

FACTS



Private Well Testing



Division of Environmental and Occupational Health Services
Consumer and Environmental Health Services

FACTS Private Well Testing

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INTRODUCTION

- About 10% of New Jersey residents get their drinking water from private wells. While public water supplies are protected under the State and federal Safe Drinking Water Acts, private well owners are solely responsible for monitoring the quality of their own well water and for maintaining their own well.
- Regular water testing is an important step that private well owners can take to ensure that their water supply is both safe to drink and appealing to use.
- Older private wells are often more susceptible to contamination than public water supply wells since they tend to be shallower, less carefully constructed, and located too close to common sources of contamination, such as household septic systems.
- A variety of water testing services are available from New Jersey certified commercial laboratories. In addition, some local health departments provide low cost testing services.
- Private well owners are responsible for making sure that their well is working correctly. Proper well design, construction, and maintenance help to protect your drinking water supply, ensuring that it will be appealing in taste with no odor or color and will not be harmful to drink. In New Jersey, individuals who install private wells must now be licensed and follow strict construction standards.



WHY SHOULD YOU TEST YOUR WELL WATER?

You should feel confident that your well water is safe to drink and acceptable for other household uses.

Regular testing will provide you with assurances that your water does not contain unacceptable levels of contaminants that may be harmful to your health and the health of your family.

There may be known or suspected well water contamination in your area.

Regular testing can help you to observe changes in water quality over time and identify problems *before* they negatively affect your water supply and health. Even if you currently have a safe water supply, periodic testing can establish a record of your water quality over time which can be useful in solving problems that may occur in the future and in obtaining compensation if someone damages your water supply.

Even if your well water appears to be problem-free, it may not necessarily be acceptable to drink.

The cause of recurrent incidences of waterborne illness may go undetected when your water shows no obvious signs of contamination. Regular testing can help you identify the presence of contaminants in your water that may otherwise go unnoticed.

Some members of your household may be more likely to experience harmful health effects from

contaminants in your well water. Infants and young children, people with weakened immune systems, pregnant women, and the elderly are particularly vulnerable to water contamination. It is especially important to test your water regularly if any of these individuals are living in your household.



Certain factors may make your private well susceptible to contamination. Many factors, including well design, construction, and location, will help to determine the likelihood that your well will become contaminated. Once you evaluate to what extent your well is at risk of contamination, you can establish a regular testing schedule suitable to your specific situation in order to monitor your water quality.

Naturally-occurring substances in the ground can result in an unpleasant taste, smell, and appearance of your well water, or in stained clothes and plumbing fixtures.

Regular testing for substances, such as iron, copper, and manganese, will help you to identify contaminants that affect the aesthetic qualities of your well water and select proper treatment methods designed to eliminate these inconveniences.

Your local health department may require private well testing under certain circumstances, such as for a new well or during a real estate transfer. Some local health departments require you to test your well before using it for the first time or when you buy a home in order to protect you from unnecessary and

unknowing exposure to water contamination.

Thereafter, regular well testing has the added benefit of establishing a record of your water quality over time and providing potential buyers with valuable information if

you ever want to sell your home.

Regular testing can be helpful for monitoring the effectiveness of a home water treatment unit. Most home water treatment units require regular maintenance. A change in water quality may indicate that your treatment unit is not working properly or that a change in treatment is needed.



WHAT ARE THE MOST COMMON SOURCES OF WELL WATER CONTAMINATION?

There are many substances that can negatively affect the quality of your well water. Some are found naturally in the environment while others result from human activities. The most common sources of well water contamination in New Jersey include:

Infectious Microorganisms, such as bacteria, viruses, and protozoa, are naturally found in human and animal wastes. They can enter your well water from faulty household septic systems or nearby animal feedlots.

Nitrates often come from the natural breakdown of human and animal wastes. They are also found in chemical fertilizers. Nitrates can enter your well water from faulty household septic systems, nearby farms, home fertilizer use and municipal landfills.

Contact your local health department or NJDHSS for more information about these and other common well water contaminants.

Lead was used in the past to make household plumbing materials. Lead pipes and solder can still be found in many older homes. Small amounts of lead are also found in brass faucets and in some well pumps. Lead can enter your well water from household plumbing as water travels from the well to your tap, especially if your water is acidic. Other sources of lead include municipal landfills, and industrial facilities and waste sites.

Other contaminants that are sometimes found in well water typically come from the following sources:

Contaminant	Examples	Common Sources
Inorganic compounds	Mercury	household septic systems municipal waste landfills industrial facilities hazardous waste sites
Organic compounds	Volatile Organic Compounds (VOCs) ¹	household septic systems underground storage tanks gas stations municipal waste landfills dry-cleaning facilities industrial facilities hazardous waste sites
	Pesticides	farms residential areas golf courses
Radionuclides	Uranium Radium Radon ²	rocks and soils industrial facilities hazardous waste sites

¹ **VOCs** commonly found in drinking water include benzene, carbon tetrachloride, dichloroethane, dichloroethylene, tetrachloroethylene, trichloroethane, trichloroethylene and vinyl chloride. VOCs can be released into indoor air when you use your well water.

² **Radon** comes from the radioactive decay of uranium and radium in rock. Radon gas can move through the soil into your well water, and be released into indoor air when you use the water.

WHAT HEALTH EFFECTS ARE ASSOCIATED WITH WELL WATER CONTAMINANTS?

The health effects of the most common drinking water contaminants include:

Infectious Microorganisms can cause symptoms such as nausea, vomiting, diarrhea, and stomach cramps. In healthy adults, these effects are usually mild and do not last long. Infants, children, the elderly, and individuals with weakened immune systems may have more severe symptoms.

Nitrates can interfere with the blood's ability to carry oxygen throughout the body resulting in a type of anemia called methemoglobinemia. In infants, this condition is called "blue baby syndrome." Infants, young children, pregnant women and women considering pregnancy should avoid exposure to nitrates.

Lead is easily absorbed and stored by the body causing learning, behavioral, and developmental problems in infants and young children. Women should avoid exposure to lead during pregnancy. Lead can reach the unborn child through the bloodstream resulting in premature births, smaller babies at birth, and decreased mental ability in infants.



Other contaminants that are sometimes found in well water are associated with the following health effects:

Contaminant	Examples	Health Effects ¹
Inorganic compounds	Mercury	Nervous system and kidney damage
Organic compounds	Volatile Organic Compounds (VOCs) ²	Effects of exposure to low levels are not well understood. In the workplace, high levels of exposure have been found to cause liver, kidney, and nervous system disorders, irregular heartbeat, high blood pressure, anemia and cancer.
	Pesticides	Birth defects and increased risk of cancer
Radionuclides	Uranium Radium Radon ³	Long-term exposure to radium in water is believed to increase the risk of developing bone cancer and cancer of the head sinuses. Radon gas in indoor air has been linked with lung cancer, and smokers are at highest risk.

¹ **Health effects** can be either acute (short-term) or chronic (long-term). Acute effects occur almost immediately upon exposure. Chronic effects result from exposure to small amounts of a substance over a long period of time. Exposure to chemical contaminants in drinking water is more likely to result in chronic effects than in acute effects.

² **VOCs** can get into your body through inhalation when the water is used, such as during showering and washing dishes.

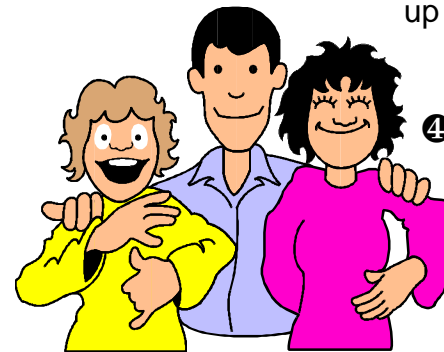
³ **Radon** gas can get into your body through inhalation when the water is used, such as during showering and washing dishes

In general, the following factors determine whether harmful health effects will result from exposure to contaminants in your well water:

❶ **the toxicity of the contaminant found in your well water:** Some contaminants are more likely to cause health effects than others.

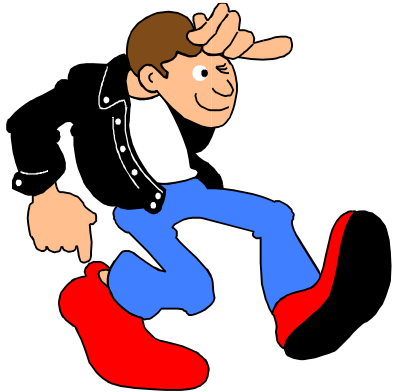
❷ **the amount of the contaminant found in your well water:** Health effects are more likely to occur as the level of the contaminant increases. Many contaminants, however, are unlikely to cause health effects below certain levels.

❸ **how long and how often you are exposed to the contaminant:** The type and severity of health effects that occur depend on how frequently you have been exposed and how much of the contaminant has built up in your body over time.



❹ **individual characteristics:** Your age, sex, family traits, and health status can affect how likely you are to experience health effects from the contaminant.

WHAT FACTORS DETERMINE THE LIKELIHOOD THAT YOUR WELL WATER WILL BECOME CONTAMINATED?



It is important for you to determine the likelihood that your own well will become contaminated based on your specific circumstances. Numerous factors influence your well's susceptibility to contamination.

① Type and age of your well:

Hand dug wells tend to be inadequately enclosed and unprotected from nearby contamination.

② Depth of your well:

Shallow wells that receive water from very close to the ground's surface are easily impacted by surface contamination.

③ Location of your well:

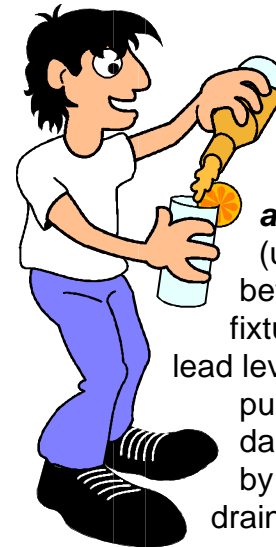
A well that is located close to the household septic system or other nearby septic systems, particularly those uphill, may be contaminated by common household wastes. New Jersey regulations require that new wells be located at least 100 feet from any possible source of contamination.

④ Construction and maintenance of your well:

Improper well design and construction can place your well at risk of contamination. Likewise, inadequate well repair and maintenance (such as failing to chlorinate the well after repair work is done) can lead to contamination. State and local standards for the drilling, construction, location, and maintenance of wells can be used to ensure the proper installation of a new well and to evaluate the integrity of an existing well.

⑤ Characteristics of your local geology, ground water, and climate:

Soil type, underlying rock formations, water chemistry and weather conditions influence the likelihood that contamination will reach your well. For example, acidic water tends to dissolve metals, such as lead and copper, from household plumbing materials into the water. Contact your local health department or local cooperative extension agent for more information about environmental conditions in your area.



⑥ Characteristics of your household plumbing materials and well components:

Lead pipes (used before 1940), lead solder (used before 1987) and brass plumbing fixtures can contribute significantly to lead levels in your well water. Some well pumps also contain lead. Corrosion damage to copper plumbing, indicated by a blue-green stain around the sink drain, may be a sign of acidic water.

7 Natural sources of ground water contamination:

Substances, such as radium, may be found naturally in the ground water that supplies your well. In addition, radium can be released into your indoor air as radon gas when you use your well water. Contact your local health department or the New Jersey Department of Environmental Protection for more information on radium and radon in ground water.



8 Household practices: Many possible sources of contamination to your well may come from your household activities. The improper use and storage of household chemicals can result in the contamination of your own well. Likewise, improper disposal of chemicals, such as into the septic system, can place your well at risk of contamination. Common household sources of contamination include:



- paints
- pesticides
- lawn and garden fertilizers
- well water treatment chemicals, such as disinfectants and corrosion inhibitors

9 Local land use activities:

Possible sources of contamination to your well may depend upon where you live and what you are living near. Common sources of well contamination include:



- livestock management areas
- farms and fruit orchards
- hazardous waste sites and municipal landfills
- underground gasoline storage tanks
- heavy industry, such as machine shops and chemical plants
- local businesses, such as gas stations and dry cleaners
- municipal public works facilities, such as road maintenance (deicing salt storage and applications)

10 Known or suspected private well

contamination: Well contamination problems in your neighborhood may also be impacting your well. Previous contamination of your well may increase the likelihood that your well will become contaminated in the future. Contact your local health department for more information about contamination problems in your area.



WHAT CONTAMINANTS SHOULD YOU TEST FOR?

It is impractical and unnecessary to test for all possible contaminants. While it is a good idea to test regularly for certain contaminants, such as microorganisms, testing frequency for other contaminants should depend upon how susceptible your well is to contamination (see page 11 for more information). Your local health department or your cooperative extension office can give you advice on specific tests to have done based on any known water quality problems in your area. Local commercial labs may also be familiar with problems specific to your area and may

be able to provide advice about what contaminants to test for. Your local health department can also tell you if there are any specific well testing requirements for your area.

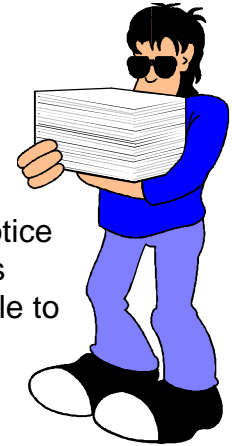


Specific lab tests should be selected based on what is appropriate for your situation.

While some lab tests look for only one type of contaminant, other tests look for a class of contaminants. In most situations, several different tests will be necessary to address all the contaminants that are of concern to you.

Water samples should be collected from the faucet used for drinking and cooking purposes. If possible, test your water under the worst conditions, such as after a heavy rain when contamination is most likely to occur, and during different seasons each year.

Keep a record of all your water test results as a guide for future testing. Even slight changes in contaminant levels may be good indicators of new water problems you may not notice yourself. By observing any changes that occur over time, you may be able to correct problems before they negatively affect your water supply and health.



The following information can be used as general guidance to help you decide what contaminants you may need to test for and how often you should test. Keep in mind that you may need to test more often than indicated based on your individual circumstances.

CONTAMINANT	TYPE OF TEST	FREQUENCY
- Minimum Testing Recommendations -		
Microorganisms	total coliform bacteria ¹	at least once a year
Nitrates	total nitrate/nitrite (as nitrogen)	once a year
Lead	first draw lead ²	at least once
- Additional Testing Recommendations -		
Mercury	total mercury	once a year
VOCs	volatile organic scan	once a year
Pesticides	pesticide scan	once every 3 years
Radionuclides	gross alpha ³	at least once
Secondary Contaminants ⁴ : pH ⁵ Total Dissolved Solids ⁶ Other ⁷		once a year once a year once every 3 years

¹ A **total coliform bacteria** test measures the total number of living coliform bacteria in the water. Although most types of coliform bacteria are not harmful, their presence in drinking water may mean that disease-causing bacteria are present.

² A **first draw** lead sample is collected from the tap after the water has not been run for several hours or more, such as overnight.

³ A **gross alpha** test measures the amount of alpha radiation from all radionuclides that may be present in the water. If a high level of radioactivity is found, additional tests are needed to identify which radionuclides are present.

⁴ **Secondary contaminants** are those that negatively affect the odor, color, taste or appearance of the water.

⁵ **pH** measures how acidic or basic the water is.

⁶ **Total dissolved solids** measures the level of dissolved materials in water.

⁷ **Other** secondary contaminants include chloride, corrosivity, hardness, iron, manganese, and sodium.

WHERE SHOULD YOU HAVE YOUR WELL WATER TESTED?

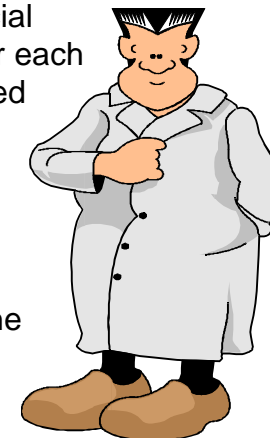


Commercial testing labs are listed in the yellow pages of the telephone book. Make sure that the lab is certified to test for the specific contaminants of concern to you. A list of New Jersey certified labs in your area can be obtained from your local health department, cooperative extension office, or the New Jersey Department of Environmental Protection.

HOW MUCH DOES IT COST TO TEST YOUR WELL WATER?

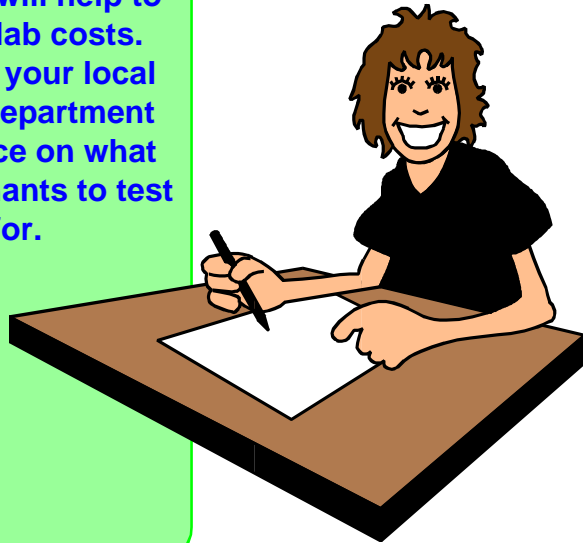
Contact several certified commercial labs to ask about specific costs for each of the water tests you are interested in. Also, check with your local health department to find out if they provide low cost testing services.

Prices will vary depending upon the type of sampling and testing procedures involved.



Since testing can be expensive; it is best to run tests that are broad in scope and provide the most information. Evaluate your well's vulnerability to specific types of contamination. Testing for only those contaminants that are likely to be present will help to reduce lab costs. Contact your local health department for advice on what contaminants to test for.

For example, in some cases, a trained lab technician will collect the sample; in other cases, the lab will provide you with sampling equipment and instructions. (Be sure to follow the instructions carefully for proper sample collection, preservation and handling.) Although sample collection by the lab will tend to be more expensive, it may be necessary in order to obtain reliable test results.



WHAT DO YOUR TEST RESULTS MEAN?



The commercial testing lab should provide you with a complete report of your well water test results. The report should list all the contaminants that were tested for and the concentrations that were found, if any. Some contaminant levels are reported in parts per million (ppm), or milligrams per liter (mg/l); others are reported in parts per billion (ppb), or micrograms per liter (ug/l).

If contaminants are found, it does not necessarily mean your water is unacceptable to drink. In order to protect the public from harmful health effects of contaminants in drinking water, both federal and State public drinking water standards and action levels were established to limit the amount of certain contaminants in public drinking water supplies:

- **Maximum Contaminant Levels (MCLs)** are set at levels that provide a wide margin of protection from harmful health effects for most people over a lifetime. Public water companies are legally required to meet MCLs.
- **Action levels (ALs)** are trigger points at which corrective action should be undertaken by the public water company. ALs are enforceable by law.

Public drinking water standards can be used as guidelines to determine whether you need to take steps to lower contaminant levels in your private well water. For example, your well water test results can be compared with those listed in the table below:

Contaminant	Water Standard
Microorganisms (total coliform)	Absence of coliform bacteria ¹
Nitrates	10,000 ppb ¹
Lead	15 ppb ²

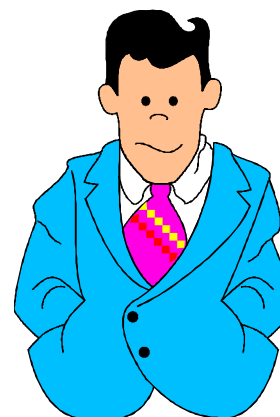
¹ New Jersey Maximum Contaminant Level
² If more than 10% of household drinking water samples exceed the action level for lead, corrective actions must be taken by the public water company.



If contaminants are found in your well water at levels below the standards, it is unlikely that you or your family will experience any harmful health effects from the presence of these contaminants in your drinking water. If your test results are above the standards, you should consider taking steps to reduce contaminant levels in your well water.

Contact your local health department, cooperative extension office, or NJDEP for a complete list of State and Federal public drinking water standards.

WHAT SHOULD YOU DO IF CONTAMINANTS ARE FOUND IN YOUR WELL WATER?



Federal and State public drinking water standards and action levels can be used to help you identify any problems with your well and to decide whether you need to take any corrective actions.

If contaminants are found in your well water at levels above the standards, you should:

- **Retest your well water to make sure that the first sample was collected and analyzed properly.**
- **If contaminants are found in the second sample, take steps to reduce contaminant levels in your well water.**

Contact your lab, local health department, cooperative extension office, or NJDHSS, for help in understanding your test results, and for advice on steps you can take to reduce contaminants in your well water.

WHAT CAN YOU DO TO REDUCE THE LEVEL OF CONTAMINANTS IN YOUR WELL WATER?

Corrective actions should be selected based on the contaminants of concern and the source of contamination. Some actions are intended for short-term use while others are considered to be permanent solutions.

You can reduce the level of contaminants in your well water by taking one or more of the following corrective actions:

- **Install a home water treatment device**
- **Install a new and/or deeper well**
- **Repair and/or maintain your septic system**
- **Connect to a nearby public water supply**

In many instances, there are temporary steps that you can take to lower your exposure to specific contaminants in well water until permanent solutions are found. For example, **boiling your water for at least one minute** and **disinfecting your well** are effective ways of reducing your exposure to microorganisms. Also, lead levels can be lowered by **replacing or repairing your household pipes**. Of course, **purchasing bottled water** is a quick and easy way of reducing your exposure to contaminants in well water.



WHAT CAN YOU DO TO PROTECT YOUR WELL WATER FROM CONTAMINATION?

Ensure the proper design, construction and location of your well. Be sure that your well is installed by a licensed well driller. Contact your local health department for more information about well construction and location requirements.

Establish and implement a regular maintenance schedule for your well. Follow your manufacturer's well maintenance instructions. Keep accurate up-to-date records of well installation, repairs, pumping tests, and water tests.

Ensure proper septic system design, location, and maintenance. Do not dispose of hazardous household chemicals in your septic system. Be sure to perform routine maintenance of your septic system. Contact your local health department about septic system requirements.

Protect the area around your well. Conduct a household inventory of the hazardous chemicals found in and around your home. Ensure the proper use, storage and disposal of household chemicals. Follow instructions carefully for the application of garden fertilizers and pesticides. Protect the area around your well from livestock, pet and wildlife wastes.

Identify possible sources of contamination to your well. Be aware of water contamination problems in your neighborhood. Contact your local health department or cooperative extension office about contamination your area.

Disinfect your well before using it for the first time and after any repair work.

Maintain home water treatment devices according to the manufacturer's instructions.

FOR MORE INFORMATION...

◆ **Local Health Department**

Local telephone directory

Local water issues and land-use activities, private well testing guidance, well construction requirements, and health effects of contaminants in well water

◆ **New Jersey Department of Health and Senior Services
Consumer and Environmental Health Services**

PO Box 369

Trenton, NJ 08625-0369

(609) 588-3120

Health effects of chemically contaminated drinking water

(609) 588-7500

Health effects of microorganisms in drinking water

(609) 588-3123

Bottled water regulations



◆ **New Jersey Department of Environmental Protection
Bureau of Safe Drinking Water**

(609) 292-5550

Federal and State drinking water regulations and public water supply monitoring results

Bureau of Water Allocation

(609) 984-6831

Well permitting and regulations

FOR MORE INFORMATION...

Office of Quality Assurance

(609) 292-3950

NJ certified laboratories for well testing

Bureau of Site Remediation

(609) 984-5862

Home water treatment devices

Radon Information Line

(800) 648-0394



◆ **United States Environmental Protection Agency
Safe Drinking Water Hotline**

(800) 426-4791

Federal drinking water regulations, health effects of drinking water contamination, and water safety issues

◆ **County Office of Rutgers Cooperative Extension**

Local telephone directory

Local land use activities and private well testing guidance

◆ **NSF International**

(313) 769-8010

(800) NSF-6275

Home water treatment device and bottled water information

OTHER AVAILABLE MATERIALS...

- FACTS: Lead in Drinking Water*
- FACTS: Mercury in Drinking Water*
- FACTS: Microorganisms in Drinking Water*
- FACTS: Nitrate and Nitrite in Drinking Water*
- FACTS: Pesticides in Drinking Water*
- FACTS: Volatile Organic Compounds in Drinking Water*
- Parasites and New Jersey Drinking Water: Information on Giardia and Cryptosporidium*
- Contacts and Information: Drinking Water Issues*
- Don't Drink Lead (11" x 17" poster)*
- Don't Drink Lead (8½" x 11" flyer)*
- Keep Your Baby Safe From Lead (11" x 17" poster)*
- Keep Your Baby Safe From Lead (8½" x 11" flyer)*



Name _____

Address _____

Town _____ State _____ Zip _____

Please send this order form to:

New Jersey Department of Health and Senior Services
Consumer and Environmental Health Services
PO Box 369
Trenton, NJ 08625-0369



Division of Environmental and Occupational Health Services
Consumer and Environmental Health Services
PO Box 369
Trenton, NJ 08625-0369