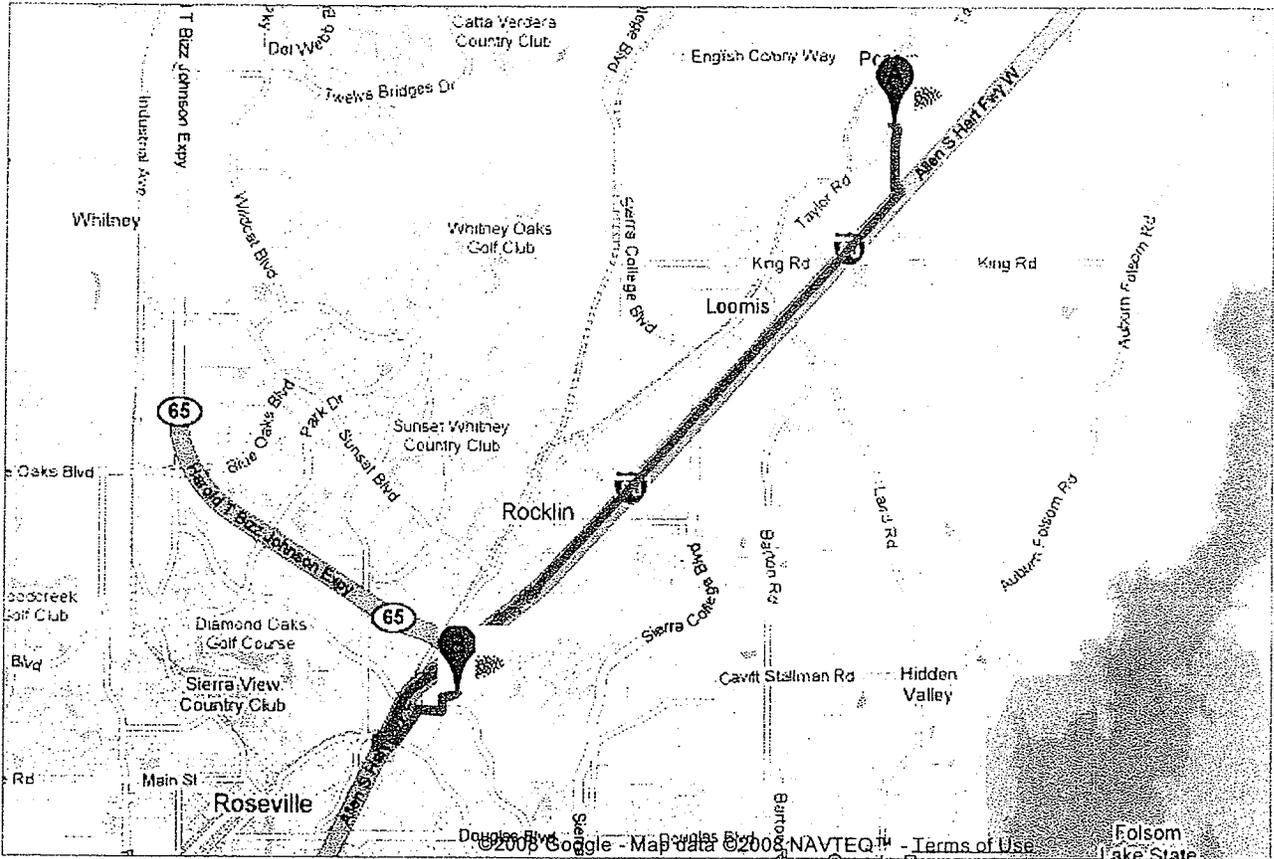


**FIGURE D-1**  
**Hospital Route Map**





Start **Taylor Rd & Penryn Rd**  
**Penryn, CA 95663**  
End **1 Medical Plaza Dr**  
**Roseville, CA 95661**  
Travel **9.5 mi – about 13 mins**



 **Taylor Rd & Penryn Rd**  
**Penryn, CA 95663**

Drive: 9.5 mi – about 13 mins

1. Head **southeast** on **Penryn Rd** toward **Penryn Estates Dr** 0.6 mi  
1 min
- ← 2. Turn **left** to merge onto **I-80 W** toward **Sacramento** 7.5 mi  
8 mins
3. Take exit **105A** to merge onto **Eureka Rd** toward **Taylor Rd** 0.5 mi  
1 min
- ← 4. Turn **left** at **Taylor Rd** 0.4 mi  
1 min
- 5. Turn **right** at **E Roseville Pkwy** 0.2 mi  
1 min
- ← 6. Turn **left** at **Medical Plaza Dr** 0.1 mi  
1 min
- 7. Turn **right** to stay on **Medical Plaza Dr** 0.2 mi
- ← 8. Turn **left** to stay on **Medical Plaza Dr** 207 ft

 **1 Medical Plaza Dr**  
**Roseville, CA 95661**

These directions are for planning purposes only. You may find that construction projects, traffic, or other events may cause road conditions to differ from the map results.

Map data ©2008 NAVTEQ™

**APPENDIX D-A**  
**CHEMICAL HAZARD INFORMATION**



## CHEMICAL HAZARD INFORMATION

The following information is excerpted from the Agency for Toxic Substances and Disease Registry (ATSDR) Toxicological Profile Information Sheets, (ATSDR, 2003). For more information, call the ATSDR Information Center at 1-888-422-8737, or check the ATSDR website at <http://www.atsdr.cdc.gov/toxpro2.html>.

### A-1 Arsenic

Exposure to higher than average levels of arsenic occurs mostly in the workplace, near hazardous waste sites, or in areas with high natural levels. At high levels, inorganic arsenic can cause death. Exposure to lower levels for a long time can cause a discoloration of the skin and the appearance of small corns or warts.

Arsenic is a naturally occurring element widely distributed in the earth's crust. In the environment, arsenic is combined with oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Arsenic in animals and plants combines with carbon and hydrogen to form organic arsenic compounds.

Arsenic cannot be destroyed in the environment. It can only change its form. Arsenic in air settles to the ground or washes out of the air during rain. Many arsenic compounds can dissolve in water. Fish and shellfish can accumulate arsenic, but the arsenic in fish is mostly in a form that is not harmful.

Exposure to arsenic may occur by eating food, drinking water, or breathing air containing arsenic, breathing contaminated workplace air, breathing sawdust or burning smoke from wood treated with arsenic, living near uncontrolled hazardous waste sites containing arsenic, living in areas with unusually high natural levels of arsenic in rock.

Breathing high levels of inorganic arsenic can give you a sore throat or irritated lungs. Ingesting high levels of inorganic arsenic can result in death. Lower levels of arsenic can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of "pins and needles" in hands and feet. Ingesting or breathing low levels of inorganic arsenic for a long time can cause a darkening of the skin and the appearance of small "corns" or "warts" on the palms, soles, and torso. Skin contact with inorganic arsenic may cause redness and swelling. Several studies have shown that inorganic arsenic can increase the risk of lung cancer, skin cancer, bladder cancer, liver cancer, kidney cancer, and prostate



cancer. The World Health Organization (WHO), the Department of Health and Human Services (DHHS), and the EPA have determined that inorganic arsenic is a human carcinogen.

The OSHA 8-hour TWA PEL for arsenic is  $0.050 \text{ mg/m}^3$ . The NIOSH 15-minute REL is  $0.002 \text{ mg/m}^3$ .

## **A-2 Lead**

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. It has no special taste or smell. Lead can be found in all parts of our environment. Most of it comes from human activities like mining, manufacturing, and the burning of fossil fuels. Lead has many different uses, most importantly in the production of batteries. Lead is also in ammunition, metal products (solder and pipes), roofing, and devices to shield x-rays. Because of health concerns, lead from gasoline, paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years.

When lead enters the environment it does not break down, but sunlight, air, and water change lead compounds. When released to the air from industry or burning of fossil fuels or waste, it stays in air about 10 days. Most of the lead in material comes from particles falling out of the air. City soils also contain lead from landfills and leaded paint. Lead sticks to soil particles. It does not move from soil to underground water or drinking water unless the water is acidic or "soft." It stays a long time in both soil and water.

Lead can affect almost every organ and system in your body. The most sensitive is the central nervous system, particularly in children. Lead also damages kidneys and the immune system. The effects are the same whether it is breathed or swallowed. Exposure to lead is more dangerous for young and unborn children. Unborn children can be exposed to lead through their mothers. Harmful effects include premature births, smaller babies, decreased mental ability in the infant, learning difficulties, and reduced growth in young children. These effects are more common after exposure to high levels of lead. In adults, lead may decrease reaction time, cause weakness in fingers, wrists, or ankles, and possibly affect the memory. Lead may cause anemia, a disorder of the blood. It can cause abortion and damage the male reproductive system. The connection between these effects and exposure to low levels of lead is uncertain.

The OSHA PEL for lead is  $0.050 \text{ mg/m}^3$ . NIOSH states that air concentrations should be maintained so that worker blood lead remains less than  $0.060 \text{ mg Pb/100 g}$  of whole blood.



### A-3 Organic Pesticide Compounds

DDT (1,1,1-trichloro-2,2-bis(*p*-chlorophenyl)ethane) is a pesticide that was once widely used to control insects on agricultural crops and insects that carry diseases like malaria and typhus, but is now used in only a few countries to control malaria. Technical-grade DDT is a mixture of three forms, *p,p'*-DDT (85%), *o,p'*-DDT (15%), and *o,o'*-DDT (trace amounts). All of these are white, crystalline, tasteless, and almost odorless solids. Technical grade DDT may also contain DDE (1,1-dichloro-2,2-bis(*p*-chlorophenyl)ethylene) and DDD (1,1-dichloro-2,2-bis(*p*chlorophenyl)ethane) as contaminants. DDD was also used to kill pests, but to a far lesser extent than DDT. One form of DDD (*o,p'*-DDD) has been used medically to treat cancer of the adrenal gland. Both DDE and DDD are breakdown products of DDT.

DDT does not occur naturally in the environment. After 1972, the use of DDT was no longer permitted in the United States except in cases of a public health emergency. It is, however, still used in some other areas of the world, most notably for controlling malaria. The use of DDD to kill pests has also been banned in the United States.

Before 1973 when it was banned, DDT entered the air, water, and soil during its production and use as an insecticide. DDT is present at many waste sites, including NPL sites; releases from these sites might continue to contaminate the environment. Most DDT in the environment is a result of past use; DDD was also used as a pesticide to a limited extent in the past. DDT still enters the environment because of its current use in other areas of the world. DDE is only found in the environment as a result of contamination or breakdown of DDT. DDD also enters the environment during the breakdown of DDT.

Large amounts of DDT were released into the air and on soil or water when it was sprayed on crops and forests to control insects. DDT was also sprayed in the environment to control mosquitoes. Although the use of DDT is no longer permitted in the United States, DDT may be released into the atmosphere in other countries where it is still manufactured and used, including Mexico. DDT, DDE and DDD may also enter the air when they evaporate from contaminated water and soil. DDT, DDE, and DDD in the air will then be deposited on land or surface water. This cycle of evaporation and deposition may be repeated many times. As a result, DDT, DDE, and DDD can be carried long distances in the atmosphere. These chemicals have been found in bogs, snow, and animals in the Arctic and Antarctic regions, far from where they were ever used. Some DDT may have entered the soil from waste sites. DDT, DDE, and DDD may occur in the atmosphere as a vapor or be attached to solids in air. Vapor phase DDT, DDE, and DDD may break down in the atmosphere due to reactions caused by the sun. The half-life of these



chemicals in the atmosphere as vapors (the time it takes for one-half of the chemical to turn into something else) has been calculated to be approximately 1.5-3 days. However, in reality, this half-life estimate is too short to account for the ability of DDT, DDE, and DDD to be carried long distances in the atmosphere.

DDT, DDE, and DDD last in the soil for a very long time, potentially for hundreds of years. Most DDT breaks down slowly into DDE and DDD, generally by the action of microorganisms. These chemicals may also evaporate into the air and be deposited in other places. They stick strongly to soil, and therefore generally remain in the surface layers of soil. Some soil particles with attached DDT, DDE, or DDD may get into rivers and lakes in runoff. Only a very small amount, if any, will seep into the ground and get into groundwater. The length of time that DDT will last in soil depends on many factors including temperature, type of soil, and whether the soil is wet. DDT lasts for a much shorter time in the tropics where the chemical evaporates faster and where microorganisms degrade it faster. DDT disappears faster when the soil is flooded or wet than when it is dry. DDT disappears faster when it initially enters the soil. Later on, evaporation slows down and some DDT moves into spaces in the soil that are so small that microorganisms cannot reach the DDT to break it down efficiently. In tropical areas, DDT may disappear in much less than a year. In temperate areas, half of the DDT initially present usually disappears in about 5 years. However, in some cases, half of the DDT initially present will remain for 20, 30, or more years.

In surface water, DDT will bind to particles in the water, settle, and be deposited in the sediment. DDT is taken up by small organisms and fish in the water. It accumulates to high levels in fish and marine mammals (such as seals and whales), reaching levels many thousands of times higher than in water. In these animals, the highest levels of DDT are found in their adipose tissue. DDT in soil can also be absorbed by some plants and by the animals or people who eat those crops. People in the United States are exposed to DDT, DDE, and DDD mainly by eating foods containing small amounts of these compounds. Although not common today, exposure to DDT could also occur through inhalation or absorption through the skin during the handling or application of DDT. Even though DDT has not been used in this country since 1972, soil may still contain some DDT that may be taken up by plants and eaten by animals and people. DDT from contaminated water and sediment may be taken up by fish. The amount of DDT in food has greatly decreased since DDT was banned and should continue to decline. In the years 1986 to 1991, the average adult in the United States consumed an average of 0.8 micrograms (a microgram is a millionth of a gram) of DDT a day. Adults consumed slightly different amounts based on their age and sex. The largest fraction of DDT in a person's diet comes from meat, poultry, dairy products, and fish, including the consumption of sport fish. Leafy vegetables



generally contain more DDT than other vegetables, possibly because DDT in the air is deposited on the leaves. Infants may be exposed by drinking breast milk.

DDT or its breakdown products are still present in some air, water, and soil samples. However, levels in most air and water samples are presently so low that exposure is of little concern. DDT levels in air have declined to such low levels that it often cannot be detected. In cases where DDT has been detected in air, it is associated with air masses coming from regions where DDT is still used or from the evaporated DDT from contaminated water or soil. *p,p'*-DDT and *p,p'*-DDE concentrations measured in air in the Great Lakes region in 1990 reached maximum levels of 0.035 and 0.119 nanograms (a nanogram is a billionth of a gram) of chemical per cubic meter of air ( $\text{ng}/\text{m}^3$ ), respectively. Levels were generally much lower, especially during the winter months. In 1995-1996, soils in the corn belt, where DDT was heavily used in the past, contained on the average about 10 nanograms of DDT in a gram of soil. In recent years, most surface water has not contained detectable amounts of DDT.

People who work or live around NPL sites or work with contaminated soil or sediment would most likely be exposed by accidentally swallowing soil, having skin contact with the soil, inhaling DDT vapor, or breathing in DDT in dust.

Today in the United States, DDT, DDE, or DDD enters the body mainly when a person eats contaminated food. The actual amounts of DDT, DDE, and DDD absorbed from foods depends on both the concentration of chemical in the food and the amount of food eaten. Small amounts of DDT, DDE, and DDD may also be breathed in and absorbed into the body. DDT, DDE, and DDD are often attached to particles too large to pass very far into the lungs after air containing them is breathed. These particles are more likely to be carried upward in the mucus of the air passages and swallowed than for the DDT to be absorbed in the lungs. DDT, DDE, and DDD do not enter the body through the skin very easily.

Once inside the body, DDT can break down to DDE or DDD. DDE and DDD, in turn, break down to other substances (called metabolites). DDT, DDE, and DDD are stored most readily in fatty tissue, especially DDE. Some of these stored amounts leave the body very slowly. Levels in fatty tissues may either remain relatively the same over time or even increase with continued exposure. However, as exposure decreases, the amount of DDT in the body also decreases. DDT metabolites leave the body mostly in urine, but may also leave by breast milk and pass directly to nursing infants.



Eating food with large amounts (grams) of DDT over a short time would most likely affect the nervous system. People who swallowed large amounts of DDT became excitable and had tremors and seizures. They also experienced sweating, headache, nausea, vomiting, and dizziness. These effects on the nervous system went away once exposure stopped. The same type of effects would be expected by breathing DDT particles in the air or by contact of the skin with high amounts of DDT. Tests in laboratory animals confirm the effect of DDT on the nervous system.

No effects have been reported in adults given small daily doses of DDT by capsule for 18 months (up to 35 milligrams [mg] every day). People exposed for a long time to small amounts of DDT (less than 20 mg per day), such as people who worked in factories where DDT was made, had some minor changes in the levels of liver enzymes in the blood. A study in humans showed that increasing concentrations of *p,p'*-DDE in human breast milk were associated with reductions in the duration of lactation. An additional study in humans found that as the DDE levels in the blood of pregnant women increased, the chances of having a pre-term baby also increased. It should be mentioned, however, that the levels of DDE in the blood at which this was noticed were higher than those currently found in women from the general population in the United States, but not higher than those that may be found in women in countries where DDT is still being used.

Animal studies show that long-term exposure to moderate amounts of DDT (20-50 mg per kilogram [kg] of body weight every day) may affect the liver. Tests in animals also suggest that short-term exposure to DDT and metabolites in food may have a harmful effect on reproduction. In addition, we know that some breakdown products of DDT can cause harmful effects on the adrenal gland. This gland is situated near the kidney and produces hormones (substances produced by organs and released to the bloodstream to regulate the function of other organs). Studies in animals have shown that oral exposure to DDT can cause liver cancer. Studies of DDT-exposed workers did not show increases in deaths or cancers. Based on all of the evidence available, the Department of Health and Human Services has determined that DDT is reasonably anticipated to be a human carcinogen. Similarly, the International Agency for Research on

Cancer (IARC) has determined that DDT is possibly carcinogenic to humans. EPA has determined that DDT, DDE, and DDD are probable human carcinogens.

The OSHA 8-hour TWA PEL for DDT, DDE and DDD is 1.0 mg/m<sup>3</sup>. The NIOSH 15-minute REL is 0.5 mg/m<sup>3</sup>.



Endrin is a solid, white, almost odorless substance that does not occur naturally in the environment. It was used as a pesticide to control insects, rodents, and birds. Most likely exposure pathways include ingestion, absorption and inhalation. Exposure to endrin can cause various harmful effects including death and severe central nervous system (brain and spinal cord) injury. No long-term health effects have been noted in workers who have been exposed to endrin by breathing or touching it. The EPA has determined that endrin is not classifiable as to its human carcinogenicity because there is not enough information to allow classification. Endrin was banned for public health reasons, and has not been produced or sold for general use in the United States since 1986.

Methoxychlor is a manufactured chemical that does not occur naturally in the environment. Pure methoxychlor is a pale-yellow powder with a slight fruity or musty odor. Methoxychlor is used as an insecticide against flies, mosquitoes, cockroaches, chiggers, and a wide variety of other insects. It is used on agricultural crops and livestock, and in animal feed, barns, grain storage bins, home garden, and on pets. Methoxychlor is also known as DMDT, Marlate®, or Metox®. Most likely exposure pathways include ingestion, absorption and inhalation.

There is very little information on how methoxychlor can affect people's health. Animals exposed to very high amounts of methoxychlor suffered tremors and convulsions and seizures. Because methoxychlor is broken down quickly in the body, you are not likely to experience these effects unless you are exposed to very high levels.

Animal studies show that exposure to methoxychlor in food or water harms the ovaries, uterus, and mating cycle in females, and the testes and prostate in males. Fertility is decreased in both male and female animals. These effects can occur both in adult and in developing animals and could also occur following inhalation or skin contact. These effects are caused by a breakdown product of methoxychlor which acts as a natural sex hormone. These effects have not been reported in humans, but they could happen.

Most of the information available from human and animal studies suggests that methoxychlor does not cause cancer. The International Agency for Research on Cancer (IARC) and the EPA have determined that methoxychlor is not classifiable as to its carcinogenicity to humans.



**APPENDIX D-B**  
**HEAT STRESS INFORMATION**



## SIGNS AND SYMPTOMS OF HEAT STRESS

Type	Cause	Signs and Symptoms
Heat rash	May result from continuous exposure to heat or humid air	<ul style="list-style-type: none"><li>○ Rash or itching feeling on skin</li></ul>
Heat cramps	Are caused by heavy sweating with inadequate electrolyte replacement	<ul style="list-style-type: none"><li>○ Muscle spasms</li><li>○ Pain in the hands, feet, and abdomen</li></ul>
Heat exhaustion	occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration	<ul style="list-style-type: none"><li>○ Pale, cool, moist skin</li><li>○ Heavy sweating</li><li>○ Dizziness</li><li>○ Nausea</li><li>○ Fainting</li></ul>
Heat stroke	the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occur. Competent medical help must be obtained.	<ul style="list-style-type: none"><li>○ Red, hot, usually dry skin</li><li>○ Lack of or reduced perspiration</li><li>○ Nausea, dizziness and confusion</li></ul>



**APPENDIX D-C**  
**RESUMES OF KEY PERSONNEL**

