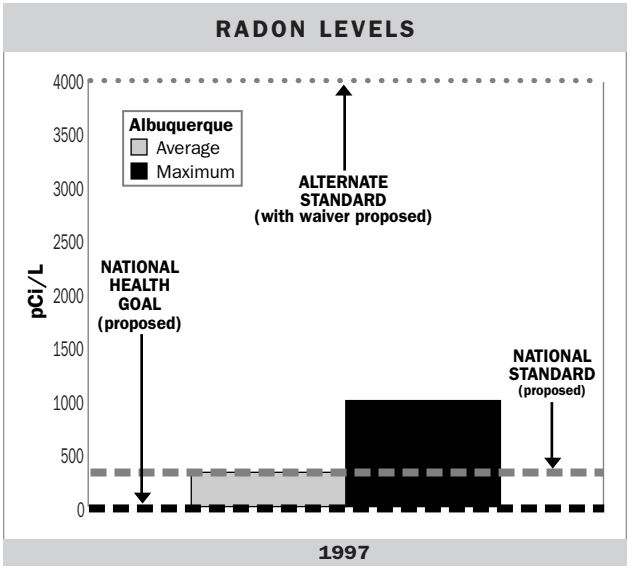
National Standard (MCL) (proposed)
300 pCi/L (average)
Alternate MCL of 4,000 pCi/L where approved multimedia program is in place (average)

National Health Goal (MCLG) (proposed)
0—no known fully safe level

1997 Levels (most recent data reported)[13]	Average	Maximum
	321 pCi/L system-wide 149–605 pCi/L depending on location in city[14]	992 pCi/L

VIOLATION OF PROPOSED STANDARD

Radon, which results from the natural radioactive breakdown of uranium in the ground, is a radioactive gas known to cause lung and internal organ cancers. Radon levels in some areas of the city exceed the EPA's proposed radon standard, which is not yet finalized. Albuquerque has indicated it will ask for what amounts to a waiver of the proposed standard, taking advantage of a provision setting a much weaker standard for cities with indoor air radon programs (called "multimedia mitigation" programs) in place. While generally radon



is a bigger health concern when it presents itself as gas seeping in from basements, the presence of radon in Albuquerque's drinking water is significant and presents a health risk. According to National Academy of Sciences' estimates, the cancer risk of drinking and showering in water containing 300 pCi/L of radon—a level that is less than average in Albuquerque—is about 1 in 5,000, which is twice the EPA's usual maximum acceptable cancer risk.[15]

OTHER CONTAMINANTS

A few other contaminants were found in city water, sometimes at levels above EPA health goals for tap water but not above enforceable standards. These included:

▶ **Thallium**, a trace metal that can cause damage to nerves, liver, kidney, intestines, and testicles, was found at a high of 1 ppb and an average below detection, compared to the national standard of 2 ppb and the national health goal level of 0.5 ppb.

LEVELS PRESENT SOME CONCERN

▶ **Gross alpha radiation**, known to cause cancer, was found at an average of 3 pCi/L and a of high 6 pCi/L, compared to the national standard of 15 pCi/L and national health goal of 0.

LEVELS PRESENT SOME CONCERN

▶ **1,1-dichloroethane**, an industrial solvent and degreaser, was found at a low level (0.5 ppb) in a city well near the San Jose Superfund site. The city reports that it is

conducting frequent monitoring of the well due to its proximity to the Superfund site. There is no standard for this chemical in tap water.

LEVELS PRESENT SOME CONCERN

ALBUQUERQUE'S RIGHT-TO-KNOW REPORTS

Albuquerque's right-to-know reports earned grades of Fair for 2000 and Good for 2001.

On the good-citizen side of the ledger:

▸ The format of the reports and their tables was relatively user-friendly.

▸ They included maps showing the source water and what areas receive water of various qualities.

▸ They revealed information on unregulated contaminants found in the city's water, including revealing detections of **1,1-dichloroethane** in a well near the San Jose Superfund site.

▸ They admitted the presence of radon and that it is a known human carcinogen.

▸ They included useful information on source water protection, system rehabilitation, and treatment.

▸ They included some information translated into Spanish.

On the could-be-a-better-citizen side of the ledger:

▸ The 2000 right-to-know report, published in 2001, downplayed arsenic's cancer risks, incorrectly asserting that "at present, no studies of low levels of exposure have indicated a health hazard exists."[16] In fact several studies, National Academy of Sciences reports, published risk assessments, and EPA health assessments have found that arsenic at low levels of exposure presents serious health risks. The same Albuquerque report also incorrectly asserted that "Congress is now considering repealing the new [arsenic] standard."[17] Quite the contrary was true: Congress voted in 2001 to block the EPA from weakening the new 10 ppb arsenic standard. Albuquerque's report for 2001, issued in 2002, did not repeat these incorrect statements.[18]

▸ The supplier did not mention the lawsuit the city filed in 2001 against the EPA when the agency set a safer standard (10 ppb) for arsenic, nor did it mention Albuquerque's long fight against the EPA's adoption of that standard.

▸ The 2000 report stated, "When you drink Albuquerque tap water, you're drinking high quality water."[19] In fact, Albuquerque's water contains more arsenic and radon than pending or proposed EPA standards allow. The 2001 report did not repeat this statement; rather, it simply asserted that city water meets and always has met all current state and federal drinking water standards.[20]

▸ While both years' reports commendably included a map of the aquifer serving the city, neither one included any map or other specific information providing the names of pollution sources that may threaten Albuquerque's water supply. EPA rules require the reports to reveal known sources of pollutants in city water, such as factories or Superfund sites.

▸ The reports also did not provide information on the health effects of some contaminants found at levels below EPA standards but of potential health concern. These included thallium, radionuclides, and disinfection by-products. Although not legally required, this information would have assisted residents to protect their health and to fight for better protection of their water.

THREATS TO ALBUQUERQUE'S SOURCE WATER

Albuquerque Earned a Source Water Protection Rating of Poor

Albuquerque's groundwater supply, the Santa Fe Group Aquifer, underlies the Middle Rio Grande valley. The aquifer is becoming seriously depleted, and its quality is threatened by septic tanks, abandoned wells, toxic waste spills, and waste disposal sites.[21] In addition, some contaminants increase in concentration as the aquifer is depleted. Also, the city is hoping to use a Rio Grande surface water diversion in the next few years in order to tap its San Juan/Chama river entitlement delivered over the Continental Divide. The Upper San Juan system is seriously threatened with pollution.[22]

Albuquerque has three hazardous waste sites on the Superfund National Priority List (NPL) for cleanup, due at least in part to groundwater contamination

threats. Two Superfund sites are in Albuquerque's predominantly Latino community of San Jose—the South Valley site and the Atchison, Topeka & Santa Fe (AT&SF) Railroad site.[23] At the South Valley site, two Albuquerque municipal wells and 20 private wells were closed because of organic solvent contamination in the 1980s.[24] Tests revealed both shallow and deep groundwater contamination, and a Superfund cleanup is ongoing.[25] Nearby is the AT&SF Superfund site, an abandoned wood-preserving facility with serious arsenic, lead, and creosote contamination. There, the uppermost portion of the drinking water source, the Santa Fe aquifer, is contaminated with creosote contaminants.[26] Within four miles of the site are 15 Albuquerque city wells, 3 Kirtland Air Force Base wells, and 148 private wells that collectively serve more than 43,000 people.[27] A citizens' group called the San Jose Community Awareness Council, working with the Southwest Organizing Project, has been fighting for cleanup of the South Valley and AT&SF sites for more than a decade.[28]

Under downtown Albuquerque, the so-called Fruit Avenue Plume Superfund site is a large mass, two-thirds of a mile long and more than 500 feet deep, of trichloroethylene (TCE)–contaminated groundwater, presumed to be the result of a now-closed dry-cleaning operation.[29] Approximately 187,000 people drink water from wells within a four-mile radius of this site.[30] Two hospital wells were seriously contaminated with TCE, and two city of Albuquerque wells are one to one and three quarter miles from the plume; one of those wells (Yale 1) recently showed trace TCE contamination.[31]

In addition, a number of other waste and underground tank contamination sites are in the city. The State of New Mexico has sued Sandia Labs and General Electric over potential toxic contaminant threats to the groundwater.

PROTECTING ALBUQUERQUE'S DRINKING WATER

Following are approaches to treating Albuquerque's drinking water and information on how residents can help protect their local water.

Treatment Options Available for Contaminants of Greatest Concern

Arsenic. A number of treatment techniques are available to the city to reduce arsenic levels substantially and at a reasonable cost. The EPA estimates that a city the size of Albuquerque can treat its arsenic for less than $2 per household per month.[32] The EPA's arsenic cost estimates were found "credible" in August 2001 by an industry-dominated advisory committee created by the Bush administration, which included one of Albuquerque's key water consultants.[33] Among available treatment options are activated alumina and ion exchange with brine recycle; indeed, ion exchange has already been tested by Albuquerque. Another technology that has already been pilot-tested in Albuquerque and that could lower costs is microfiltration membranes used following chemical treatment/coagulation with ferric chloride.[34] The latter technique reduced Albuquerque's arsenic level to fewer than 2 ppb.[35] Other newer, lower-cost technologies are also becoming available, potentially including "specific anion nano-engineered sorbents," or SANS, a technology developed by Sandia Labs in Albuquerque that is slated for testing in Albuquerque.[36]

Albuquerque has been at the forefront of the fight against the national arsenic standard, arguing at various times that a new EPA standard will cost the city "$190 million to $380 million" (July 2000), or "$250 million" (April 2001), and more recently "as much as $150 million" (November 2001).[37, 38, 39] The city's most recent right-to-know report admits that the arsenic treatment cost will be $30 to $40 million if Albuquerque is allowed to access and blend Rio Grande river water with groundwater.[40] Even without resorting to Rio Grande water, according to one of Albuquerque's water consultants, CH2M Hill, the city's treatment cost will be just $40 to $60 million if the city is able to use microfiltration with ferric chloride treatment.[41] Moreover, the SANS technology, if effective, could drop the cost even further.

Radon. The EPA has found that radon levels in tap water are very inexpensive to reduce using "aeration," a technology that essentially bubbles air through the water. The cost per household is less than $0.80 per

ALBUQUERQUE

City of Albuquerque Public Works Department
Water Utility Division
P.O. Box 1293
Albuquerque, NM 87103
505-857-8260
www.cabq.gov/waterquality/index.html

WATER UTILITY INFORMATION

month for families served by a utility the size of Albuquerque's, according to the EPA.[42]

How Individuals Can Protect Source Water

Citizens can help protect the city's drinking water by working to protect its sources—both by conserving water in their daily lives and by getting involved in community decision making about water resources.

▶ **Attend meetings of the local water supplier,** the Albuquerque Public Works Department's Water Utility Division. Check the right-to-know report or call and ask for dates, times, and locations.

▶ **Get involved in source water assessment and protection efforts** by contacting the utility or find a state government contact by calling the Safe Drinking Water Hotline at 800-426-4791.

Peer reviewers for the Albuquerque report included Dr. Linda Greer, NRDC, and Andrew Kelton, Amigos Bravos (Taos, New Mexico).

NOTES

1 Environmental Protection Agency, Safe Drinking Water Information Database.

2 "Albuquerque 2000 Water Quality Report," p. 8; see also note 5.

3 Note that the contaminant levels are presented as a percentage. Total coliform is regulated as a percentage of positive samples that are present in water. The national health standard of 5 percent means that if more than 5 percent of the utility's total coliform samples test positive, then the national health standard has been violated. To say that a sample tests positive is to say that there are total coliform bacteria present in the sample. Therefore, for compliance purposes, the utilities provide the percentage of total coliform samples that tested positive.

4 Pp. 6–7 (compliance samples taken directly from wells). In certain cases, treatment may slightly reduce these levels. Albuquerque reports averages of 2 ppb to 29 ppb in the distribution system after treatment, depending upon the location, but says these were not formal EPA-required compliance samples, so we do not rely upon them. Ibid., p. 11.

5 See note 2, "Albuquerque 2001 Water Quality Report," page 2.

6 National Academy of Sciences, National Research Council, *Arsenic in Drinking Water: 2001 Update* (National Academy Press, 2001, available online at www.nap.edu/catalog/10194.html The accompanying press release, also available on the website, simply explains the NAS risk calculations. In providing Albuquerque's cancer risk estimate, NRDC has simply interpolated between the NAS's 10 and 20 ppb risk estimates.

7 Some of the haloacetic acids have national health goals of 0 and others have nonzero goals. For the sake of simplicity and understandability, since there is a single haloacettic acid standard, and because it is essentially chemically impossible under normal conditions in tap water to create one regulated haloacetic acid without creating the others at some level, we have listed the national health goal as 0.

8 "Albuquerque 2001 Water Quality Report," April 2002, p. 3; date of detection not reported, but presumed to be 2000 (EPA rules generally require reporting of previous calendar year's testing data unless otherwise indicated).

9 Health effects information on disinfection by-products is summarized from NRDC, *Trouble on Tap* (1995); NRDC, *Bottled Water: Pure Drink or Pure Hype?* (1999), available online at www.nrdc.org/water/drinking/bw/bwinx.asp, and EPA, draft Preamble for Stage 2 Disinfection By-products Regulation, available online at www.epa.gov/safewater/mdbp/st2dis-preamble.pdf.

10 Total trihalomethanes (TTHMs) consist of a sum of the levels of four closely related chemicals—chloroform, dibromochloromethane, bromoform, and bromodichloromethane—which occur together at varying ratios when water is chlorinated. The latter two TTHMs have health goals of 0. The EPA promulgated and then withdrew (after a court decision) a 0 health goal for chloroform and has not yet issued a new goal for chloroform. Dibromochloromethane has a health goal of 60 ppb. Since water systems generally report only the combined TTHM level, and since it is essentially chemically impossible to create one trihalomethane in tap water without some level of the others, we list the health goal for TTHMs as 0.

11 "Albuquerque 2000 Water Quality Report," April 2001.

12 A maximum level of trihalomethanes of 5.2 ppb was reported in Albuquerque's 2001 right-to-know report. Based upon the previous year's data, it appears that this was the highest quarterly average for 2001, not the actual maximum level recorded; EPA's rules have been interpreted by many water systems to authorize reporting the highest quarterly average trihalomethane level as the maximum.

13 See note 8.

14 "Albuquerque 2001 Water Quality Report," April 2002, p. 3.

15 National Academy of Sciences cancer risk estimates, cited in EPA, Proposed Radon in Drinking Water Rule, 64 Fed. Reg. 59246, 59270 (Table VII.1) (November 2, 1999).

16 "Albuquerque 2000 Water Quality Report," April 2001, p. 11.

17 "Albuquerque 2000 Water Quality Report," April 2001, p. 11.

18 "Albuquerque 2001 Water Quality Report," April 2002.

19 "Albuquerque 2000 Water Quality Report," April 2001, p. 1.

20 "Albuquerque 2001 Water Quality Report," April 2002.

21 Doug Earp, Jeanne Pestlethwait, and Jean Witherspoon, "Albuquerque's Environmental Story: Environment Topic: Water," available online at www.ci.albuquerque.nm.us/aes/s5water.html; Albuquerque Water Quality Report, April 2001, pp. 2–3.

22 EPA, Index of Watershed Indicators, Upper San Juan River, available online at www.epa.gov/iwi/hucs/14080101/score.html#.

23 EPA Region 6, National Priority List Fact Sheet, AT&SF Railroad (Albuquerque) Site (November 2001); EPA Region 6, National Priority List Fact Sheet: South Valley Site (November 2001); Delores Herrera, "Albuquerque's Environmental Story: Environment Topic: Environmental Justice," available online at www.ci.albuquerque.nm.us/aes/s5enjus.html, (1996).

24 EPA Region 6, National Priority List Fact Sheet: South Valley Site (November 2001).

25 Ibid.

26 EPA Region 6, National Priority List Fact Sheet, AT&SF Railroad (Albuquerque) Site (11/01).

27 Ibid.

28 Delores Herrera, "Albuquerque's Environmental Story: Environment Topic: Environmental Justice," available online at www.ci.albuquerque.nm.us/aes/s5enjus.html (1996).

29 EPA Region 6, National Priority List Fact Sheet, Fruit Avenue Plume Superfund Site (November 30, 2001).

30 Ibid.

31 Ibid.

32 EPA, Final Arsenic National Primary Drinking Water Regulation, 66 Fed. Reg. 6976, 7011 (Table III.E.2) (January 22, 2001).

33 National Drinking Water Advisory Council, "Arsenic Costs Work Group, Report of the Arsenic Cost Working Group to the National Drinking Water Advisory Council," p. 2 (August 14, 2001).

34 City of Albuquerque, "Arsenic Removal," available online at cabq.gov/waterresources/arsenicremoval.html; EPA, "Arsenic in Drinking Water Treatment Technologies: Removal" (available online at epa.gov/safewater/ars/treat.html).

35 EPA, ibid, at 3.

36 S.J. Ludescher, "Sandia Process Traps Arsenic Cheaply," *Albuquerque Tribune*, p. A1 (May 29, 2001); Sandia National Laboratories, "Sandia Arsenic Catchers Could Help Communities Supply Safer Drinking Water Affordably," News Release, May 24, 2001 (available online at www.sandia.gov/media/NewsRel/NR2001/sanssorb.htm).

37 "Albuquerque 1999 Water Quality Report," July 2000.

38 S.J. Ludescher, "Sandia Process Traps Arsenic Cheaply," *Albuquerque Tribune*, p. A1 (May 29, 2001) (citing estimate from "city officials").

39 Ollie Reed, "Arsenic Ruling May Cost City Millions," *Albuquerque Tribune*, p. A1 (November 1, 2001) (quoting Water Resources Manager John Stomp).

40 "Albuquerque Water Quality Report," April 2001, p. 11; Stomp confirmed this $30 to 40 million figure in November 2001. Ollie Reed, "Arsenic Ruling May Cost City Millions," *Albuquerque Tribune*, p. A1 (November 1, 2001).

41 Steve Shoup, "City to Test Reducing Arsenic in Water," *Albuquerque Journal*, p. A1 (November 10, 2000).

42 EPA, Proposed Radon in Drinking Water Rule, 64 Fed. Reg. 59246, 59328 (Table XIII.11) (November 2, 1999).