

Health Consultation

Total and Hexavalent Chromium, Lead, Mercury, Nitrate, and Thallium
Levels in Water from Private Domestic Wells Near the Pacific Gas and Electric
Facility in Hinkley, California

PACIFIC GAS AND ELECTRIC FACILITY

HINKLEY, SAN BERNARDINO COUNTY, CALIFORNIA

EPA FACILITY ID: CA0000206656

APRIL 22, 2003

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

You May Contact ATSDR TOLL FREE at
1-888-42ATSDR

or

Visit our Home Page at: <http://www.atsdr.cdc.gov>

HEALTH CONSULTATION

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in Hinkley, California

PACIFIC GAS AND ELECTRIC FACILITY
HINKLEY, SAN BERNARDINO COUNTY, CALIFORNIA

EPA FACILITY ID: CA0000206656

Prepared by:

California Department of Health Services
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

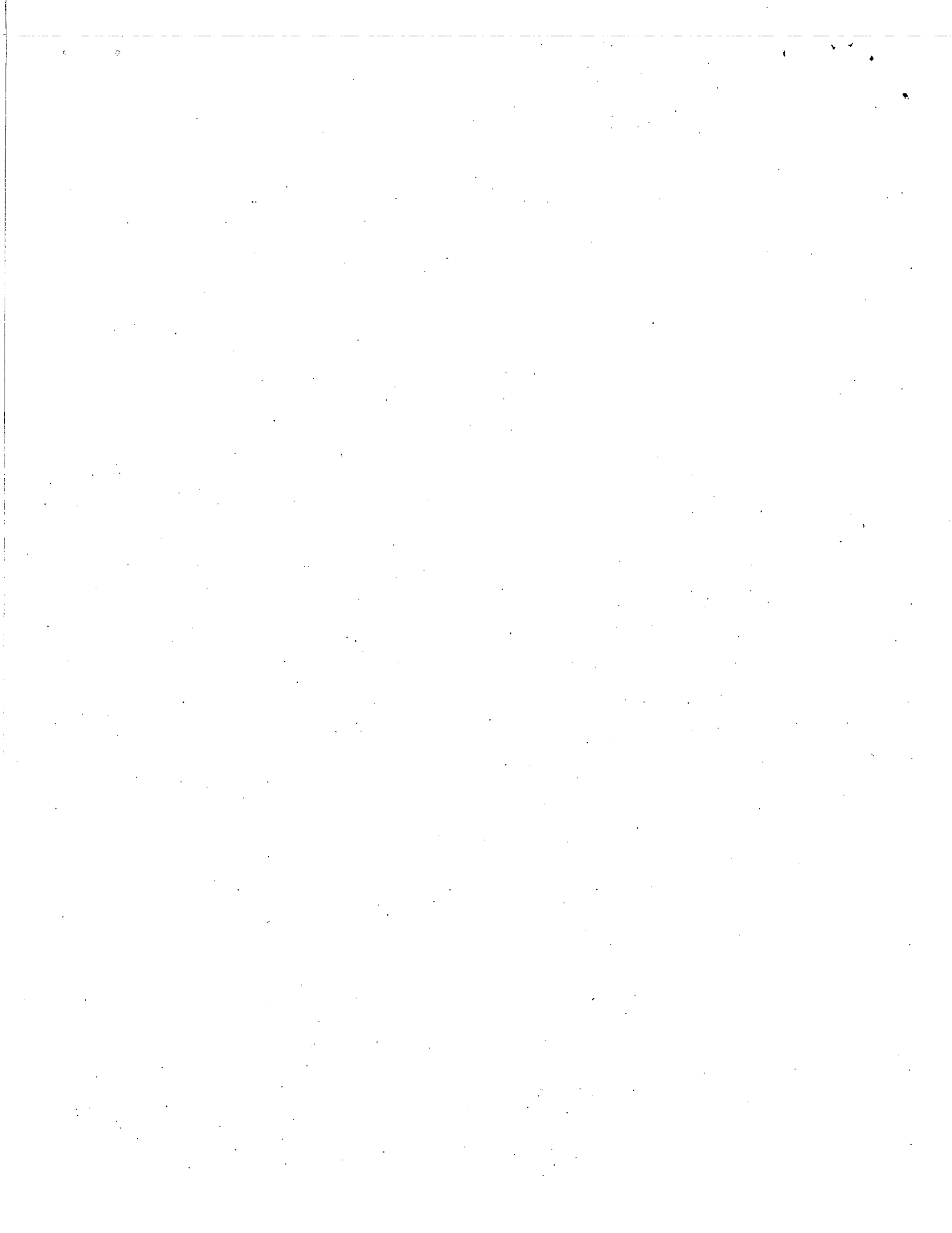
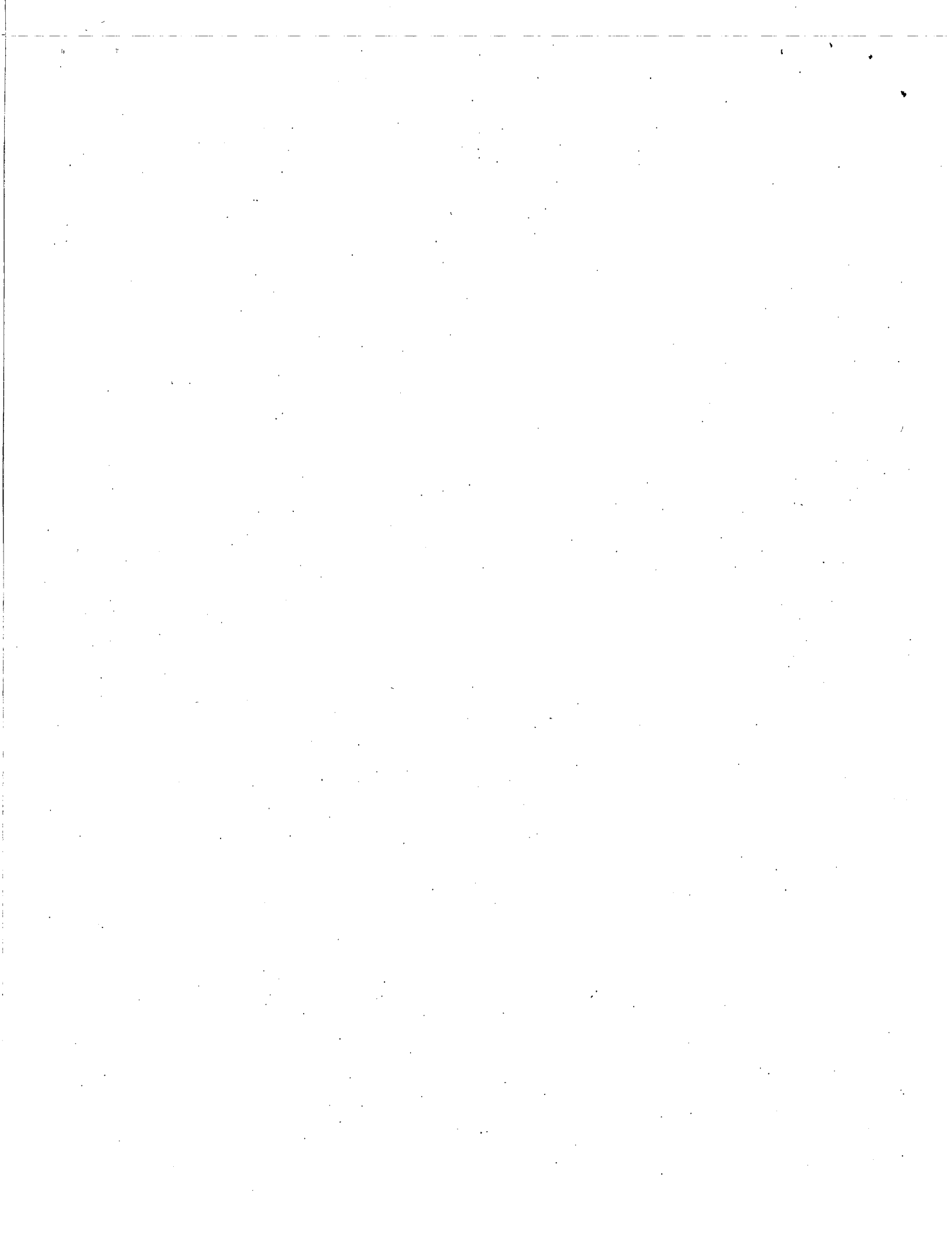


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Summary

In August 2001, the Environmental Health Investigations Branch (EHIB) of the California Department of Health Services (CDHS) was asked by the Lahontan Regional Water Quality Control Board (Lahontan RWQCB) to review and provide a public health interpretation of sampling results for 25 private domestic wells in Hinkley, California. These wells are located around the area of groundwater that has been contaminated with chromium by the Pacific Gas & Electric (PG&E) gas compressor station. The content of the letters that EHIB sent to the residences and property owners is the basis of this health consultation (see Appendices A-D). EHIB has a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR) and this health consultation is being forwarded to ATSDR for their concurrence.

Background and Statement of Issues

In December 2000, EHIB completed a public health assessment of exposures from the PG&E gas compressor station, in which EHIB recommended that the Lahontan RWQCB sample private domestic wells located around the chromium-contaminated groundwater for total chromium and hexavalent chromium. In August 2001, the Lahontan RWQCB sampled 25 private domestic wells and had the water analyzed for total and hexavalent chromium. In order to improve their understanding of the quality of the groundwater, the Lahontan RWQCB also had the water analyzed for other metals and minerals that are regulated in public drinking water systems. The private wells were not tested for coliform. EHIB reviewed the results of these tests and compared the levels of contaminants to drinking water standards. The levels of total and hexavalent chromium did not exceed the drinking water standard for total chromium in any of the 25 wells. The levels of lead, nitrate, mercury, and thallium were higher than the primary Maximum Contaminant Level (MCL, or drinking water standard) in ten residential wells (see Appendices A-D).

Discussion

The following is a summary of the total and hexavalent chromium, lead, nitrate, mercury and thallium findings, as well as the pertinent information that was included in the letters to the 17 residences and five property owners (for more detail refer to Appendices A-D). Copies of the laboratory reports for the chromium, other metals and minerals tests were included with each letter.

Total and Hexavalent Chromium

None of the private domestic wells sampled by Lahontan RWQCB had levels of total chromium above California's drinking water standard (50 micrograms per liter ($\mu\text{g/L}$); US Environmental Protection Agency's MCL is 100 $\mu\text{g/L}$). There is no drinking water standard for hexavalent chromium. The letters provided the results of the total and hexavalent chromium analyses and explained that no health effects were expected to result from the levels measured in their water. EHIB included a copy of the laboratory results for the chromium tests as well as a fact sheet on

“Chromium in Drinking Water” that was developed jointly by the CDHS Division of Drinking Water and Environmental Management and the California Environmental Protection Agency Office of Environmental Health Hazard Assessment (see Appendix E).

Lead

Seven wells had lead levels above the drinking water standard (0.015 milligrams per liter (mg/L)). The levels of lead in these wells ranged from 0.05 mg/L to 0.10 mg/L. In the letters to the nine residences served by these wells, EHIB described the susceptibility of children to lead poisoning, provided contact information for childhood blood lead tests, and included two information brochures on childhood lead poisoning (see Appendices F and G). Though the source of the lead contamination is currently unknown, community members were informed of possible sources of lead contamination.

Mercury

The level of mercury in one well was 0.0029 milligrams per liter (mg/L), which is higher than the drinking water standard (0.002 mg/L). In the letter to the property owner, EHIB described the health effects of mercury as well as possible sources of mercury contamination. A definite source of the mercury contamination is currently unknown.

Nitrate

Eight wells had nitrate levels above the drinking water standard (10 milligrams mg/L). The levels of nitrate in these wells ranged from 12 mg/L to 62 mg/L. In the letters to the residences, EHIB described the susceptibility of pregnant women and formula-fed infants to nitrate, and provided an EHIB fact sheet on “Health Concerns Related to Nitrate and Nitrite in Private Well Water” (see Appendix H). Though the source of the nitrate contamination is currently unknown, community members were informed of typical sources of nitrate contamination, namely agricultural and dairy farms.

Thallium

Two wells had thallium levels above the drinking water standard (0.002mg/L). The levels of thallium in these wells were 0.11 mg/L and 0.19 mg/L. In the letters to the two residences, EHIB described the health effects of thallium, and discussed possible sources of thallium contamination. A definite source of the thallium contamination is currently unknown.

Follow-Up Testing

During the week of September 24, 2001, the Lahontan RWQCB sampled the wells with elevated levels of lead, nitrate, mercury, and thallium for confirmation testing. The Lahontan RWQCB provided the residents and property owners with the results of these tests.

Conclusions

The levels of total chromium measured in the 25 private domestic wells are below the drinking water standard for total chromium and do not pose a health risk. The levels of lead, mercury, nitrate, and thallium were above the drinking water standards and, therefore, may pose a health hazard.

Public Health Action Plan

The Public Health Action Plan (PHAP) for this site contains a description of actions taken, to be taken, or under consideration by ATSDR and EHIB at and near the site. The purpose of the PHAP is to ensure that this health consultation not only identifies public health hazards, but also provides a plan of action designed to mitigate and prevent adverse human health effects resulting from exposure to hazardous substances in the environment. EHIB and ATSDR will follow-up on this plan to ensure that actions are carried out.

Actions Completed:

1. EHIB informed Hinkley residents of the results and health implications of the private domestic well testing performed by Lahontan RWQCB.
2. EHIB informed the residents and property owners that their water was not tested for coliform, one of the more common water contaminants.
3. EHIB recommended that the residences with elevated levels of lead in their well water use a different water supply (bottled or municipal) for drinking and cooking.
4. EHIB recommended that children who had consumed water from the lead contaminated wells get a blood lead test.
5. EHIB recommended that pregnant women and formula-fed infants who consume water from the wells with elevated levels of nitrate use a different water supply (bottled or municipal) for drinking, cooking, and making infant formula.
6. EHIB recommended that the residents served by the well with elevated mercury use a different water supply (bottled or municipal) for drinking and cooking.
7. EHIB recommended that the residents and property owner of the well with elevated mercury continue to test their well for mercury and try to identify the source of the contamination.
8. EHIB informed the residents and property owners that store-bought water filters are not certified to meet drinking water standards.

9. EHIB informed the residents and property owners that private wells are not regulated or tested by the state and that the owners of private wells are responsible for making sure that the water is safe to consume.

Recommendation:

1. EHIB recommends that private well owners test their wells on a regular basis for chemicals, metals, minerals and bacteria that may be present in underground water at levels injurious to health.

Preparers of Report

Environmental and Health Effects Assessors

Jackie Schwartz, MPH
Environmental Health Scientist
Environmental Health Investigations Branch
California Department of Health Services

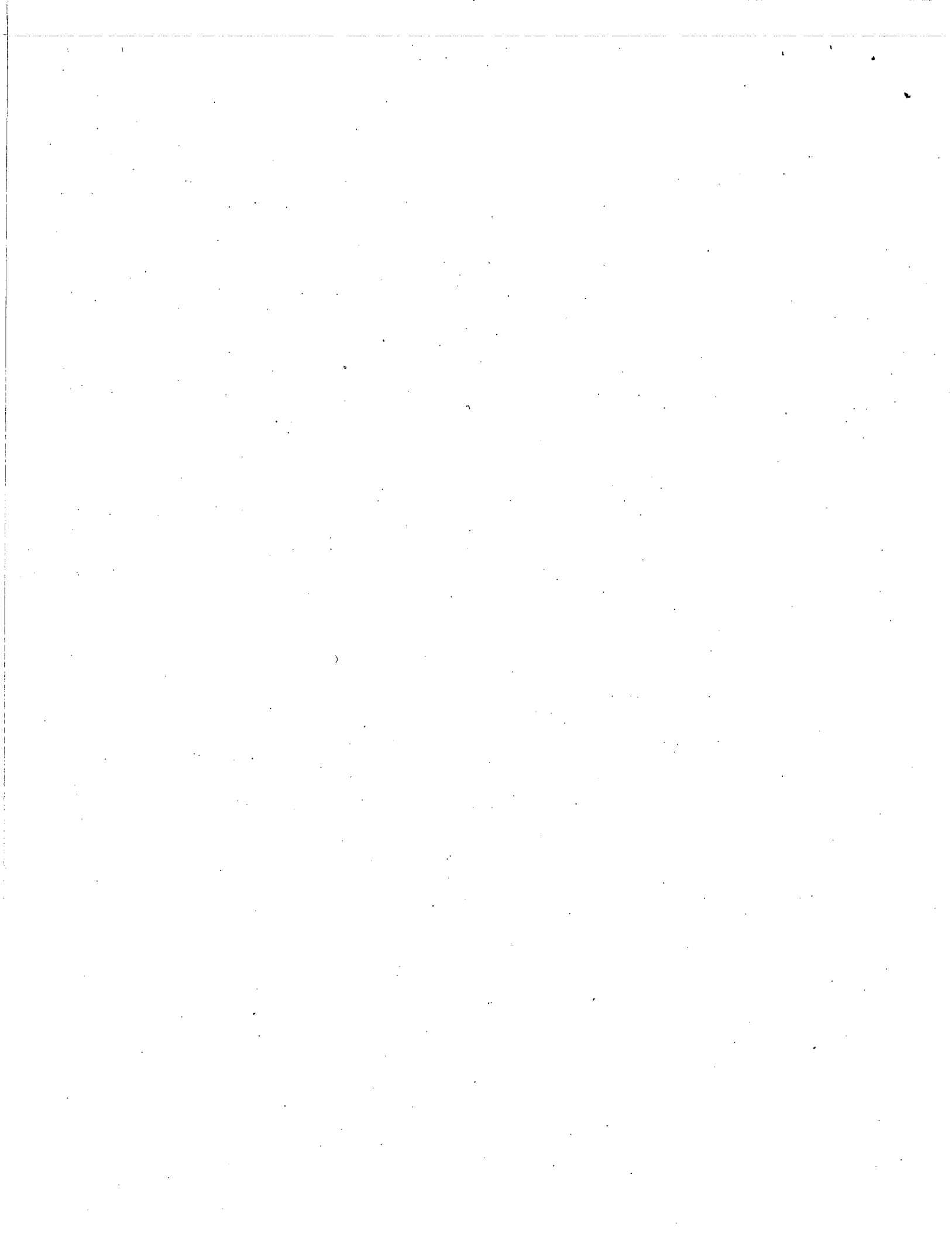
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Environmental Health Scientist
Environmental Health Investigations Branch
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ATSDR Regional Representatives

William Nelson
Gwendolyn Eng
Libby Levy
Regional Representatives, Region IX
Agency for Toxic Substances and Disease Registry

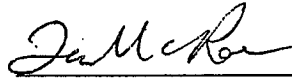
ATSDR Technical Project Officer

Tammie McRae, M.S.
Environmental Health Scientist
Division of Health Assessment and Consultation
Superfund Site Assessment Branch, State Programs Section



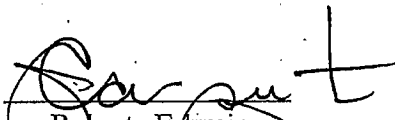
Certification

This Total and Hexavalent Chromium, Lead, Mercury, Nitrate, and Thallium Levels in water from Private Domestic Wells Near the Pacific Gas & Electric Facility in Hinkley, California, Health Consultation was prepared by the California Department of Health Services under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with the approved methodology and procedures existing at the time the health consultation was begun.

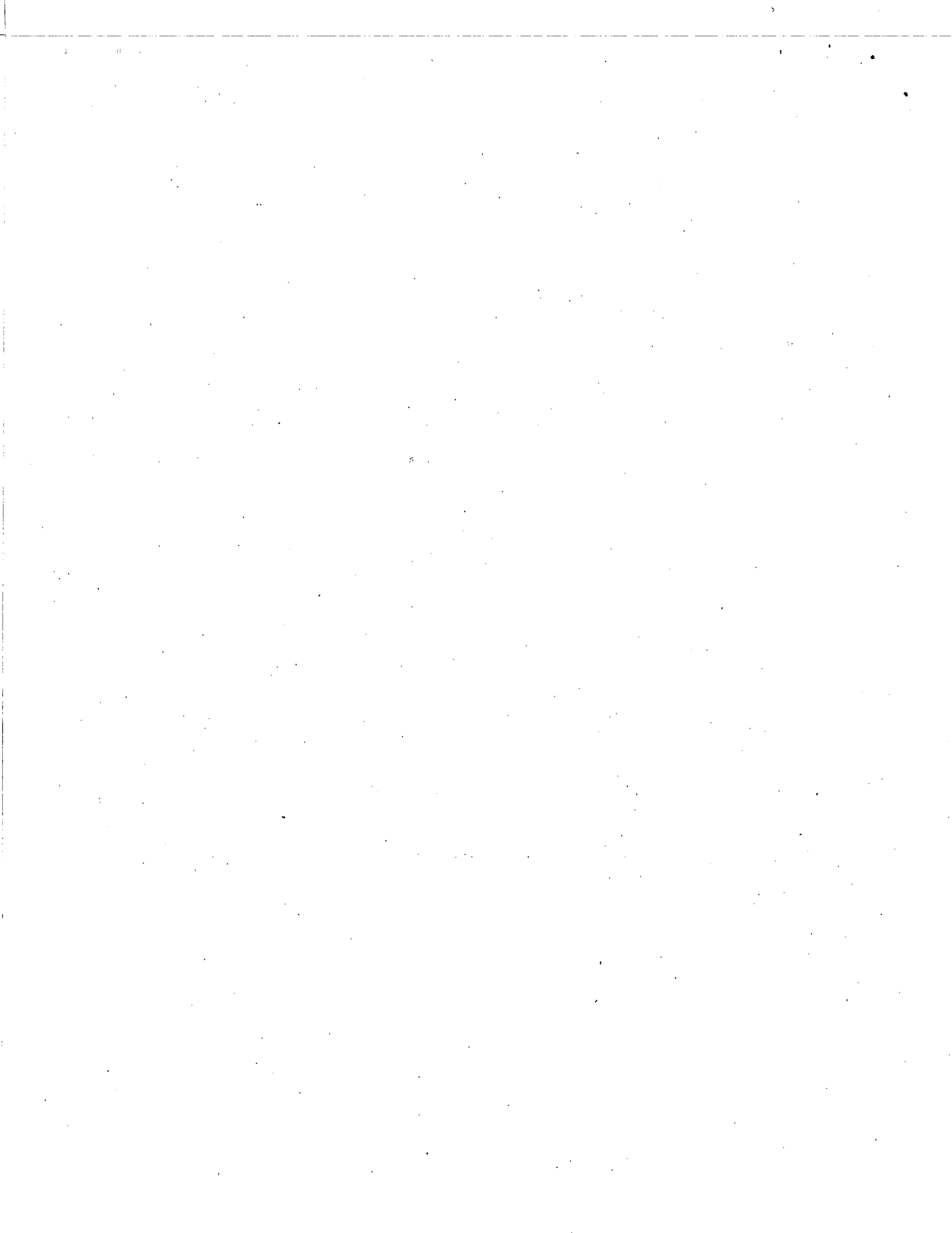


Tammie McRae, M.S.
Technical Project Officer
Superfund Site Assessment Branch (SSAB)
Division of Health Assessment and Consultation (DHAC)
ATSDR

The Division of Health Assessment and Consultation, ATSDR, has reviewed this health consultation, and concurs with its findings.



Roberta Erlwein.
Chief, SPS, SSAB, DHAC, ATSDR



Appendix A-D

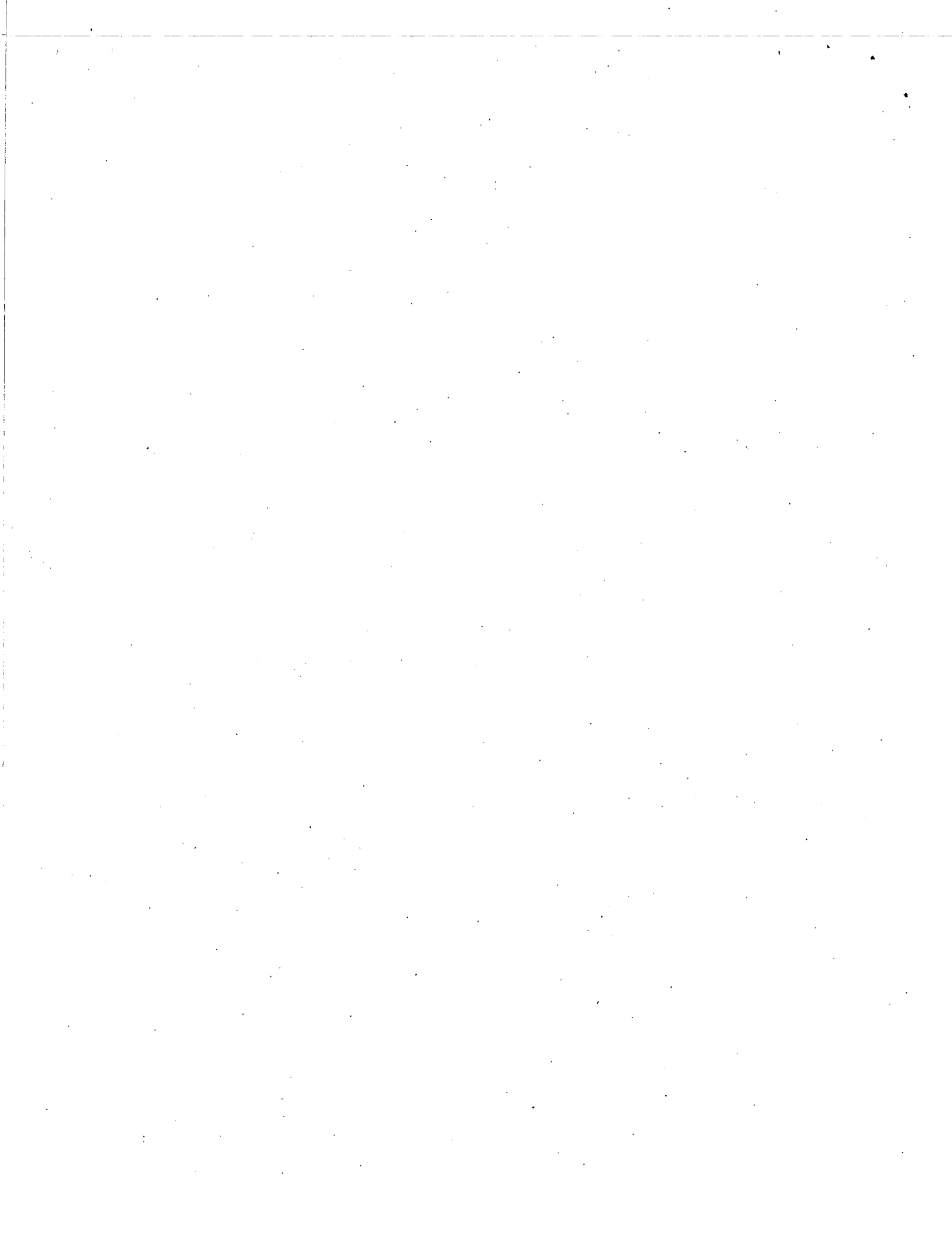
Letters

To: Hinkley Residents and Property Owner

Re: Results of Private Well Testing

From: The California Department of Health Services

Date: September 14, 2001



DEPARTMENT OF HEALTH SERVICES

1515 CLAY STREET, SUITE 1700
OAKLAND, CA 94612
(510) 622-4500



September 14, 2001

Resident/Property Owner
Hinkley, CA

Dear Resident/Property Owner:

We are writing to provide you with the results of the tests that the Lahontan Regional Water Quality Control Board recently performed on water from your private well (located at ADDRESS). Your private well water was tested because it is located near the area of the groundwater that has been contaminated with chromium 6 (hexavalent chromium) by the Pacific Gas and Electric Company. We (the California Department of Health Services Environmental Health Investigations Branch) recommended that the Lahontan Regional Water Quality Control Board measure the levels of total chromium and chromium 6 in private wells located near the chromium 6 groundwater contamination.

The Lahontan Regional Water Quality Control Board had E.S. Babcock & Sons laboratory measure the levels of total chromium and chromium 6 in your private drinking well water. In order to learn more about the characteristics and quality of the groundwater, they also had NEL laboratories analyze your water for metals, minerals and other inorganic compounds. At high levels, these compounds can make water either unsafe or unpleasant (bad taste, odor or appearance) to drink. Copies of the laboratory reports are included with this letter.

We reviewed the results of the tests that were performed on water from your private well. We also compared the levels of compounds in your water to the levels that are allowed in public drinking water systems. (The state of California regulates public drinking water systems in order to ensure the safety and the quality of public water supplies.)

As we will explain in more detail in the remainder of this letter, the levels of total chromium and chromium 6 in your drinking water do not pose a risk to your health. However, the levels of lead, chloride, specific conductance, sulfate, and total dissolved solids in your water do exceed public drinking water standards and therefore may affect the safety or the quality (taste, odor, appearance) of your well water.

Results for Total Chromium and Chromium 6

The California drinking water standard for total chromium was created in order to ensure that public water supplies are safe to drink. The drinking water standard for total chromium is 50 micrograms per liter ($\mu\text{g/L}$). There is no specific drinking water standard for chromium 6.

Total chromium is made up of chromium 3 (trivalent chromium) and chromium 6. The Lahontan Regional Water Quality Control Board measured the levels of total chromium and chromium 6 in your water. The test results show that your private well water contains 6 $\mu\text{g/L}$ ppb total chromium and 0.63 $\mu\text{g/L}$ chromium 6.

The amount of total chromium in your private well water is below the drinking water standard for total chromium and therefore does not pose a risk to your health.

We have included a fact sheet that provides more information on chromium in drinking water and on the chromium drinking water standard.

Results for Lead

The California drinking water standard for lead was created to ensure that public water supplies are safe to drink. The drinking water standard for lead is 0.015 milligrams per liter (mg/L).

The test results show that the concentration of lead in your private well water is 0.079 mg/L. This amount is higher than the California drinking water standard of 0.015 mg/L.

Children under six years old are at the highest risk for lead poisoning. Lead poisoning can harm the brain, nerves and kidneys of a young child and make it very hard for a child to learn, pay attention, and behave. Most children with lead poisoning do not look or act sick.

There are many ways that children may be exposed to lead, including air, water, dust, soil and older paints that contain lead. We have included two brochures that provide more information on childhood lead poisoning and the ways that children may be exposed to lead.

A child who drinks water from your well and who is also exposed to lead from other common sources may be exposed to greater amounts of lead than is recommended. **If you have a young child who drinks water from your well, or if you have other sources of lead exposure in your home (for example, paint manufactured before 1978), we recommend that you use different water (municipal or bottled). We also**

Resident/Property Owner
September 14, 2001
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recommend that the child have a blood lead test. The blood lead test is the only way to know if your child has lead poisoning. Your doctor or clinic can give your child a blood lead test. You may also call the San Bernardino County Childhood Lead Poisoning Prevention Program at (909) 387-6305 for further information on lead poisoning and the blood lead test.

The source of the lead contamination is currently unknown. Because water was taken from your well and not from inside your house, we do know that the source of the lead contamination is not your plumbing. The lead in your water could be coming from a material that was used to construct your well or from an outside source that has contaminated the groundwater in your area. We recommend that you ask your well constructor if lead solder was used to construct your well. This information should be recorded in the drill records for your well.

Results for Chloride, Specific Conductance, Sulfate, and Total Dissolved Solids

The drinking water standards for chloride, specific conductance, sulfate, and total dissolved solids were created in order to protect the quality (taste, odor, appearance) of public water supplies. The standard for chloride is 250 mg/L, for specific conductance is 900 micromhos ($\mu\text{S}/\text{cm}$), for sulfate is 250 mg/L and for total dissolved solids is 500 mg/L.

The test results show that your private well water has 660 mg/L chloride, 3600 $\mu\text{S}/\text{cm}$ specific conductance, 580 mg/L sulfate, and 2340 mg/L total dissolved solids. These levels are higher than the California drinking water standards. High levels of chloride, specific conductance, sulfate, and total dissolved solids may affect the taste, odor or appearance of your well water. **These compounds do not put your health at risk.**

Follow-up Testing

One water test does not provide enough information to fully understand the safety and quality of your water. For this reason, the Lahontan Regional Water Quality Control Board would like to take another sample of your well water in the near future. They will retest the water for lead, thallium, chloride, specific conductance, sulfate, and total dissolved solids. Lahontan Regional Water Quality Control Board will provide you with the results of these tests.

Resident/Property Owner
September 14, 2001
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Recommendations for Private Well Owners

Many chemicals, metals, minerals and bacteria may be present in private wells and may threaten the safety and quality of your drinking water. These compounds can come from both natural sources and human activity. Private drinking water wells are not regulated or tested by the state, so people with private wells are responsible for making sure that their own drinking water is safe.

We encourage you to have your well water tested routinely to ensure the safety of your drinking water. Since bacteria are the most common problem in private wells, we would suggest that you have your well tested for coliform on a periodic basis. **The Lahontan Regional Water Quality Control Board did not perform a bacteria test on your well water.**

Lastly, California-certified water filters and treatment systems that you can purchase in stores are not intended to treat water with levels of contaminants that are above the health-based drinking water standard. Therefore, we do not recommend that you rely upon these filters and treatment systems to reduce the levels of nitrate, lead, and mercury measured in your well water.

If you have any questions about the information we have provided, please do not hesitate to call Tracy Barreau at (510) 622-4489 or Jackie Schwartz at (510) 622-4487.

Sincerely,

Jackie Schwartz, MPH
Environmental Health Scientist
Environmental Health Investigations Branch

Marilyn Underwood, Ph.D.
Staff Toxicologist
Environmental Health Investigations Branch

Enclosures

cc: Harold Singer, Executive Officer
Lahontan Regional Water Quality Control Board
2501 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150

Resident/Property Owner
September 14, 2001
Page 5 of 5

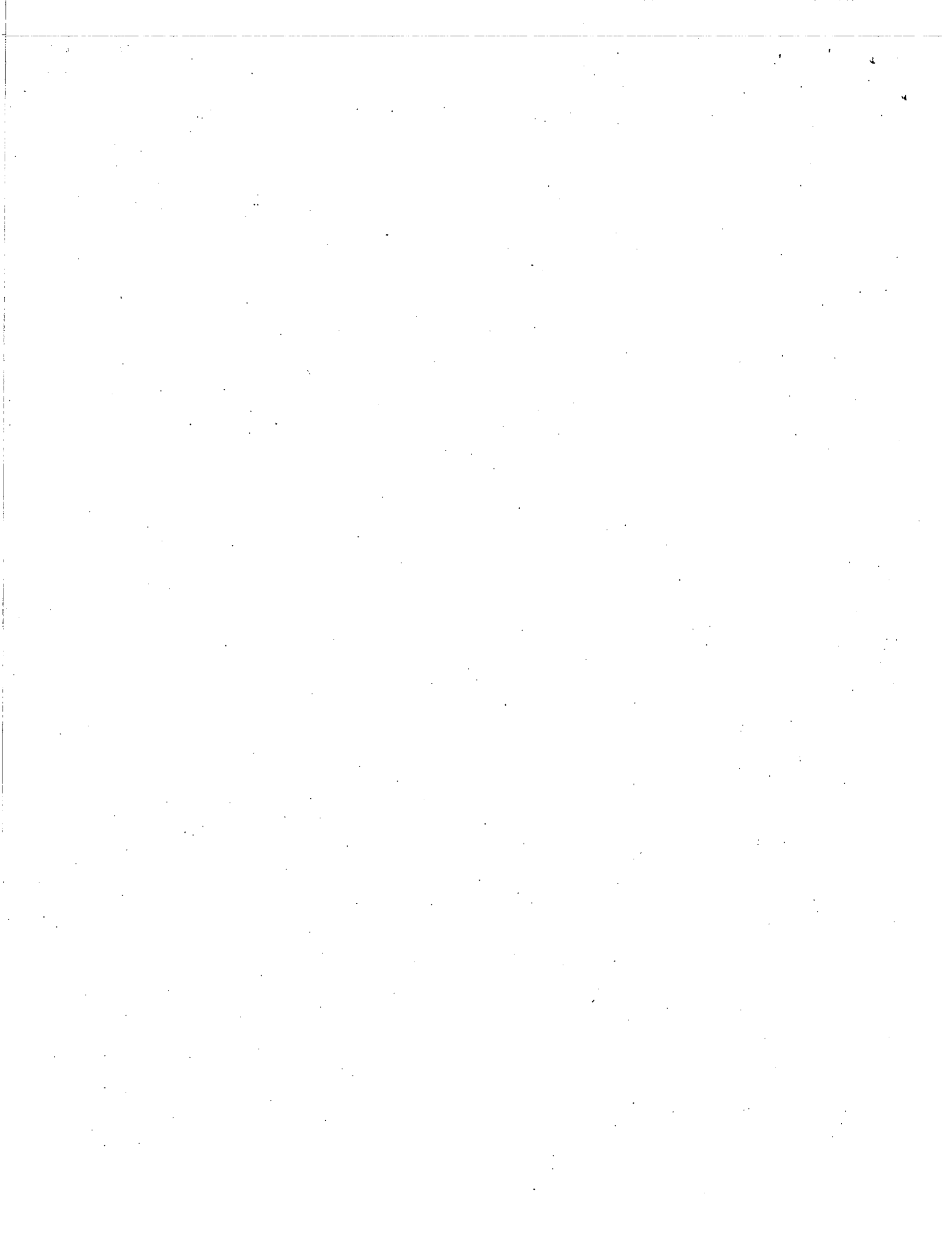
Mike Plaziak, Acting Mojave Unit Chief
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William Vance, Assistant Secretary of Air and Water Programs
California Environmental Protection Agency
1001 "I" Street, 25th Floor
Sacramento, CA 95814

Lynn Baker, Staff Air Pollution Specialist
California Air Resources Board
1001 "I" Street, 6th Floor
Sacramento, CA 95814

Property Owner



DEPARTMENT OF HEALTH SERVICES

1515 CLAY STREET, SUITE 1700
OAKLAND, CA 94612
(510) 622-4500



September 13, 2001

Resident/Property Owner
Hinkley, CA

Dear Resident/Property Owner:

We are writing to provide you with the results of the tests that the Lahontan Regional Water Quality Control Board recently performed on water from your private well (located at **ADDRESS**). Your private well water was tested because it is located near the area of the groundwater that has been contaminated with chromium 6 (hexavalent chromium) by the Pacific Gas and Electric Company. We (the California Department of Health Services Environmental Health Investigations Branch) recommended that the Lahontan Regional Water Quality Control Board measure the levels of total chromium and chromium 6 in private wells located near the chromium 6 groundwater contamination.

The Lahontan Regional Water Quality Control Board had E.S. Babcock & Sons laboratory measure the levels of total chromium and chromium 6 in your private drinking well water. In order to learn more about the characteristics and quality of the groundwater, they also had NEL laboratories analyze your water for metals, minerals and other inorganic compounds. At high levels, these compounds can make water either unsafe or unpleasant (bad taste, odor or appearance) to drink. Copies of the laboratory reports are included with this letter.

We reviewed the results of the tests that were performed on water from your private well. We also compared the levels of compounds in your water to the levels that are allowed in public drinking water systems. (The state of California regulates public drinking water systems in order to ensure the safety and the quality of public water supplies.)

As we will explain in more detail in the remainder of this letter, the levels of total chromium and chromium 6 in your drinking water do not pose a risk to your health. However, the levels of nitrate, thallium, specific conductance, sulfate, and total dissolved solids in your water do exceed public drinking water standards and therefore may affect the safety or the quality (taste, odor, appearance) of your well water.

Results for Total Chromium and Chromium 6

The California drinking water standard for total chromium was created in order to ensure that public water supplies are safe to drink. The drinking water standard for total chromium is 50 micrograms per liter ($\mu\text{g/L}$). There is no specific drinking water standard for chromium 6.

Total chromium is made up of chromium 3 (trivalent chromium) and chromium 6. The Lahontan Regional Water Quality Control Board measured the levels of total chromium and chromium 6 in your water. The test results show that your private well water contains 24 $\mu\text{g/L}$ ppb total chromium and 24 $\mu\text{g/L}$ chromium 6.

The amount of total chromium in your private well water is below the drinking water standard for total chromium and therefore does not pose a risk to your health.

We have included a fact sheet that provides more information on chromium in drinking water and on the chromium drinking water standard.

Results for Nitrate

The California drinking water standard for nitrate was created to ensure that public water supplies are safe to drink. The drinking water standard for nitrate is 10 milligrams per liter as nitrogen (mg/L-N).

The test results show that the concentration of nitrate in your private well water is 20 mg/L-N. This level is greater than the California drinking water standard of 10 mg/L-N. The source of the nitrate contamination of your well water is unknown; however, nitrate is commonly found in water supplies, especially in agricultural areas.

Pregnant women and young infants who drink water contaminated with high levels of nitrate are the most at risk of developing serious health problems. However, these health problems will stop once you are no longer exposed to nitrate. **If you are pregnant or have a young infant (under six months old), we recommend that you use different water (for example, municipal or bottled water) for drinking, cooking, and making infant formula.**

We have included a brochure that provides more information on nitrate. The brochure is titled "Health Concerns Related to Nitrate and Nitrite in Private Well Water."

Results for Thallium

The California drinking water standard for thallium was created to ensure that public water supplies are safe to drink. The drinking water standard for thallium is 0.002 milligrams per liter (mg/L).

The test results show that the amount of thallium in your private well water is 0.11 mg/L. This level is greater than the California drinking water standard of 0.002 mg/L. The source of the thallium contamination in your well water is currently unknown. Thallium is a metal that is found in natural deposits in soil and rock. Leaching from ore processing operations is the major source of thallium contamination in water.

People who consume high amounts of thallium for a short period of time can experience problems with their digestion and nervous system. Exposure to high levels of thallium over a lifetime can cause hair loss, changes in blood chemistry, or damage to the liver, kidney, and digestive tract.

Because the level of thallium in your well water is above the drinking water standard, we recommend that you use water from a different source (bottled or municipal) for drinking, cooking, and watering your vegetable, fruit garden. It may also be advisable to not give your well water to your animals. We also recommend that you test your well water for thallium again in order to confirm and better understand the amount of thallium in your water.

Results for Specific Conductance, Sulfate, and Total Dissolved Solids

The drinking water standards for specific conductance, sulfate, and total dissolved solids were created in order to protect the quality (taste, odor, appearance) of public water supplies. The standard for specific conductance is 900 micromhos ($\mu\text{S}/\text{cm}$), for sulfate is 250 mg/L and for total dissolved solids is 500 mg/L.

The test results show that your private well water has 1680 $\mu\text{S}/\text{cm}$ specific conductance, 280 mg/L sulfate, and 1050 mg/L total dissolved solids. These levels are higher than the California drinking water standards. High levels of specific conductance, sulfate, and total dissolved solids may affect the taste, odor or appearance of your well water. **However, these compounds do not put your health at risk.**

Follow-up Testing

One water test does not provide enough information to fully understand the safety and quality of your water. For this reason, the Lahontan Regional Water Quality Control Board would like to take another sample of your well water in the near future. They will

Resident/Property Owner
September 13, 2001
Page 4 of 5

retest the water for nitrate, thallium, specific conductance, sulfate, and total dissolved solids. Lahontan Regional Water Quality Control Board will provide you with the results of these tests.

Recommendations for Private Well Owners

Many chemicals, metals, minerals and bacteria may be present in private wells and may threaten the safety and quality of your drinking water. These compounds can come from both natural sources and human activity. Private drinking water wells are not regulated or tested by the state, so people with private wells are responsible for making sure that their own drinking water is safe.

We have recommended that you do not use your well water for drinking and cooking. **Should you switch to a different or a new well, we encourage you to routinely test that well to ensure the safety of your drinking water.** Since bacteria are the most common problem in private wells, we would suggest that you also have the water tested for coliform.

Lastly, California-certified water filters and treatment systems that you can purchase in stores are not intended to treat water with levels of contaminants that are above the health-based drinking water standard. Therefore, we do not recommend that you rely upon these filters and treatment systems to reduce the levels of nitrate, lead, and mercury measured in your well water.

If you have any questions about the information we have provided, please do not hesitate to call Tracy Barreau at (510) 622-4489 or Jackie Schwartz at (510) 622-4487.

Sincerely,

Jackie Schwartz, MPH
Environmental Health Scientist
Environmental Health Investigations Branch

Marilyn Underwood, Ph.D.
Staff Toxicologist
Environmental Health Investigations Branch

Enclosures

Resident/Property Owner
September 13, 2001
Page 5 of 5

cc: Harold Singer, Executive Officer
Lahontan Regional Water Quality Control Board
2501 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150

Mike Plaziak, Acting Mojave Unit Chief
Lahontan Regional Water Quality Control Board
15428 Civic Drive, Suite 100
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DEPARTMENT OF HEALTH SERVICES

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September 14, 2001

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Results for Total Chromium and Chromium 6

The California drinking water standard for total chromium was created in order to ensure that public water supplies are safe to drink. The drinking water standard for total chromium is 50 micrograms per liter ($\mu\text{g/L}$). There is no specific drinking water standard for chromium 6.

Total chromium is made up of chromium 3 (trivalent chromium) and chromium 6. The Lahontan Regional Water Quality Control Board measured the levels of total chromium and chromium 6 in your water. The test results show that your private well water contains 13 $\mu\text{g/L}$ ppb total chromium and 1.5 $\mu\text{g/L}$ chromium 6.

The amount of total chromium in your private well water is below the drinking water standard for total chromium and therefore does not pose a risk to your health.

We have included a fact sheet that provides more information on chromium in drinking water and on the chromium drinking water standard.

Results for Nitrate

The California drinking water standard for nitrate was created to ensure that public water supplies are safe to drink. The drinking water standard for nitrate is 10 milligrams per liter as nitrogen (mg/L-N).

The test results show that the concentration of nitrate in your private well water is 12 mg/L-N. This level is greater than the California drinking water standard of 10 mg/L-N. The source of the nitrate contamination of your well water is unknown; however, nitrate is commonly found in water supplies, especially in agricultural areas.

Pregnant women and young infants who drink water contaminated with high levels of nitrate are the most at risk of developing serious health problems. However, these health problems will stop once you are no longer exposed to nitrate. **If you are pregnant or have a young infant (under six months old), we recommend that you use different water (for example, municipal or bottled water) for drinking, cooking, and making infant formula.**

We have included a brochure that provides more information on nitrate. The brochure is titled "Health Concerns Related to Nitrate and Nitrite in Private Well Water."

Results for Specific Conductance and Total Dissolved Solids

The drinking water standards for specific conductance and total dissolved solids were created in order to protect the quality (taste, odor, appearance) of public water supplies. The standard for specific conductance is 900 micromhos ($\mu\text{S}/\text{cm}$), and for total dissolved solids is 500 milligrams per liter (mg/L).

The test results show that your private well water has 1760 $\mu\text{S}/\text{cm}$ specific conductance, and 1100 mg/L total dissolved solids. These levels are higher than the California drinking water standards. High levels of specific conductance and total dissolved solids may affect the taste, odor or appearance of your well water. **However, these compounds do not put your health at risk.**

Follow-up Testing

One water test does not provide enough information to fully understand the safety and quality of your water. For this reason, the Lahontan Regional Water Quality Control Board would like to take another sample of your well water in the near future. They will retest the water for nitrate, specific conductance, and total dissolved solids. Lahontan Regional Water Quality Control Board will provide you with the results of these tests.

Recommendations for Private Well Owners

Many chemicals, metals, minerals and bacteria may be present in private wells and may threaten the safety and quality of your drinking water. These compounds can come from both natural sources and human activity. Private drinking water wells are not regulated or tested by the state, so people with private wells are responsible for making sure that their own drinking water is safe.

We encourage you to have your well water tested routinely to ensure the safety of your drinking water. Since bacteria are the most common problem in private wells, we would suggest that you have your well tested for coliform on a periodic basis. **The Lahontan Regional Water Quality Control Board did not perform a bacteria test on your well water.**

Lastly, California-certified water filters and treatment systems that you can purchase in stores are not intended to treat water with levels of contaminants that are above the health-based drinking water standard. Therefore, we do not recommend that you rely upon these filters and treatment systems to reduce the levels of nitrate, lead, and mercury measured in your well water.

Resident/Property Owner
September 14, 2001
Page 4 of 4

If you have any questions about the information we have provided, please do not hesitate to call Tracy Barreau at (510) 622-4489 or Jackie Schwartz at (510) 622-4487.

Sincerely,

Jackie Schwartz, MPH
Environmental Health Scientist
Environmental Health Investigations Branch

Marilyn Underwood, Ph.D.
Staff Toxicologist
Environmental Health Investigations Branch

Enclosures

cc: Harold Singer, Executive Officer
Lahanton Regional Water Quality Control Board
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South Lake Tahoe, CA 96150

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California Air Resources Board
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Sacramento, CA 95814

Property Owner

DEPARTMENT OF HEALTH SERVICES

1515 CLAY STREET, SUITE 1700
OAKLAND, CA 94612
(510) 622-4500



September 14, 2001

Resident/Property Owner
Hinkley, CA

Dear Resident/Property Owner:

We are writing to provide you with the results of the tests that the Lahontan Regional Water Quality Control Board recently performed on water from your private well (located at **address**). Your private well water was tested because it is located near the area of the groundwater that has been contaminated with chromium 6 (hexavalent chromium) by the Pacific Gas and Electric Company. We (the California Department of Health Services Environmental Health Investigations Branch) recommended that the Lahontan Regional Water Quality Control Board measure the levels of total chromium and chromium 6 in private wells located near the chromium 6 groundwater contamination.

The Lahontan Regional Water Quality Control Board had E.S. Babcock & Sons laboratory measure the levels of total chromium and chromium 6 in your private drinking well water. In order to learn more about the characteristics and quality of the groundwater, they also had NEL laboratories analyze your water for metals, minerals and other inorganic compounds. At high levels, these compounds can make water either unsafe or unpleasant (bad taste, odor or appearance) to drink. Copies of the laboratory reports are included with this letter.

We reviewed the results of the tests that were performed on water from your private well. We also compared the levels of compounds in your water to the levels that are allowed in public drinking water systems. (The state of California regulates public drinking water systems in order to ensure the safety and the quality of public water supplies.)

As we will explain in more detail in the remainder of this letter, the levels of total chromium and chromium 6 in your drinking water do not pose a risk to your health. However, the levels of nitrate, lead, mercury, chloride, specific conductance, sulfate, and total dissolved solids in your water do exceed public drinking water standards and therefore may affect the safety or the quality (taste, odor, appearance) of your well water.

Results for Total Chromium and Chromium 6

The California drinking water standard for total chromium was created in order to ensure that public water supplies are safe to drink. The drinking water standard for total chromium is 50 micrograms per liter ($\mu\text{g/L}$). There is no specific drinking water standard for chromium 6.

Total chromium is made up of chromium 3 (trivalent chromium) and chromium 6. The Lahontan Regional Water Quality Control Board measured the levels of total chromium and chromium 6 in your water. The test results show that your private well water contains 6 $\mu\text{g/L}$ ppb total chromium and 0.53 $\mu\text{g/L}$ chromium 6.

The amount of total chromium in your private well water is below the drinking water standard for total chromium and therefore does not pose a risk to your health.

We have included a fact sheet that provides more information on chromium in drinking water and on the chromium drinking water standard.

Results for Nitrate

The California drinking water standard for nitrate was created to ensure that public water supplies are safe to drink. The drinking water standard for nitrate is 10 milligrams per liter as nitrogen (mg/L-N).

The test results show that the amount of nitrate in your private well water is 62 mg/L-N. This level is greater than the California drinking water standard of 10 mg/L-N. The source of the nitrate contamination of your well water is unknown; however, nitrate is commonly found in water supplies, especially in agricultural areas.

Pregnant women and young infants who drink water contaminated with high levels of nitrate are the most at risk of developing serious health problems. However, these health problems will stop once you are no longer exposed to nitrate. **If you are pregnant or have a young infant (under six months old), we recommend that you use different water (for example, municipal or bottled water) for drinking, cooking, and making infant formula.**

We have included a brochure that provides more information on nitrate. The brochure is titled "Health Concerns Related to Nitrate and Nitrite in Private Well Water."

Resident/Property Owner
September 14, 2001
Page 3 of 6

Results for Lead

The California drinking water standard for lead was created to ensure that public water supplies are safe to drink. The drinking water standard for lead is 0.015 milligrams per liter (mg/L).

The test results show that the amount of lead in your private well water is 0.089 mg/L. The amount of lead in your water is higher than the California drinking water standard of 0.015 mg/L.

Children under six years old are at the highest risk for lead poisoning. Lead poisoning can harm the brain, nerves and kidneys of a young child and make it very hard for a child to learn, pay attention, and behave. Most children with lead poisoning do not look or act sick.

There are many ways that children may be exposed to lead, including air, water, dust, soil and older paints that contain lead. We have included two brochures that provide more information on childhood lead poisoning and the ways that children may be exposed to lead.

A child who drinks water from your well and who is also exposed to lead from other common sources may be exposed to greater amounts of lead than is recommended. **If you have a young child who drinks water from your well, or if you have other sources of lead exposure in your home (for example, paint manufactured before 1978), we recommend that you use different water (municipal or bottled). We also recommend that the child have a blood lead test.** The blood lead test is the only way to know if your child has lead poisoning. Your doctor or clinic can give your child a blood lead test. You may also call the San Bernardino County Childhood Lead Poisoning Prevention Program at (909) 387-6305 for further information on lead poisoning and the blood lead test.

The source of the lead contamination is currently unknown. Because water was taken from your well and not from inside your house, we do know that the source of the lead contamination is not your plumbing. The lead in your water could be coming from a material that was used to construct your well or from an outside source that has contaminated the groundwater in your area. We recommend that you ask your well constructor if lead solder was used to construct your well. This information should be recorded in the drill records for your well.

Results for Mercury

The California drinking water standard for inorganic mercury was created to ensure that public water supplies are safe to drink. The drinking water standard for inorganic mercury is 0.002 mg/L.

The test results show that the amount of inorganic mercury in your private well water is 0.0029 mg/L. This level is above the California drinking water standard of 0.002 mg/L.

Exposure to very high levels of inorganic mercury salts can damage the kidney and nervous system. Young children are more at risk for health problems than adults because mercury is more easily absorbed into their bodies. **Because the level of mercury in your well water is above the drinking water standard, we recommend that you use water from a different source (bottled, municipal) for drinking and cooking.**

The source of the mercury contamination in your well water is currently unknown. Mercury is used in batteries, and in some paints, pesticides and chemicals. If any of these items spill or are improperly disposed of near your well, the mercury in them can move through the soil and reach the water in your well. **We recommend that you continue to test for mercury in your well water (in order to better understand the contamination) and that you try to identify the source of the mercury contamination.**

Results for Chloride, Specific Conductance, Sulfate, and Total Dissolved Solids

The drinking water standards for chloride, specific conductance, sulfate, and total dissolved solids were created in order to protect the quality (taste, odor, appearance) of public water supplies. The standard for chloride is 250 mg/L, for specific conductance is 900 micromhos ($\mu\text{S}/\text{cm}$), for sulfate is 250 mg/L and for total dissolved solids is 500 mg/L.

The test results show that your private well water has 930 mg/L chloride, 4910 $\mu\text{S}/\text{cm}$ specific conductance, 880 mg/L sulfate, and 3490 mg/L total dissolved solids. These levels are higher than the California drinking water standards. High levels of chloride, specific conductance, sulfate and total dissolved solids may affect the taste, odor or appearance of your well water. **These compounds do not put your health at risk.**

Resident/Property Owner
September 14, 2001
Page 5 of 6

Follow-up Testing

One water test does not provide enough information to fully understand the safety and quality of your water. For this reason, the Lahontan Regional Water Quality Control Board would like to take another sample of your well water in the near future. They will retest the water for nitrate, lead, mercury, chloride, specific conductance, sulfate, and total dissolve solids. Lahontan Regional Water Quality Control Board will provide you with the results of these tests.

Recommendations for Private Well Owners

Many chemicals, metals, minerals and bacteria may be present in private wells and may threaten the safety and quality of your drinking water. These compounds can come from both natural sources and human activity. Private drinking water wells are not regulated or tested by the state, so people with private wells are responsible for making sure that their own drinking water is safe.

We have recommended that you do not use your well water for drinking and cooking. **Should you switch to a different or a new well, we encourage you to routinely test that well to ensure the safety of your drinking water.** Since bacteria are the most common problem in private wells, we would suggest that you also have the water tested for coliform.

Lastly, California-certified water filters and treatment systems that you can purchase in stores are not intended to treat water with levels of contaminants that are above the health-based drinking water standard. Therefore, we do not recommend that you rely upon these filters and treatment systems to reduce the levels of nitrate, lead, and mercury measured in your well water.

If you have any questions about the information we have provided, please do not hesitate to call Tracy Barreau at (510) 622-4489 or Jackie Schwartz at (510) 622-4487.

Sincerely,

Jackie Schwartz, MPH
Environmental Health Scientist
Environmental Health Investigations Branch

Marilyn Underwood, Ph.D.
Staff Toxicologist
Environmental Health Investigations Branch

Resident/Property Owner

September 14, 2001

Page 6 of 6

Enclosures

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South Lake Tahoe, CA 96150

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Property Owner

Appendix E

Fact Sheet on Chromium in Drinking Water

Prepared by: California Department of Health Services, Division of Drinking Water and Environmental Management and California Environmental Protection Agency, Office of Environmental Health Hazard Assessment



FACT SHEET

CALIFORNIA DEPARTMENT OF HEALTH SERVICES AND
OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT

DHS/OEHHA FACT SHEET ON CHROMIUM IN DRINKING WATER

Recent testing has found detectable levels of chromium, particularly chromium 6, also known as hexavalent chromium, in drinking water in Los Angeles County and other areas of California. The California Department of Health Services (DHS) and the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA) have prepared this fact sheet to answer basic questions about chromium in drinking water.

Q: *What is chromium?*

A: Chromium is a metallic chemical that occurs naturally in some deep aquifers, but can also enter drinking water sources through discharges of dye and paint pigments, wood preservatives, chrome plating liquid wastes and leaching from hazardous waste sites. Chromium may be present in drinking water sources in two forms: trivalent chromium (chromium 3) and hexavalent chromium (chromium 6). Chromium 3 is found naturally in foods at low levels and is an essential human dietary nutrient. Chromium 6 is the more toxic form of chromium, often found as chromate.

Q. *Is chromium hazardous?*

A: Yes. Chromium 6 is known to cause cancer in humans when inhaled. The hazards of airborne chromium 6 in the workplace environment have been extensively documented. A number of scientific studies have found elevated rates of lung cancer in workers with occupational exposure to chromium 6 by inhalation. A few studies of workers exposed to chromium 6 by inhalation have shown an increase in cancers of the gastrointestinal tract. There is substantial evidence from laboratory studies that chromium 6 can damage DNA and is a mutagen. There is limited evidence from a single laboratory study using mice that oral ingestion of high levels of chromium 6 may cause cancer in the gastrointestinal tract. There continues to be uncertainty in the scientific community whether or not chromium 6 can cause cancer when ingested at levels found in drinking water. Current scientific evidence indicates that chromium 6 is likely to be much more toxic when inhaled than when ingested.

In contrast, chromium 3 has relatively low toxicity and would be a concern in drinking water only at very high levels of contamination much greater than is allowed in California drinking water. Chromium 3 is an essential dietary element with a minimum daily requirement that ranges from 50 to 200 micrograms per day for an adult.

Q: What is the PHG for chromium 6?

A: There is no PHG for chromium 6. In 1998, OEHHA developed a PHG for total chromium of 2.5 ppb. The PHG for total chromium was calculated based on scientific information on the potential carcinogenicity of ingested chromium 6, along with an estimate that chromium 6 comprised about 7 percent of the total chromium in water. This estimate was based on the best available data at the time. Recent studies of chromium 6 in a limited number of California water supplies indicate this percentage can be much higher; perhaps greater than 50 percent. The recently adopted regulation requiring statewide testing will help to identify the levels of chromium 6 in California drinking water supplies.

Q: Is DHS going to adopt a drinking water standard for chromium 6?

A: DHS intends at this time to develop the nation's first drinking water standard for chromium 6. DHS has initiated the first step in this process by asking OEHHA to develop a PHG for chromium 6. The California Environmental Protection Agency, on behalf of OEHHA, has requested the University of California to form a scientific panel to provide guidance to OEHHA in establishing a chromium 6 PHG. At the same time, DHS has taken steps to obtain more information on the prevalence of chromium 6 in drinking water supplies. This information will enable DHS to develop data on cost and feasibility of treatment that must be considered as part of the development of a chromium 6 drinking water standard.

In March 1999, DHS gave notice that it would be evaluating the total chromium drinking water standard to determine if the standard should be revised. After an initial review, DHS determined that there needed to be a better understanding of the distribution of chromium 3 and chromium 6 in drinking water in the state. DHS collected recent information on chromium 6 from water systems that had been sampling for the chemical. In August 1999, DHS began conducting its own chromium 6 sampling study at a limited number of water systems in various regions of the state. As a result of that work, DHS concluded that it needed additional information on the statewide occurrence of chromium 6 in drinking water before it could adequately determine a new standard. Consequently, DHS adopted regulations effective January 2001 to require statewide monitoring for chromium 6 by water systems.

Following the approval of Senate Bill (SB) 2127 by the Legislature in August 2000, DHS has been working with water systems in the San Fernando Valley to develop information on the levels of chromium 6 in drinking water provided to the Valley residents. With these data, DHS and OEHHA will be able to assess exposure and risks to the Valley residents, as required by the bill. SB 2127 requires that a report on the assessment be submitted to the Legislature by January 2002.

Q: Is drinking water with levels of chromium 6 higher than the PHG for total chromium (2.5 ppb) safe to drink?

A: Yes. There is no immediate health threat from chromium in drinking water that meets current drinking water standards. The potential health risks from chromium 6 calculated in the PHG are based on a lifetime (70 years) of exposure from drinking two liters of water per day.

For more information on chromium in California's drinking water, please visit the DHS web site at <http://www.dhs.ca.gov/ps/ddwem/chemicals/Chromium6/Cr+6index.htm>. To view or download OEHHA's PHG for chromium, please visit the OEHHA web site at www.oehha.ca.gov/water/phg/pdf/chrom_f.pdf.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see DHS's Web-site at www.dhs.ca.gov, or OEHHA's Web-site at www.oehha.ca.gov/public_info.html.

Appendix F

Information Brochure: Lead Poisoning and Your Children

Prepared by:
United States Environmental Protection Agency

Lead awareness and your children

About 1 in 22 children in America have high levels of lead in their blood, according to the Centers for Disease Control and Prevention. You may have lead around your building without knowing it because you can't see, taste, or smell lead. You may have lead in the dust, paint, or soil in and around your home, or in your drinking water or food. Because it does not break down naturally, lead can remain a problem until it is removed.

Before we knew how harmful it could be, lead was used in paint, gasoline, water pipes, and many other products. Now that we know the dangers of lead, house paint is almost lead-free, leaded gasoline has been phased out, and household plumbing is no longer made with lead materials.

How lead affects your child's health

The long-term effects of lead in a child can be severe. They include learning disabilities, decreased growth, hyperactivity, impaired hearing, and even brain damage. If caught early, these effects can be limited by reducing exposure to lead or by medical treatment. If you are pregnant, avoid exposing yourself to lead. Lead can pass through your body to your baby. The good news is that there are simple things you can do to help protect your family.

1. Get your child tested.

Even children who appear healthy may have high levels of lead. You can't tell if a child has lead poisoning unless you have him or her tested. A blood test takes only ten minutes, and results should be ready within a week.

Blood tests are usually recommended for:

- ✓ Children at ages 1 and 2.
- ✓ Children or other family members who have been exposed to high levels of lead.



- ✓ Children who should be tested under your state or local screening plan.

To find out where to have your child tested, call your doctor or local health clinic. They can explain what the test results mean, and if more testing will be needed.

2. Keep it clean.

Ordinary dust and dirt may contain lead.

Children can swallow lead or breathe lead contaminated dust if they play in dust or dirt and then put their fingers or toys in their mouths, or if they eat without washing their hands first.

- ✓ Keep the areas where your children play as dust-free and clean as possible.
- ✓ Wash pacifiers and bottles after they fall on the floor. Keep extras handy.
- ✓ Clean floors, window frames, window sills, and other surfaces weekly. Use a mop, sponge, or paper towel with warm water and a general all-purpose cleaner or a cleaner made specifically for lead. REMEMBER: NEVER MIX AMMONIA AND BLEACH PRODUCTS TOGETHER SINCE THEY CAN FORM A DANGEROUS GAS.
- ✓ Thoroughly rinse sponges and mop heads after cleaning dirty and dusty areas.
- ✓ Wash toys and stuffed animals regularly.

- ✓ Make sure your children wash their hands before meals, nap time, and bedtime.

3. Reduce the risk from lead paint.

Most homes built before 1960 contain leaded paint. Some homes built as recently as 1978 may also contain lead paint. This paint could be on window frames, walls, the outside of your house, or other surfaces. Tiny pieces of peeling or chipping paint are dangerous if eaten. Lead paint in good condition is not usually a problem except in places where painted surfaces rub against each other and create dust. (For example, when you open a window, the painted surfaces rub against each other.)

- ✓ Make sure your child does not chew on anything covered with lead paint, such as painted window sills, cribs, or playpens.
- ✓ Don't burn painted wood. It may contain lead.

4. Don't remove lead paint yourself

Families have been poisoned by *scraping* or *sanding lead paint* because these activities generate large amounts of lead dust. Lead dust from repairs or renovations of older buildings can remain in the building long after the work is completed. Heating paint may release lead into the air.

- ✓ Ask your local or state health department if they will test your home for lead paint. Some will test for free. Home test kits *cannot* detect small amounts of lead under some conditions.
- ✓ Hire a person with special training for correcting lead paint problems to remove lead paint from your home, someone who knows how to do this work safely and has.

the proper equipment to clean up thoroughly. Don't try to remove lead paint yourself.

- ✓ All occupants, especially children and pregnant women, should leave the building until all work is finished and a thorough cleanup is done.
- 5. Don't bring lead dust into your home.**
- If you work in construction, demolition or painting, with batteries, or in a radiator repair shop or lead factory, or if your hobby involves lead, you may unknowingly bring lead into your home on your hands or clothes. You may also be tracking in lead from the soil around your home. Soil very close to homes may be contaminated from lead paint on the outside of the building. Soil by roads or highways may be contaminated from years of exhaust fumes from cars and trucks that used leaded gas.

- ✓ If you work with lead in your job or hobby, change your clothes and shower before you go home.
- ✓ Encourage your children to play in sand or grassy areas instead of dirt which sticks to fingers and toys. Try to keep your children from eating dirt, and make sure they wash their hands when they come inside.

6. Get lead out of your drinking water.

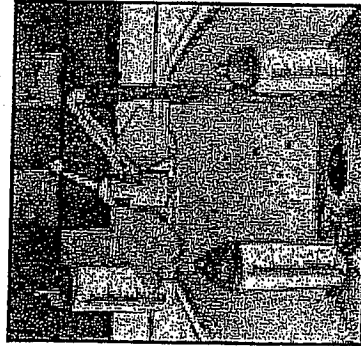
Most well or city water does not naturally contain lead. Water usually picks up lead *inside your home* from household plumbing that is made with lead materials. Boiling the water will not reduce the amount of lead. Bathing is not a problem because lead does not enter the body through the skin.

✓ *The only way to know if you have lead in your water is to have it tested.* Call your local health department or your water supplier to see how to get it tested.

✓ Household water will contain more lead if it has sat for a long time in the pipes, is hot, or is naturally acidic.

✓ If you think your plumbing might have lead in it:

- 1) Use only cold water for drinking, cooking, and making baby formula.
- 2) Run water for 15 to 30 seconds before drinking it, especially if you have not used your water for a few hours.
- 3) Call EPA's Safe Drinking Water Hotline for more information.



7. Eat right.

A child who gets enough iron and calcium will absorb less lead. Foods rich in iron include eggs, lean red meat, and beans. Dairy products are high in calcium.

- ✓ Don't store food or liquid in lead crystal glassware or imported or old pottery.
- ✓ If you reuse plastic bags to store or carry food, keep the printing on the outside of the bag.

United States
Environmental Protection
Agency
EPA 747 (600-100)
October 2000

Office of Pollution Prevention and Toxics (7404)

EPA Lead Poisoning And Your Children



Appendix G

Information Brochure: Lead Poisoning: Are Your Children in Danger?

Prepared by:

California Department of Health Services, Child Health and Disability Prevention Program and
Childhood Lead Poisoning Prevention Branch

La Intoxicación de Plomo en la Sangre

¿Están sus hijos en peligro?



Es posible que sus hijos padezcan de intoxicación de plomo en la sangre, y no lo sepan, ni actúen como si estuvieran enfermos.

La intoxicación de plomo en la sangre puede retrasar el crecimiento de sus hijos y ocasionarles problemas de aprendizaje y comportamiento.

Los niños menores de 6 años son los que corren el mayor riesgo de intoxicación de plomo en la sangre.

Pídale a su doctor que examine la sangre de su hijo para ver si contiene plomo. Esta es la única manera de saber si su hijo padece de intoxicación

El plomo se puede encontrar en la pintura de las casas construidas antes de 1960, y en la tierra alrededor de estas casas.



Cosas que puede hacer:

Limpie a fondo las cáscaras de pintura y polvo con un trapeador o un trapo mojados. No raspe, lije, queme o barra la pintura. Lave las manos y caras de sus hijos después de que éstos jueguen afuera o en el piso.

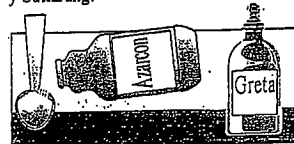
El plomo se puede encontrar en los platos decorados e importados o en la alfarería o cerámica hechas a mano.



Cosas que puede hacer:

Utilice platos y tazas de plástico o vidrio sin adornos. No use cerámica para preparar, cocinar o almacenar alimentos y bebidas.

El plomo se puede encontrar en los remedios caseros como el Azarcón, Greta, Pay-loo-ah, Kohl, Kandu, Baia Goli, Ghasard, Cerussite, Sema, y Sattarang.



Cosas que puede hacer:

¡De inmediato deje usar remedios caseros! Consulte con su doctor o enfermera.

El plomo se puede encontrar en quehaceres o pasatiempos en que se utilicen vidrio emplomado, pesas para pescar, pintura, radiadores, baterías de auto, y en la tierra cerca de las autopistas, fundiciones, y fábricas.



Cosas que puede hacer:

Bañarse, lavarse y cambiarse de zapatos y ropa después de trabajar con estos materiales. Lave la ropa de trabajo separadamente de la otra ropa. Mantenga a los niños alejados de artículos que podrían contener plomo.

Una alimentación saludable puede ayudar a proteger a sus hijos de la intoxicación de plomo en la sangre.

Siempre lave las manos y las caras de sus hijos antes de comer.

Comer alimentos que contienen calcio puede ayudar a reducir el riesgo de intoxicación de plomo en la sangre.

■ Comidas ricas en calcio: leche, queso, yogur, leche de soja, etc.

■ Alimentos que contienen hierro: carne roja, pollo, pescado, etc.

■ Alimentos que contienen vitamina C: frutas cítricas, tomates, etc.

■ Alimentos que contienen zinc: carne, mariscos, etc.

■ Alimentos que contienen vitamina E: aceites vegetales, etc.

■ Alimentos que contienen vitamina K: verduras de hoja verde, etc.

■ Alimentos que contienen vitamina B12: carne, leche, etc.

■ Alimentos que contienen vitamina D: leche, etc.

■ Alimentos que contienen vitamina A: zanahorias, etc.

■ Alimentos que contienen vitamina B6: carne, etc.

■ Alimentos que contienen vitamina B9: verduras, etc.

■ Alimentos que contienen vitamina C: frutas cítricas, etc.

■ Alimentos que contienen calcio: leche, queso, etc.

■ Alimentos que contienen hierro: carne, etc.

■ Alimentos que contienen zinc: carne, etc.

■ Alimentos que contienen vitamina E: aceites, etc.

■ Alimentos que contienen vitamina K: verduras, etc.

■ Alimentos que contienen vitamina B12: carne, etc.

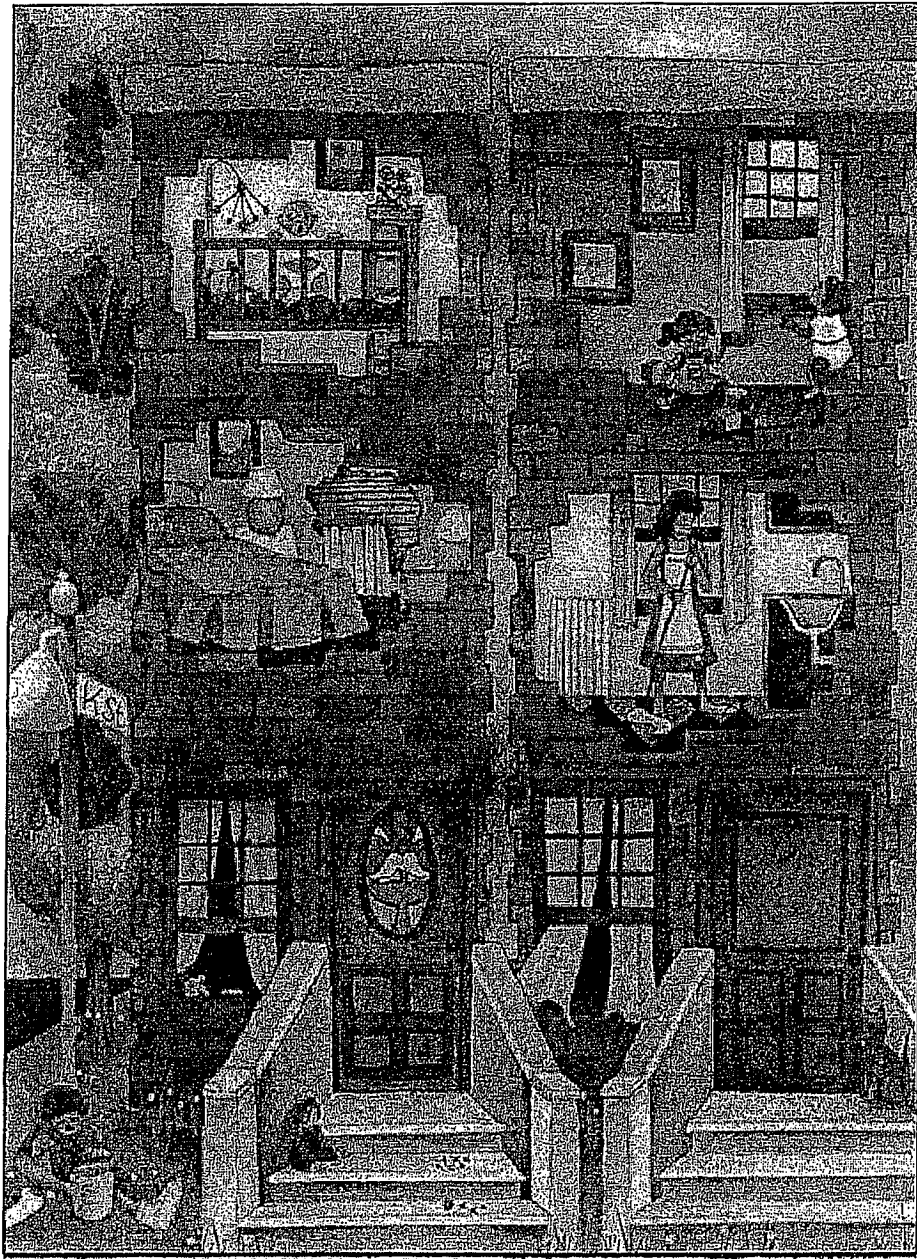
■ Alimentos que contienen vitamina D: leche, etc.

Para averiguar acerca de los exámenes de sangre para saber el contenido de plomo, y si reúne los requisitos para recibir exámenes de la salud, llame a su doctor, clínica, o al Programa del Departamento de Salud para la Prevención de la Intoxicación de Plomo en la Sangre de Niños y Adolescentes (CIP).

Desarrollado por los Educadores de Salud y la Administración de Salud y Seguridad, División de Prevención de la Intoxicación de Plomo en la Sangre.

Protect Your Children From Lead Poisoning

- 1** Get your child tested for lead poisoning, even if he or she seems healthy.
- 2** Clean floors, window frames, window sills, and other surfaces weekly. Use a mop, sponge, or paper towel with warm water and a general all-purpose cleaner or a cleaner made specifically for lead.
- 3** Reduce the risk of lead paint. Make sure your child is not chewing on anything covered with lead paint.
- 4** Don't try to remove lead paint yourself.
- 5** Don't bring lead dust into your home from work or a hobby.
- 6** Have your water tested. If the cold water hasn't been used for more than a few hours, let it run for 15-30 seconds before drinking it or cooking with it.
- 7** Eat right and don't store food in high-lead pottery.



Lead poisoning is a serious problem for young children—the younger the child, the greater the risk.

For More Information

EPA's Safe Drinking Water Hotline

1-800-426-4791

National Lead Information Center

1-800-424-LEAD

Visit our web site

<http://www.epa.gov/lead>

United States Environmental Protection Agency • Office of Pollution Prevention and Toxics • Office of Ground Water and Drinking Water

Appendix H

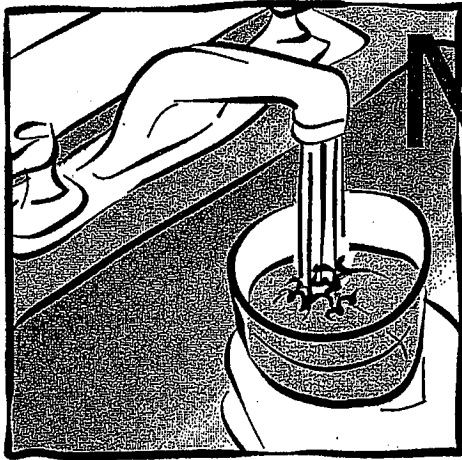
Fact Sheet: Health Concerns Related to Nitrate and Nitrite in Private Well Water

Prepared by:

California Department of Health Services, Environmental Health Investigations Branch

FEBRUARY 2000

HEALTH CONCERNS RELATED TO NITRATE AND NITRITE IN PRIVATE WELL WATER



Nitrate and nitrite are two chemicals that are sometimes found in private well water. Infants who drink water containing elevated levels of nitrate can develop serious health problems. This fact sheet provides information about these chemicals and includes steps you can take to protect your family's health if your drinking water contains unsafe levels of nitrate and nitrite.

How are You and Your Family Exposed to Nitrate and Nitrite in Drinking Water?

Elevated nitrate levels in drinking water are often caused by groundwater contamination from animal waste run-off from dairies and feedlots, excessive use of fertilizers, or seepage of human sewage from private septic systems. Microorganisms in the soil, water and sewage change the nitrate to nitrite.

How Does Nitrite Affect the Body

Nitrite is of particular health concern in the body because it causes the hemoglobin in the blood to change to **methemoglobin**. Methemoglobin reduces the amount of oxygen that can be carried in the blood. This results in cells throughout the body being deprived of sufficient oxygen to function properly. This condition is called **methemoglobinemia**.

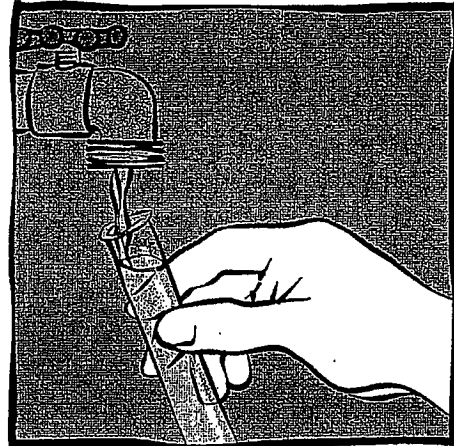
Infants and Methemoglobinemia

Infants, particularly those under six months of age, are the most at risk of developing serious health problems from drinking water that contains elevated levels of nitrate or nitrite. This is because there are differences between the bodies and behaviors of infants and adults or older children.

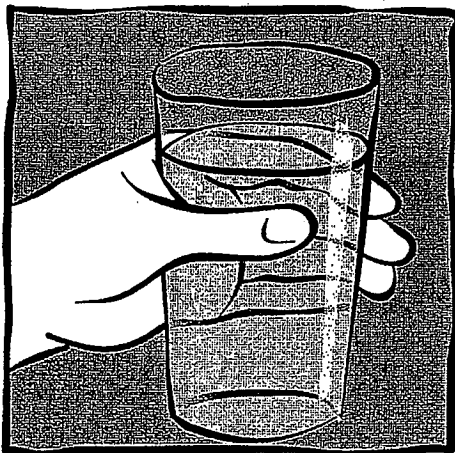
NITRATE IN WELL WATER AND WHAT TO DO ABOUT IT

If You Use Private Well Water, Have Your Water Tested

Public water systems are tested to insure that they conform to certain drinking water standards, but there are no requirements about the testing of private wells. It is especially critical that you have your water tested if you have an infant, or someone who is planning to become pregnant, in your household. In any case, it's a good idea to have your water tested at least once a year, between April and July when nitrate and nitrite levels are typically the highest. In addition, it is also important to have your well tested once a year for bacteria. If there are changes in the taste, odor or appearance of the water, it should be tested as soon as possible.



If your water comes from a private well and you do not know if there are elevated levels of nitrate and nitrite in the water, your local county environmental health department will be able to refer you to a certified laboratory that can test your water for the levels of nitrate and nitrite. These tests cost approximately \$50. The environmental health department should also have information about the typical levels of nitrate in the groundwater in the area where you live.

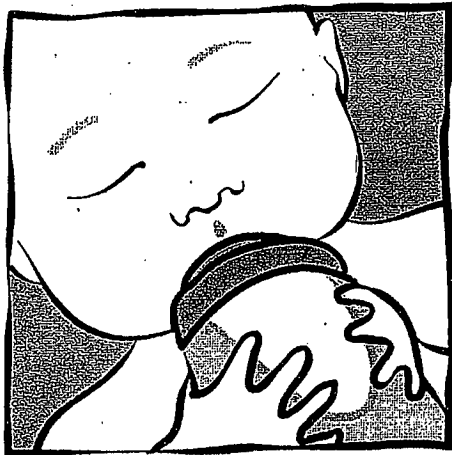


How Much Nitrate is Allowed in Drinking Water?

The federal and state governments have set standards for drinking water. These standards, called "Maximum Contaminant Levels" (MCLs), define levels of certain chemicals that are allowed in the drinking water and are not expected to cause any harmful health effects to humans. The standards for nitrate and nitrite have been set at levels which should not cause methemoglobinemia in infants.

What Do Well Water Test Results Mean?

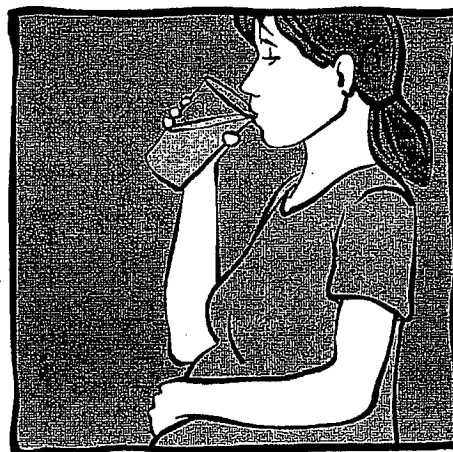
If you decide to have your water tested, the results could be confusing because they can be presented in several different ways. The level of nitrate or nitrite in water can be reported in two different units of measurement: milligrams of nitrate per liter of water (mg/L) or parts of nitrate per million parts of water (ppm). Nitrate can also be reported as "nitrate as nitrogen" and nitrite can be reported



Infants have relatively low acidity in their stomachs compared to adults. This allows for the growth of certain bacteria that readily convert nitrate to nitrite, which in turn causes methemoglobinemia. In infants, this is commonly called Blue Baby Syndrome, because the lack of oxygen causes the baby's skin to turn a bluish color, particularly around the eyes and mouth. If untreated, infants can die from this condition.

Pregnant Women and Methemoglobinemia

During pregnancy, it is common for methemoglobin levels of the pregnant woman to increase from normal (where 0.5 to 2.5% of the total hemoglobin is in the form of methemoglobin) to a maximum of 10% in the 30th week of pregnancy. The level of methemoglobin declines to a normal level after delivery. Therefore, pregnant women are particularly susceptible to methemoglobinemia and should be sure that the nitrate and nitrite in their well water is at safe levels. (These levels will be discussed later in the fact sheet.)



Effect of Nitrate/Nitrite on Development of the Fetus and the Birth Process

There is no clear evidence that appreciable amounts of nitrate can be transferred to the fetus from the pregnant woman. Although the mother may be experiencing methemoglobinemia, the fetus may not be directly affected. There have not been many studies which look at the effect of nitrate and nitrite on pregnancy or on the normal development of a fetus. Some studies of laboratory animals, where nitrate/nitrite levels are very high, have found a potential negative impact on reproductive and developmental systems. There is also little indication that breastfed infants would develop methemoglobinemia from exposure to nitrate and nitrite through breastmilk.

Does Exposure to Nitrate Cause Cancer?

There is no evidence that nitrate or nitrite causes cancer in laboratory animals or humans. Studies have shown that diets lacking dietary fiber and including foods with high levels of nitrate and nitrite such as smoked meats, may promote stomach cancers. However, studies have not indicated that drinking water high in nitrate is associated with stomach cancer.

as "nitrite as nitrogen." The table to the right shows the different ways MCLs are reported and the allowable levels of nitrate and nitrite. To determine if the level of nitrate/nitrite in your water is safe, compare your test results to the MCL in the table that uses the same reporting method. If the level is below the MCL,

then the water is considered safe to drink. One water sample may not take into account fluctuations in nitrate concentrations over time. Therefore, to be cautious, infants and pregnant women may wish to avoid drinking tap water if the levels of nitrate and nitrite are close to the MCL.

Reporting Method	Maximum Contaminant Level (MCL)	
	Nitrate	Nitrite
mg/L	45	3.3
ppm	45	3.3
as nitrogen (mg/L)	10	1.0
as nitrogen (ppm)	10	1.0

WHAT CAN I DO IF LEVELS OF NITRATE OR NITRITE IN MY WELL WATER ARE ABOVE THE MCL?

If the levels of nitrate or nitrite are above the MCL, you have several options:

- Use bottled water for drinking and cooking, and limit well water usage to bathing and showering.
- Check with the county environmental health department about the possibility of getting hooked up to a public water system.
- Consider treatment methods either at the wellhead or the tap. For information, contact the Water Treatment Device Certification Unit of the California Department of Health Services in Sacramento at (916) 327-1140.

Do not boil the water to get rid of nitrate or nitrite. This will actually increase the concentration of chemicals in the water.

RECOMMENDATIONS

- Have your private well water tested for the levels of nitrate and nitrite.
- If your water exceeds or comes close to the MCL (as shown in the table):
 - Do not use well water to make formula for infants under six months.
 - Do not drink well water if you are pregnant.

If you have questions about this fact sheet, or are having trouble contacting your local environmental health department, please call Judy Lewis, Environmental Health Investigations Branch, California Department of Health Services at (510) 622-4490.



Memorandum

Date April 25, 2003

From Chief, Program Evaluation, Records, and Information Services Branch, DHAC, ATSDR

Subject Health Consultation

To William Q. Nelson
Senior Regional Representative, ATSDR, Region IX

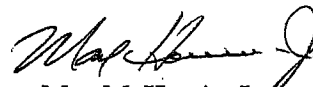
Enclosed please find twenty copies of the April 22, 2003, health consultation on the following site prepared by the California Department of Health Services, under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR).

PACIFIC GAS AND ELECTRIC FACILITY
HINKLEY, SAN BERNARDINO COUNTY, CALIFORNIA
EPA FACILITY ID: CA0000206656

The Program Evaluation, Records, and Information Services Branch requires copies of all letters used to transmit this document to the agencies, departments, or individuals on your distribution list. The copy letters will be placed into the administrative record for the site and serve as the official record of distribution for this health consultation.

Please address correspondence to the Chief, Program Evaluation, Records, and Information Services Branch, Division of Health Assessment and Consultation, ATSDR, Mailstop E-60, 1600 Clifton Road, NE, Atlanta, Georgia 30333.

If you have any questions, please direct them to Tammie McRae, the technical project officer, at (404) 498-0437.


Max M. Howie, Jr.

Enclosures

cc: B. Rogers R. C. Williams R. Gillig T. McRae
S. Lopez P. Zeitz M. Underwood, CADOHS

You May Contact ATSDR TOLL FREE at
1-888-42ATSDR or
Visit our Home Page at: <http://www.atsdr.cdc.gov>