FANHD Residential Property Disclosure Reports

The Environmental Screening Report

Supplement

Guide to Residential Property Environmental Hazards

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BACKGROUND INFORMATION

The subject of hazardous waste can be an emotional and uncertain topic. You have taken an important step by obtaining this report to help become informed on environmental issues. There are a number of important factors to consider when assessing environmental issues. Risk is only one factor. Others include public values and perceptions, economic constraints, perceived risk to health etc. Accurate and unbiased information is important. It provides a logical foundation for decisions that are often emotionally based on “perceived” rather than on actual risk.

This section includes discussions on certain topics to help you understand this report. The subject of contamination is broad and complex. These discussions are not intended to be an exhaustive study of environmental issues. In addition, many aspects of hazardous substance clean up and control change as state-of-the-art practice and legislation changes. For these reasons, the following information is of necessity generalized and may not apply to every site. This section is divided into the following:

- What Are Hazardous Substances? Understanding the Risk in Perspective
- Groundwater
- Formation of Plumes: The Transport of Chemicals into Groundwater
- Leaking Underground Fuel Tanks
- What is a “Superfund” Site?
- Drinking Water: Tap vs. Private Well

WHAT ARE HAZARDOUS SUBSTANCES?

Chemicals in our environment are a controversial subject. This is because their effects on human health are often not well understood. Both the government and the public want clear standards that define when a substance is considered “hazardous.” Unfortunately, it is not always easy to determine such a clear standard. Precise instruments allow us to detect a wide variety of substances even in very small concentrations. Sometimes these substances are only detectable in the parts per billion (ppb) or parts per trillion (ppt) ranges. In these cases, the concentrations are at or near the limit of our ability to even detect them.

If scientific study shows that a particular chemical is known or suspected to adversely affect our health, that substance could become listed as an official hazardous substance. The list of what “is” and “is not” a hazardous substance changes. With increased research, substances are added and, in some cases, removed.

The potential health implications make us question the presence of chemicals in our environment. It’s important to understand that any risk associated with a substance is dependent on both the concentration of the chemical *and* the length of exposure time. Some scientists believe that a “threshold” level exists for many chemical concentrations below which there are no known or anticipated adverse health effects. This allows standard concentration limits of some chemicals to be established. These standards are called “Maximum Contaminant Levels” (MCL), and they are enforceable by the Environmental Protection Agency. If these levels are exceeded, the substance must be cleaned-up until it is at or below the MCL.

The term “hazardous substance” is used in this report as synonymous with “hazardous waste” and “toxic substance.” In general, the terms refer to a material with potentially harmful affects. Once a particular substance is determined to be harmful, it may become regulated by one or more environmental laws. When this happens, it is termed “listed.” Once a chemical is “listed,” Sites that have spilled or leaked the substance may be required to clean it up.

Hazardous Substances in Perspective
As is true with *any* hazardous substance, the mere presence of it is not a threat to human health. In order to pose a health risk, that substance must come into physical contact with the body by eating, drinking, inhalation, or skin contact. It is the likelihood of physical exposure to a substance that must be carefully examined to determine an acceptable level of risk. Information on how contaminated Sites can or *cannot* affect the property is vital in making decisions. Inaccurate perceptions could lead to making misinformed decisions. Two lines of logic to consider when analyzing risk are:

• We make daily decisions based on familiar and acceptable levels of risk because we feel the benefits outweigh the potential consequences. For instance, although we know driving freeways might be dangerous, we drive them anyway because convenience and speed makes this risk acceptable. Many risks we undertake everyday aren’t considered hazardous simply because they are familiar.

• Everyday, we make decisions based on what is most important to accomplish first, second, etc. This is necessary because if all problems were assigned equal importance, nothing could be accomplished. Risk is commonly considered similarly or, in other words, as “relative risk.” This consideration is based on deciding what “risk” has the worst or immediate adverse consequence and then address that risk first.

Often, decisions are not based on scientific analysis and hard data, but on perceived risk and public opinion. In the environmental arena, these two approaches go head to head. Public attention may be focused on certain environmental hazards based on a dramatic and well-publicized environmental problem. Unfortunately, this may lead to a diminished concern for other environmental issues that may pose more immediate concern. This line of thinking is not directed at undermining the significance of large-scale contamination, but is meant to direct attention to the “big picture.”

Many studies indicate that things we do on a daily basis in our homes may expose us to a greater overall health risk than living next door to virtually any contaminated site. It’s hard to imagine that many of the items we take for granted in our homes have higher concentrations of hazardous substances and expose us for greater amounts of time than just about anything we encounter in normal outdoor activities. This is where familiarity with items such as “dry-cleaned” clothes, many air fresheners, mothballs, paints or shoe polishes make the hazardous substances in such things acceptable. In certain cases, chemicals that are strictly regulated in industry are not regulated in homes. An example is methylene chloride, which the EPA found in about one-third of 1000 common household products in a 1987 study. Methylene chloride is regulated in factory emissions, but not within homes.

Understanding a variety of issues is important for making informed decisions. Evaluating risks accurately in order to avoid over- or under-reacting is a task best completed based on sound, accurate information.

GROUNDWATER

The water in lakes, rivers, and groundwater all together only account for about 0.6% of the total water on Earth. Of these, groundwater is the most important fresh water supply. About half of the United States depends on groundwater for their drinking water. An expanding population and economy has prompted a dramatic increase in the demand for water from groundwater supplies. Many thought such water was immune from contamination. However, as more incidents of groundwater pollution occur, public interest in protecting our groundwater has increased as well as legislative protection of this resource.

Although the technical aspects of groundwater and groundwater pollution are beyond the scope of this report, the basic concepts are easy to understand and can help in evaluating other information in this report.

How Groundwater Reservoirs Form
In order to understand the basic principles of groundwater, it is necessary to appreciate the “hydrologic cycle.” This is the system by which nature circulates water. In short, water evaporates from the ocean and rises to form clouds.

Water in the air condenses and eventually falls back to the earth in the form of rain, snow, sleet, hail etc. which then eventually flows back to the ocean.

We depend on precipitation that falls on land to replenish our fresh water supply. Precipitation can fall directly into water bodies, from run-off, or soak into the soil. Much is absorbed by plants or evaporates, but a portion seeps down into the groundwater. Technically, "groundwater" is water located in water-saturated zones below the surface. Water located in unsaturated zones is simply called "soil water."

Groundwater is primarily stored in "aquifers." Usually, aquifers consist of gravel, sand, clay or fractured rock. Groundwater is stored in the pores and cavities of sediments or in rock fractures. It does not occur as an underground "ocean" or "river" except perhaps in a rare cave-type environment. Aquifers may consist of one continuous "layer" or as several layers stacked-up like pancakes.

How Groundwater Moves
Groundwater is added to (recharged) by water seeping down through the ground and is released (discharged) when it intersects a surface body of water such as a lake or stream or when it is pumped out. The surface area below the ground where the soil or rock is water saturated is called the "water table." The water table is not fixed. It can move up and down as water is removed from or added to the aquifer.

In general, groundwater moves slowly. This is an important concept when considering groundwater contamination. The water can move as slowly as a few inches per year in clays. However, if the aquifer consists of loose sand and gravel, the groundwater can move hundreds of feet per year. Like water at the surface, groundwater moves with the gradient (i.e. downhill). However, groundwater can also move as a result of being under pressure. Pressurized water will move from high to low pressure areas. This works under the same principle as any material under pressure, such as fluid in an aerosol can.

FORMATION OF PLUMES

The Transport of Chemicals into Groundwater
Chemicals that are spilled or released into soil may dissolve in any water that is present. In some cases, the chemicals may be transported into groundwater by water slowly seeping downward. How fast this occurs and the details are complex, but water generally moves downward. Lateral movement is generally not significant until water reaches the water table. The contaminant concentration reaching groundwater is less than the concentration at the source because of dilution and breakdown that occur along the way.

As contaminants are slowly transported downward, they can chemically interact with other things in the water or soil. This can temporarily or permanently remove the contamination. Natural defense mechanisms such as biological degradation also act to naturally mitigate contamination to varying extents by removing or altering the contaminants. For instance, some bacteria that live naturally in soil and groundwater can metabolize many of the contaminants in gasoline.

Contaminants become "pollution" if they reach concentrations high enough to be judged harmful to humans or the environment. Groundwater standards are set by the United States Environmental Protection Agency (EPA) and state agencies. Contamination can originate from a "point source" such as a leaking underground tank, or from a "non-point" source such as infiltration from agriculture (i.e. pesticides and fertilizers) or urban run-off (i.e. road salt or trace metals left on roads from tires and car emissions).

When contaminants enter the groundwater, they are slowly dispersed to form a diluted cloud or "plume." Chemical reactions and biological breakdown can continue. Pumping, complex flow patterns, chemical and biological processes all affect the travel, size and shape of plumes. Some contaminants may be removed by a process called "adsorption." Adsorption is the process by which a chemical adheres to grains in the soil. Although this does not remove the contaminant, it may immobilize it and help prevent it from spreading.

The size and extent of plumes are determined using "monitoring wells." Such wells also help track clean-up efforts. Information from monitoring wells and other sources are used to determine appropriate mitigation recommendations. Clean-up methods can vary widely depending on local site conditions.

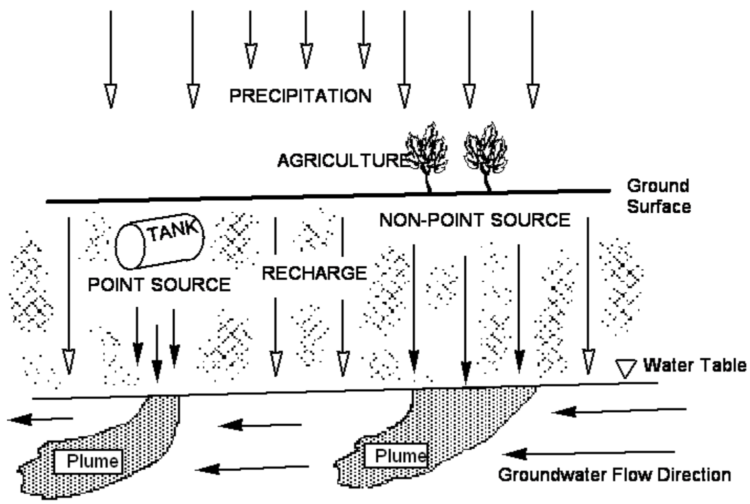

Figure 1. How a contaminant plume forms. A plume forms in the direction of groundwater flow.

LEAKING UNDERGROUND FUEL TANKS

The most common type of contamination comes from leaking underground fuel tanks and piping systems. Underground tanks are common throughout California as well as throughout the United States. These tanks are predominantly used for storing fuel, although solvents used in high technology industries and other substances are stored in this manner also.

Why underground tanks? Many years ago, jurisdictions developed regulations with regards to fuel tanks for the “esthetic” protection of growing cities as well as providing important fire safety measures. For these reasons, the majority of fuel tanks must be buried. Unfortunately, the state building codes that regulate underground fuel tank construction did not keep up with changing technology. The result was that industry used traditional methods in building underground tanks and pipes. Today, there are laws in place that ensure strict building codes are followed in new tank construction, as well as upgrades for all substandard underground tanks.

When an underground tank leaks, the soil and/or groundwater can become contaminated. How much fuel actually gets into the soil depends on how big the leak is and how long the leak continues. Experience shows that leaking fuel “seeps” into the ground at a generally slow rate and usually does not travel very far. “Seeping” fuel into the soil can be likened to wetting the corner of a sponge. With only a small amount of water, only the corner gets wet and the rest of the sponge remains dry.

If a leaking underground fuel tank is discovered, the tank owner or responsible party must notify the appropriate Regional Water Quality Control Board (RWQCB) or county-level agency and submit an “unauthorized release form”. The responsible party must also make every effort to stop the leak and empty the tank if necessary. The RWQCB or county-level agency will then undertake the lead in clean-up efforts, with the tank owner or responsible party reporting directly to them. Until investigation and cleanup are complete, the tank owner or responsible party must submit reports detailing cleanup efforts to the lead agency at least every three months. If the investigation fails to confirm that a leak has actually occurred, no further corrective action will be required. For those Sites that do require corrective action, the cleanup process could take a few months to many years, depending on the severity of the leak.

Additional information may be available through the Public Safety Officer or Hazardous Materials Specialist in the city who is often within the Fire Department or Public Works Department.

WHAT IS A "SUPERFUND" SITE?

"Superfund" is a common term for the "Comprehensive Environmental Response, Compensation, and Liability Act", which was a law enacted by Congress on December 11, 1980, and is enforced by the U.S. Environmental Protection Agency (EPA). This legislation provides funding for clean up at the worst hazardous waste Sites in the United States. Because the moneys involved in clean up are large, this federal statute was dubbed "Superfund."

The purpose of Superfund is to clean up or mitigate hazardous materials that pose an immediate and substantial danger to the public or the environment. This could be a chemical "spill" that requires immediate response or a site that requires long-term clean-up action. The chemicals found at Superfund Sites can vary but some have included familiar contaminants such as arsenic, lead and mercury. Other lesser known contaminants include toluene, pentachlorophenol and vinyl chloride. This Act also holds polluters liable for clean-up expenses as well as forces responsible parties to take clean-up actions.

How does a site get on the Superfund list? Proposed Sites are brought to the EPA's attention in several ways. It could come from notification by the owner, complaints by citizens, identification by a state or local jurisdiction, or by special EPA investigations. A site is then placed on the Superfund, or "National Priorities List" (NPL) once the EPA determines that it represents a long-term threat to public health or the environment. The EPA makes this determination by evaluating such things as the likelihood that a site has released or has the potential to release hazardous substances into the environment, the characteristics of the waste (e.g. toxicity and waste quantity), and the number of people affected by the release.
The government believes that "Superfund" funding is warranted if the site poses a significant and immediate health concern. Even if federal funding is not provided, the site may require action under other statutes.

DRINKING WATER: TAP VS. PRIVATE WELL

Being in proximity to a contaminated site occasionally raises concern regarding the quality of the drinking water and whether or not the contamination is present in that water. One important question to keep in mind is "where does the drinking water come from… a municipal water system or a private well?" The answer to this question will help to resolve the issue of contamination.

In general, homes in urban areas are typically hooked up to a municipal water system. The water from this type of system is commonly referred to as "tap water". Municipal water suppliers are required to meet stringent drinking water standards set forth by the US EPA. These drinking water suppliers provide reports, sometimes called consumer confidence reports, which outline where the water comes from and what substances are in it. The municipal water supplier should be able to provide these reports upon request.

On the other hand, if a home is not hooked up to a municipal water source but instead is using a private well on the property, then the US EPA regulations do not apply. The homeowner is responsible for the quality and safety of the drinking water. Keep in mind that being in proximity to a contaminated site does not necessarily mean the well will be contaminated. There is always the possibility that the contamination could be traveling in the opposite direction to where the private well is located, in which case the well water would remain uncontaminated. Another possibility is that the contamination could be at a much shallower depth than where the private well is drawing water. If the private well is deep, then it possibly can bypass contamination at more shallow depths. In any case, the US EPA recommends that well owners have their water tested annually.

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For additional general information on environmental topics, contact the Public Affairs office of the California Environmental Protection Agency. This agency should be listed in the State government section of the local telephone book. Another good source of information may be found by contacting the environmental or hazardous materials specialist in the City or County Department of Health.