

Chapter 1 : Heating and Cooling Products, Portable Home Appliances - Air & Water

This chapter will not repeat the discussion about indoor air pollution caused by biomass burning and water pollution caused by poor sanitation at the household level, but it will focus on the problems caused by air and water pollution at the community, country, and global levels.

February 27, Viktor Fiker Dreamstime Pollution is the process of making land, water, air or other parts of the environment dirty and not safe or suitable to use. Things as simple as light, sound and temperature can be considered pollutants when introduced artificially into an environment. Toxic pollution affects more than million people worldwide, according to Pure Earth , a non-profit environmental organization. Read on to find out more about specific types of pollution. Land pollution Land can become polluted by household garbage and by industrial waste. In , Americans produced about million tons of solid waste , according to the U. A little over half of the waste “ million tons” was gathered in landfills. Only about 34 percent was recycled or composted. Organic material was the largest component of the garbage generated, the EPA said. Paper and paperboard accounted for more than 26 percent; food was 15 percent and yard trimmings were 13 percent. Plastics comprised about 13 percent of the solid waste, while rubber, leather and textiles made up 9. Wood contributed to 6. Commercial or industrial waste is a significant portion of solid waste. According to the University of Utah , industries use 4 million pounds of materials in order to provide the average American family with needed products for one year. Much of it is classified as non-hazardous, such as construction material wood, concrete, bricks, glass, etc. Hazardous waste is any liquid, solid or sludge waste that contain properties that are dangerous of potentially harmful to human health or the environment. Industries generate hazardous waste from mining, petroleum refining, pesticide manufacturing and other chemical production. Households generate hazardous waste as well, including paints and solvents, motor oil, fluorescent lights, aerosol cans, and ammunition. Water pollution Water pollution happens when chemicals or dangerous foreign substances are introduced to water, including chemicals, sewage, pesticides and fertilizers from agricultural runoff, or metals like lead or mercury. According to the Environmental Protection Agency EPA , 44 percent of assessed stream miles, 64 percent of lakes and 30 percent of bay and estuarine areas are not clean enough for fishing and swimming. These come from the most common sources of contaminates, that include agricultural runoff, air deposition, water diversions and channelization of streams. According to United Nations , million people do not have access to clean water and around 2. Adequate sanitation helps to keep sewage and other contaminants from entering the water supply. According to National Oceanic and Atmospheric Administration NOAA , 80 percent of pollution in marine environment comes from the land through sources like runoff. Water pollution can also severely affect marine life. For example, sewage causes pathogens to grow, while organic and inorganic compounds in water can change the composition of the precious resource. According to the EPA, low levels of dissolved oxygen in the water are also considered a pollutant. Dissolved oxygen is caused by the decomposition of organic materials, such as sewage introduced into the water. Warming water can also be harmful. The artificial warming of water is called thermal pollution. It can happen when a factory or power plant that is using water to cool its operations ends up discharging hot water. This makes the water hold less oxygen, which can kill fish and wildlife. The sudden change of temperature in the body of water can also kill fish. According to the University of Georgia , it is estimated that around half of the water withdrawn from water systems in the United States each year is used for cooling electric power plants. Depending on water flow, the water temperature quickly returns to ambient temperatures that do not harm fish. Nutrient pollution, also called eutrophication, is another type of water pollution. It is when nutrients, such as nitrogen, are added into bodies of water. The nutrient works like fertilizer and makes algae grow at excessive rates, according to NOAA. The algae blocks light from other plants. The plants die and their decomposition leads to less oxygen in the water. Less oxygen in the water kills aquatic animals. Air pollution The air we breathe has a very exact chemical composition; 99 percent of it is made up of nitrogen, oxygen, water vapor and inert gases. A common type of air pollution happens when people release particles into the air from burning fuels. This pollution looks like soot, containing millions of tiny particles, floating in the air. Another common type of air

pollution is dangerous gases, such as sulfur dioxide, carbon monoxide, nitrogen oxides and chemical vapors. These can take part in further chemical reactions once they are in the atmosphere, creating acid rain and smog. Other sources of air pollution can come from within buildings, such as secondhand smoke. Finally, air pollution can take the form of greenhouse gases, such as carbon dioxide or sulfur dioxide, which are warming the planet through the greenhouse effect. According to the EPA, the greenhouse effect is when gases absorb the infrared radiation that is released from the Earth, preventing the heat from escaping. This is a natural process that keeps our atmosphere warm. If too many gases are introduced into the atmosphere, though, more heat is trapped and this can make the planet artificially warm, according to Columbia University. Air pollution kills more than 2 million people each year, according to a study published in the journal of Environmental Research Letters. The effects of air pollution on human health can vary widely depending on the pollutant, according to Hugh Sealy, professor and director of the environmental and occupational health track at the Department of Public Health and Preventive Medicine, St. If the pollutant is highly toxic, the effects on health can be widespread and severe. For example, the release of methyl isocyanate gas at Union Carbide plant in Bhopal in killed over 2, people, and over , suffered respiratory problems. The air pollutant may be carcinogenic e. Other air pollutants like carbon dioxide have an indirect impact on human health through climate change," Sealy told Live Science. Noise pollution happens when the sound coming from planes, industry or other sources reaches harmful levels. Research has shown that there are direct links between noise and health, including stress-related illnesses, high blood pressure, speech interference, hearing loss. For example, a study by the WHO Noise Environmental Burden on Disease working group found that noise pollution may contribute to hundreds of thousands of deaths per year by increasing the rates of coronary heart disease. Noise also makes wild species communicate louder, which can shorten their lifespan. For the natural world, though, lights have changed the way that days and nights work. Some consequences of light pollution are: Some birds sing at unnatural hours in the presence of artificial light. Scientists have determined that long artificial days can affect migration schedules, as they allow for longer feeding times. Streetlights can confuse newly hatched sea turtles that rely on starlight reflecting off the waves to guide them from the beach to the ocean. They often head in the wrong direction. Light pollution, called sky glow, also makes it difficult for astronomers, both professional and amateur, to properly see the stars. According to a study by the American Geophysical Union, light pollution could also be making smog worse by destroying nitrate radicals that helps the dispersion of smog. Turning on so many lights may not be necessary. Research published by International Journal of Science and Research estimates that over-illumination wastes about 2 million barrels of oil per day and lighting is responsible for one-fourth of all energy consumption worldwide. Americans generate 30 billion foam cups, million tires, and 1. According to the WHO, ambient air pollution contributes to 6. The Mississippi River drains the lands of nearly 40 percent of the continental United States. It also carries an estimated 1. Pollution in China can change weather patterns in the United States. It takes just five days for the jet stream to carry heavy air pollution from China to the United States, where it stops clouds from producing rain and snow. About 7 million premature deaths annually linked to air pollution, according to WHO. That is one in eight deaths worldwide.

Chapter 2 : Air Pollution Control Board

Environmental pollution comes in various forms, such as: air pollution, water pollution, soil pollution, etc. Everyone is a stakeholder as we are all inhabitants of this one and only mother earth. Each person can contribute something to advance environmental pollution mitigation measures.

EPA is currently reviewing the adequacy of the ozone and PM 10 standards. Largely in response to a court decision in favor of environmentalists *Sierra Club v. Ruckelshaus*, the amendments included a program for the prevention of significant deterioration PSD of air that was already clean. This program would prevent polluting the air up to the national levels in areas where the air was cleaner than the standards. In Class I areas, areas with near pristine air quality, no new significant air pollution would be allowed. Class I areas are airsheds over larger national parks and wilderness areas. In Class II areas a moderate degree of air quality deterioration would be allowed. And finally, in Class III areas, air deterioration up to the national secondary standards would be allowed. Related to the prevention of significant deterioration is a provision to protect and enhance visibility in national parks and wilderness areas even if the air pollution is not a threat to human health. The impetus of this section of the bill was the growing visibility problem in parks, especially in the Southwest. Throughout the efforts to further amend the Clean Air Act were stymied. President Ronald Reagan was opposed to any strengthening of the Act, which he argued would hurt the economy. In Congress, the controversy over acid rain between members from the Midwest and the Northeast further contributed to the stalemate. Over the next two years, the issues were hammered out between environmentalists and industry and between different regions of the country. Major amendments to the Clean Air Act were finally passed in the fall of 1990. These amendments addressed four major topics: Most of this reduction came from old utility power plants. The law also creates marketable pollution allowances, so that a utility that reduces emissions more than required can sell those pollution rights to another source. Economists argue that such an approach should become more widespread for all pollution control, to the courtesy of U.S. Due to the failure of the toxic air pollutant provisions of the Clean Air Act, new, more stringent provisions were adopted requiring regulations for all major sources of varieties of toxic air pollution within 10 years. Areas of the country still in nonattainment for criteria pollutants will be given from three to 20 years to meet these standards. These areas are also required to impose tighter controls to meet these standards. To help these areas and other parts of the country, the act requires stiffer motor vehicle emissions standards and cleaner gasoline. Finally, three chemical families that contribute to the destruction of the stratospheric ozone layer chlorofluorocarbons [CFCs], hydrochlorofluorocarbons [HCFCs], and methyl chloroform are to be phased out of production and use. The Clean Air Act has met with mixed success. The national average pollutant levels for the criteria pollutants have decreased. Nevertheless, many localities have not achieved these standards and are in perpetual nonattainment. Not surprisingly, major urban areas are those most frequently in nonattainment. The pollutant for which standards are most often exceeded is ozone, or smog. A final point of caution concerning evaluating the Clean Air Act: These changes may be due to shifts in the economy at large, changes in weather patterns, or other such variables. In those cases where topography is a factor in air movement, AQCRs often correspond with airsheds. AQCRs may consist of two or more cities, counties, or other governmental entities, and each region is required to adopt consistent pollution control measures across the political jurisdictions involved. AQCRs may even cross state lines and, in these instances, the states must cooperate in developing pollution control strategies. As of 1990, most AQCRs had achieved national air quality standards; however the remaining AQCRs where standards had not been achieved were a significant group, where a large percentage of the United States population dwelled. AQCRs involving major metro areas like Los Angeles, New York, Houston, Denver, and Philadelphia were not achieving air quality standards because of smog, motor vehicle emissions, and other pollutants. OZONE O₃ is a toxic, colorless gas but can be blue when in high concentration with a characteristic acrid odor. A variant of normal oxygen, it has three oxygen atoms per molecule rather than the usual two. Ozone strongly absorbs ultraviolet radiation at wavelengths of 200-300 nanometers nm with peak absorption at 254 nm. The concentration of ozone in the ozonosphere is 1 molecule per 10¹⁰ molecules, or if the gas

were at standard temperature and pressure, the ozone layer would be 0. Ozone in the stratosphere results from a chemical equilibrium between oxygen, ozone, and ultraviolet radiation. Ultraviolet radiation is absorbed by oxygen and produces ozone. Simultaneously, ozone absorbs ultraviolet radiation and decomposes to oxygen and other products. Ozone layer depletion occurs as a result of complex reactions in the atmosphere between organic compounds that react with ozone faster than the ozone is replenished. Compounds of most concern include the byproducts of ultraviolet degradation of chlorofluorocarbons CFCs, chlorine, and fluorine. Ozone can also be generated in the presence of oxygen from equipment that gives off intense light, electrical sparks, or creates intense static electricity, such as photocopiers and laser printers. Human olfactory senses are very sensitive to ozone, being able to detect ozone odor at concentrations of 0. Toxic symptoms for humans from exposure to ozone include headaches and drying of the throat and respiratory tracts. Ozone is highly toxic to many plant species and destroys or degrades many building materials, such as paint, rubber, and some plastics. The total losses in the United States each year due to ozone damage to crops, livestock, buildings, natural systems, and human health is estimated to be in the tens of billions of dollars. The threshold limit value TLV for air quality standards is 0. Industrial uses of ozone include chemical manufacturing and air, water, and waste treatment. Industrial quantities of ozone are typically generated from air or pure oxygen by means of silent corona discharge. Ozone is used in water treatment as a disinfectant to kill pathogenic microorganisms or for oxidation of organic and inorganic compounds. Combinations of ozone and hydrogen peroxide or ultraviolet radiation in water can generate powerful oxidants useful in breaking down complex synthetic organic compounds. In wastewater treatment, ozone can be used to disinfect effluents, or decrease their color and odor. In some industrial applications, ozone can be used to enhance biodegradation of complex organic molecules. Industrial cooling tower treatment with ozone prevents transmission of airborne pathogenic organisms and can reduce odor. This radiation is harmful and sometimes lethal to wildlife, crops, and vegetation, and can cause fatal skin cancer, cataracts, and immune system damage in humans. Destroying the ozone shield Ozone, a form of oxygen consisting of three atoms of oxygen instead of two, is considered an air pollutant when found at ground levels and is a major component of smog. It is formed by the reaction of various air pollutants in the presence of sunlight. Ozone is also used commercially as a bleaching agent and to purify municipal water supplies. Because of its high rate of breakdown, such ozone never reaches the upper atmosphere. This ozone layer is maintained as follows: The elemental oxygen then attaches to other O_2 molecules to form O_3 . The elemental oxygen generated then finds another O_2 molecule to become O_3 once again. In 1974, chemists F. Sherwood Rowland and Mario J. Molina realized that chlorine from chlorofluorocarbon CFC molecules was capable of breaking down ozone in the stratosphere. In time, evidence began to accumulate that the ozone layer was indeed being broken apart by these industrial chemicals, and to a lesser extent by nitrogen oxide emissions from jet airplanes as well as hydrogen chloride emissions from large volcanic eruptions. When released into the environment, CFCs slowly rise into the upper atmosphere, where they are broken apart by solar radiation. This releases chlorine atoms that act as catalysts, breaking up molecules of ozone by stripping away one of their oxygen atoms. The chlorine atoms, unaltered by the reaction, are each capable of destroying ozone molecules repeatedly. When damage to the ozone layer first became apparent in 1985, propellants in aerosol spray cans were a major source of CFC emissions, and CFC aerosols were banned in the United States in 1995. Production of CFC also known by R or the trade name Freon, used in cooling and refrigeration, ended in 1996, although use is allowed until supplies are depleted. However, CFCs have since remained in widespread use in thermal insulation, as cleaning solvents, and as foaming agents in plastics, resulting in continued and accelerating depletion of stratospheric ozone. The destruction of ozone molecules begins during the long, completely dark, and extremely cold Antarctic winter, when swirling winds and ice clouds begin to form in the lower stratosphere. This ice reacts with chlorine compounds in the stratosphere such as hydrogen chloride and chlorine nitrate that come from the breakdown of CFCs, creating molecules of chlorine. When spring returns in August and September, a seasonal vortex—a rotating air mass—causes the ozone to mix with certain chemicals in the presence of sunlight. This helps break down the chlorine molecules into chlorine atoms, which, in turn, react with and break up the molecules of ozone. A single chlorine, bromine, or nitrogen molecule can break up literally thousands of ozone molecules. This may

have been responsible for a reported increase in skin cancers and damage to some food crops. Some of the data that has been gathered is alarming. The ozone hole over Antarctica was measured at approximately 8. The contiguous 48 states are, by comparison, about 3 million mi², and all of North America covers 9. Researchers attributed the increased thinning not only to industrial chemicals but also to the volcanic eruptions of Mount Pinatubo in the Philippines and Mount Hudson in Chile, which emitted large amounts of sulfur dioxide into the atmosphere. Dangers of ultraviolet radiation The major consequence of the thinning of the ozone layer is the penetration of more solar radiation, especially ultraviolet-B UV-B rays, the most dangerous type, which can be extremely damaging to plants, wildlife, and human health. A decrease in phytoplankton would affect all other creatures higher on the food chain and dependent on them, including zooplankton, microscopic ocean creatures that feed on phytoplankton and are also an essential part of the ocean food chain. And marine phytoplankton are the main food source for krill, tiny Antarctic shrimp that are the major food source for fish, squid, penguins, seals, whales, and other creatures in the Southern Hemisphere. Moreover, phytoplankton are responsible for absorbing, through photosynthesis, great amounts of carbon dioxide CO₂ and releasing oxygen. There are numerous reports, largely unconfirmed, of animals in the southern polar region being harmed by ultraviolet radiation. Rumors abound in Chile, for example, of pets, livestock, sheep, rabbits, and other wildlife getting cataracts, suffering reproductive irregularities, or even being blinded by solar radiation. Many residents of Chile believe these stories, and wear sunglasses, protective clothing, and sun-blocking lotion in the summer, or even stay indoors much of the day when the sun is out. After several days of record low levels of ozone were recorded in October, people reported severe burns from short exposure to sunlight. Sheep and cattle became blind, and some starved because they could not find food. Trees wilted and died, and melanoma-type skin cancers seem to have increased dramatically. Similar stories have been reported from other areas of the Southern Hemisphere. And malignant melanoma, once a rare disorder, is now the fastest rising cancer in the world. Ozone thinning spreads Indeed, ozone layer depletion is spreading at an alarming rate.

Chapter 3 : Pollution - Wikipedia

There is general agreement that we must control pollution of our air, water, and land, but there is considerable dispute over how controls should be designed and how much control is enough.

This entire planet is our home. We are the only species that systematically destroy our own habitat. Because we are all inhabitants on Earth, everyone is a stakeholder, and every person has something to contribute to advance effective pollution prevention awareness. Environmental protection is a natural extension of caring for ourselves, loving our children, and ensuring a sustainable future for generations to come. And, although we can each help combat pollution in our immediate environments, we can do more by working to change legislation and policy on a larger scale. Averting the onset of pollution in any area, be it in air or water or on land, could be the simplest preventive solution. If there are no pollutants, there will be no pollution. And yet, this is easier said than done. Certain bad habits are entrenched and industrial development as we know it seems to involve an expectation of pollution. Even the most simple preventive approaches are often quite complicated, expensive, and difficult for a small business to implement. Still, there are small changes we can make on the individual level that make a difference, both in the short and long term. We know that we can survive without food for several weeks and without water for few days, but without oxygen, we will die in a matter of minutes. What Can I Do? Source A List of Things You Can Do Every action or inaction of any person has an effect on the environment—be it good, neutral, or negative. By becoming aware and doing the right thing, we choose to be part of the solution. Here are some things you can do: Cigarette butts are not biodegradable and contain extremely toxic soluble chemicals. One butt thrown on the ground can remain for up to 25 years, leaking chemicals like arsenic, ammonia, acetone, benzene, cadmium, formaldehyde, lead, and toluene into the environment. Drive an electric or hybrid car or at least one that uses unleaded gasoline. Keep your car in good running condition to avoid emissions. Share a ride or carpool. Choose to walk or ride a bicycle whenever possible. Never use open fires to dispose of waste, especially chemicals and plastic. Adopt the 3 Rs of solid waste management: Use sustainable, reclaimed, or recycled building materials. Start composting leaves and clippings from your yard and food scraps from your kitchen to reduce waste while improving your soil. Use the power supplied abundantly and freely by wind and sun. Hang your laundry to dry to minimize your use of gas or electricity and open a window or put on a sweater rather than turning on the air conditioner or heater. Buy local foods and goods. In this manner, the use of fuel for transporting goods can be minimized. Look around your house or place of business for ways you could conserve water. Use and buy products that are eco-friendly or made with biodegradable materials. Always bring a bag when you shop. Get rid of your lawn: Plant bee-friendly, drought-tolerant, native plants instead. They clean the air, provide oxygen, and beautify your surroundings. Start an anti-litter campaign to educate your community. If you own a business, make sure you have considered the environmental impact of your business practices. Join an Earth Day celebration every April 22nd and consider making its tenets an everyday practice. What you can do to help stop pollution. Do you think people in general are doing enough to prevent pollution?

Chapter 4 : Air Pollution: Sources, Effects, Prevention and Control | Soapboxie

Title 36 MRS sections , , and provide tax exemptions for air and water pollution control facilities certified by the Commissioner of the Department of Environmental Protection. The exemptions are from Maine sales and use tax, and, where applicable, from property tax.

Pollution is now a common place term, that our ears are attuned to. We hear about the various forms of pollution and read about it through the mass media. Air pollution is one such form that refers to the contamination of the air, irrespective of indoors or outside. A physical, biological or chemical alteration to the air in the atmosphere can be termed as pollution. It occurs when any harmful gases, dust, smoke enters into the atmosphere and makes it difficult for plants, animals and humans to survive as the air becomes dirty. Air pollution can further be classified into two sections- Visible air pollution and invisible air pollution. Another way of looking at Air pollution could be any substance that holds the potential to hinder the atmosphere or the well being of the living beings surviving in it. The sustainment of all things living is due to a combination of gases that collectively form the atmosphere; the imbalance caused by the increase or decrease of the percentage of these gases can be harmful for survival. Read here more about 40 facts of air pollution. The Ozone layer considered crucial for the existence of the ecosystems on the planet is depleting due to increased pollution. Global warming , a direct result of the increased imbalance of gases in the atmosphere has come to be known as the biggest threat and challenge that the contemporary world has to overcome in a bid for survival. Types of Pollutants In order to understand the causes of Air pollution, several divisions can be made. Primarily air pollutants can be caused by primary sources or secondary sources. The pollutants that are a direct result of the process can be called primary pollutants. A classic example of a primary pollutant would be the sulfur-dioxide emitted from factories Secondary pollutants are the ones that are caused by the inter mingling and reactions of primary pollutants. Smog created by the interactions of several primary pollutants is known to be as secondary pollutant. Causes of Air pollution 1. Burning of Fossil Fuels: Sulfur dioxide emitted from the combustion of fossil fuels like coal, petroleum and other factory combustibles is one the major cause of air pollution. Pollution emitting from vehicles including trucks, jeeps, cars, trains, airplanes cause immense amount of pollution. We rely on them to fulfill our daily basic needs of transportation. But, there overuse is killing our environment as dangerous gases are polluting the environment. Carbon Monoxide caused by improper or incomplete combustion and generally emitted from vehicles is another major pollutant along with Nitrogen Oxides, that is produced from both natural and man made processes. Ammonia is a very common by product from agriculture related activities and is one of the most hazardous gases in the atmosphere. Use of insecticides, pesticides and fertilizers in agricultural activities has grown quite a lot. They emit harmful chemicals into the air and can also cause water pollution. Exhaust from factories and industries: Manufacturing industries release large amount of carbon monoxide, hydrocarbons, organic compounds, and chemicals into the air thereby depleting the quality of air. Manufacturing industries can be found at every corner of the earth and there is no area that has not been affected by it. Petroleum refineries also release hydrocarbons and various other chemicals that pollute the air and also cause land pollution. Mining is a process wherein minerals below the earth are extracted using large equipments. During the process dust and chemicals are released in the air causing massive air pollution. This is one of the reason which is responsible for the deteriorating health conditions of workers and nearby residents. Household cleaning products, painting supplies emit toxic chemicals in the air and cause air pollution. Have you ever noticed that once you paint walls of your house, it creates some sort of smell which makes it literally impossible for you to breathe. Suspended particulate matter popular by its acronym SPM, is another cause of pollution. Referring to the particles afloat in the air, SPM is usually caused by dust, combustion etc. Effects of Air pollution 1. Respiratory and heart problems: The effects of Air pollution are alarming. They are known to create several respiratory and heart conditions along with Cancer, among other threats to the body. Several millions are known to have died due to direct or indirect effects of Air pollution. Children in areas exposed to air pollutants are said to commonly suffer from pneumonia and asthma. Another direct effect is the immediate alterations

that the world is witnessing due to Global warming. Harmful gases like nitrogen oxides and sulfur oxides are released into the atmosphere during the burning of fossil fuels. When it rains, the water droplets combine with these air pollutants, become acidic and then fall on the ground in the form of acid rain. Acid rain can cause great damage to human, animals and crops. The green colored algae that is present on lakes and ponds is due to the presence of this chemical only. Just like humans, animals also face some devastating effects of air pollution. Toxic chemicals present in the air can force wildlife species to move to new places and change their habitat. The toxic pollutants deposit over the surface of the water and can also affect sea animals. Depletion of Ozone layer: As the ozone layer will go thin, it will emit harmful rays back on earth and can cause skin and eye related problems. UV rays also have the capability to affect crops. When you try to study the sources of Air pollution, you enlist a series of activities and interactions that create these pollutants. There are two types of sources that we will take a look at: Natural sources and Man-made sources. Natural sources of pollution include dust carried by the wind from locations with very little or no green cover, gases released from the body processes of living beings Carbon dioxide from humans during respiration, Methane from cattle during digestion, Oxygen from plants during Photosynthesis. Smoke from the combustion of various inflammable objects, volcanic eruptions etc along with the emission of polluted gases also make it to the list of Natural sources of Pollution. While looking at the man-made contributions towards air pollution, smoke again features as a prominent component. The smoke emitted from various forms of combustion like in bio mass , factories, vehicles, furnaces etc. Waste used to create landfills generate methane, that is harmful in several ways. The reactions of certain gases and chemicals also form harmful fumes that can be dangerous to the well being of living creatures. Solutions for Air Pollution 1. Use public mode of transportation: Encourage people to use more and more public modes of transportation to reduce pollution. Also, try to make use of car pooling. If you and your colleagues come from the same locality and have same timings you can explore this option to save energy and money. Switch off fans and lights when you are going out. Large amount of fossil fuels are burnt to produce electricity. You can save the environment from degradation by reducing the amount of fossil fuels to be burned. Understand the concept of Reduce, Reuse and Recycle: Do not throw away items that are of no use to you. In-fact reuse them for some other purpose. Emphasis on clean energy resources: Clean energy technologies like solar , wind and geothermal are on high these days. Governments of various countries have been providing grants to consumers who are interested in installing solar panels for their home. This will go a long way to curb air pollution. Use energy efficient devices: CFL lights consume less electricity as against their counterparts. They live longer, consume less electricity, lower electricity bills and also help you to reduce pollution by consuming less energy. Several attempts are being made world wide on a personal, industrial and governmental levels to curb the intensity at which Air Pollution is rising and regain a balance as far as the proportions of the foundation gases are concerned. This is a direct attempt at slacking Global warming. We are seeing a series of innovations and experiments aimed at alternate and unconventional options to reduce pollutants.

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By carefully investigating the early stages of design and development in industrial processes e.g., those methods which have minimum air pollution potential can be selected to accomplish air-pollution control at source itself.

Pollution in the Lachine Canal , Canada Water is typically referred to as polluted when it is impaired by anthropogenic contaminants. Due to these contaminants it either does not support a human use, such as drinking water , or undergoes a marked shift in its ability to support its biotic communities, such as fish. Natural phenomena such as volcanoes , algae blooms , storms, and earthquakes also cause major changes in water quality and the ecological status of water. Water pollution is a major global problem. It requires ongoing evaluation and revision of water resource policy at all levels international down to individual aquifers and wells. It has been suggested that water pollution is the leading worldwide cause of death and diseases, [2] [1] and that it accounts for the deaths of more than 14, people daily. An estimated people in India die of water pollution related illness including waterborne diseases every day. For example, in a report on water quality in the United States in , 44 percent of assessed stream miles, 64 percent of assessed lake acres, and 30 percent of assessed bays and estuarine square miles were classified as polluted. Nutrient pollution Surface water pollution includes pollution of rivers, lakes and oceans. A subset of surface water pollution is marine pollution. Marine pollution Main article: Marine pollution A polluted river draining an abandoned copper mine on Anglesey One common path of entry by contaminants to the sea are rivers. An example is directly discharging sewage and industrial waste into the ocean. Pollution such as this occurs particularly in developing nations. Large gyres vortexes in the oceans trap floating plastic debris. Plastic debris can absorb toxic chemicals from ocean pollution, potentially poisoning any creature that eats it. This results in obstruction of digestive pathways, which leads to reduced appetite or even starvation. There are a variety of secondary effects stemming not from the original pollutant, but a derivative condition. An example is silt -bearing surface runoff , which can inhibit the penetration of sunlight through the water column, hampering photosynthesis in aquatic plants. Groundwater pollution Main article: Groundwater pollution Interactions between groundwater and surface water are complex. Consequently, groundwater pollution, also referred to as groundwater contamination, is not as easily classified as surface water pollution. The distinction of point vs. Analysis of groundwater contamination may focus on soil characteristics and site geology, hydrogeology , hydrology , and the nature of the contaminants. Causes of groundwater pollution include: Categories of pollution sources Surface water and groundwater have often been studied and managed as separate resources even though they are interrelated. Conversely, groundwater can also feed surface water sources. Sources of surface water pollution are generally grouped into two categories based on their origin. Point sources Further information: United States regulation of point source water pollution Point source water pollution refers to contaminants that enter a waterway from a single, identifiable source, such as a pipe or ditch. Examples of sources in this category include discharges from a sewage treatment plant , a factory, or a city storm drain. This type of pollution is often the cumulative effect of small amounts of contaminants gathered from a large area. A common example is the leaching out of nitrogen compounds from fertilized agricultural lands. Blue drain and yellow fish symbol used by the UK Environment Agency to raise awareness of the ecological impacts of contaminating surface drainage Contaminated storm water washed off of parking lots , roads and highways, called urban runoff , is sometimes included under the category of non-point sources. However, because this runoff is typically channeled into storm drain systems and discharged through pipes to local surface waters, it becomes a point source. Contaminants and their sources Further information: Wastewater , Sewage , and Industrial wastewater The specific contaminants leading to pollution in water include a wide spectrum of chemicals , pathogens , and physical changes such as elevated temperature and discoloration. While many of the chemicals and substances that are regulated may be naturally occurring calcium , sodium , iron, manganese , etc. High concentrations of naturally occurring substances can have negative impacts on aquatic flora and fauna. Oxygen -depleting substances may be natural materials such as plant matter e. Other natural and anthropogenic substances may cause turbidity cloudiness which blocks light and disrupts plant

growth, and clogs the gills of some fish species. Eutrophication is an increase in the concentration of chemical nutrients in an ecosystem to an extent that increases the primary productivity of the ecosystem. Depending on the degree of eutrophication, subsequent negative environmental effects such as anoxia oxygen depletion and severe reductions in water quality may occur, affecting fish and other animal populations. Pathogens Poster to teach people in South Asia about human activities leading to the pollution of water sources A manhole cover unable to contain a sanitary sewer overflow. Fecal sludge collected from pit latrines is dumped into a river at the Korogocho slum in Nairobi , Kenya. Disease-causing microorganisms are referred to as pathogens. Pathogens can produce waterborne diseases in either human or animal hosts. Other microorganisms sometimes found in contaminated surface waters that have caused human health problems include:

Chapter 6 : Summary of the Clean Water Act | Laws & Regulations | US EPA

Air and Water Pollution Control & Conservation Committee. To conduct continuing studies of air and water pollution laws and their enforcement and to recommend.

In , there were 44 air pollution alerts. Much progress has been made due to the efforts of Ohio EPA, local air agencies that contract with Ohio EPA, industry environmental professionals and active citizens. It is truly a collaborative effort to achieve clean, healthy air. Mission Statement To attain and maintain the air quality at a level that will protect the environment for the benefit of all. These standards were the first step in the move toward cleaning up our air. Establish and maintain a comprehensive ambient air monitoring network to measure progress in meeting the NAAQS. Conduct special air monitoring and air toxics analysis. Develop state-level air pollution control regulations in support of a federally approved State Implementation Plan SIP that also conforms to Ohio law. Issue permits to regulated sources in order to institute enforceable limits on emissions of air contaminants that otherwise would be released to the atmosphere. Conduct inspections and other compliance oversight activities, including pursuing enforcement against permitted or allowable emissions of air contaminants. This inventory was established under the Emergency Planning and Community Right-to-Know Act of EPCRA , which Congress passed to promote planning for chemical emergencies, and to provide information to the public about presence and release of toxic and hazardous chemicals in their communities. TRI does not regulate chemical discharges. The intent of section r is to prevent accidental releases to the air and mitigate the consequences of releases that do occur by focusing on prevention measures on chemicals that pose the greatest risk to the public and the environment. Under these requirements, industry has an obligation to prevent accidents and operate safely. DAPC staff assure compliance with these obligations. Regulate asbestos removal activities to ensure safe asbestos removal. Respond to open burning complaints and provide ongoing compliance activities associated with open burning. Perform technical evaluation and review of any property sought for tax exemption status for the Ohio Department of Taxation. The air and noise pollution control tax exemption program was originally established by legislation in The program allows companies to receive tax exemptions for the installation of air or noise pollution control property, and is administered by the Ohio Department of Taxation. SERC is made up of nine state agencies: Additionally, SERC has 10 appointed members: Also, two members of the legislature serves as non-voting members. Among other activities, staff in these offices perform the following critical functions: These agencies pre-date Ohio EPA and typically are part of a city, county, or health district organization. Below are links to the main web pages for each local air agency.

Chapter 7 : Missouri Department of Natural Resources

The Division of Air Pollution Control (DAPC) ensures compliance with the federal Clean Air Act and the Emergency Planning and Community Right-to-Know Act as part of its mission to attain and maintain air quality at a level that protects the environment and public health.

We are the only species that systematically destroy our own habitat. Environmental pollution comes in various forms, such as: Everyone is a stakeholder as we are all inhabitants of this one and only mother earth. Each person can contribute something to advance environmental pollution mitigation measures. Environmental protection means caring for our resources and subsequently for ourselves and ensuring a sustainable future for generations to come will have a better environment. Help stop pollution today. Although on an individual basis, we can help combat pollution in our own immediate environment, efficient control can be best institutionalized through legislation. Thus, most countries have already addressed the issue by passing some form of pollution prevention measures. Phytoremediation- Solution to Contaminated Environment Averting the onset of pollution in any area; i. This calls for a conscientious effort to adopt good practices or habits by the people, the passage and the proper implementation of appropriate government laws and strict compliance especially by potential industrial pollutants. If there are no pollutants, there will be no pollution. And yet, this is easier said than done. Certain bad habits are entrenched and industrial development somehow carries with it the concomitant burden of pollution. The cost to business and its commercial ramifications make this rather simple preventive approach quite complicated and more difficult to implement. Everyone can help by self education and by adopting good and healthy practices. It is also important that we help raise awareness about the significance of environmental issues, their dire consequences and what can be done. Bioremediation- The New Age Cleansing Technology of the Environment Every action or inaction of any person in regard to her or his surroundings has an effect- be it good, neutral or bad- on the environment. Nature already provides for our needs. Whatever we do to it gets back to us. If we are friends of the earth, it will also be friendly to us. By becoming aware and doing the right action, we choose to be part of the solution. What comes to mind now to serve as reminders include the following: Use unleaded gasoline in your cars. Keep your car properly maintained to keep it in good running condition to avoid smoke emissions. Share a ride or engage in car pooling. Instead of using your cars, choose to walk or ride a bicycle whenever possible. With this eco-friendly practice, you will also be healthier and happier by staying fit. Never use open fires to dispose of wastes. Adopt the 3Rs of solid waste management: Inorganic materials such as metals, glass and plastic ; also organic materials like paper, can be reclaimed and recycled. This takes into account that the proven solution to the problem of proper waste management especially in third world countries is proper disposal in waste bins for collection and not in the street where it could fall into drains , waste segregation and collection, and recycling. Start composting brown leaves in your yard and green scraps from your kitchen. It will reduce waste while improving your yard and garden soils. Live green by using green power supplied abundantly and freely by wind and the sun. Hang your laundry to dry to minimize use of gas or electricity from your dryers. Enjoy fresh air from open windows to lessen the use of air conditioning system. Patronize local foods and goods. In this manner, transporting goods and foods prepared with GMOs which uses fuel from conventional energy sources will be minimized. Use eco-friendly or biodegradable materials instead of plastic which are made up of highly toxic substances injurious to your health. Create your green space. Plant more trees and put indoor plants in your homes. They clean the air, provide oxygen and beautify your surroundings. Thus, care for them and by protecting them, especially the big trees around and in the forest, you protect yourself and your family, too. Have a proper waste disposal system especially for toxic wastes Take very good care of your pets and their wastes. Never throw, run or drain or dispose into the water, air, or land any substance in solid, liquid or gaseous form that shall cause pollution. Do not cause loud noises and unwanted sounds to avoid noise pollution. Do not litter in public places. Anti-litter campaigns can educate the populace. Industries should use fuel with lower sulphur content. Industries should monitor their air emissions regularly and take measures to ensure compliance with the prescribed emission standards. Industries should strictly follow applicable

government regulations on pollution control. Organic waste should be dumped in places far from residential areas. Conclusion Breathing is life. We know that we will survive without food for several weeks and without water for few days, but without oxygen, we will die in a matter of minutes. The oxygen, the air we breathe sustains us. So, let us make today and everyday a good day for everyone. Allow the earth to have more clean air. Earth eventually had an atmosphere incompatible with life. Nevertheless, life on earth took care of itself. In the thinking of the human being a hundred years is a long time. It was a whole different world, but to the earth, a hundred years is nothing. A million years is nothing. This planet lives and breathes on a much vaster scale. If we are gone tomorrow, the earth will not miss us. We must help fight Global Warming by doing the following steps:

Chapter 8 : Environmental Pollution Control – Water, Air and Land - Green Clean Guide

Air pollution has been linked to health problems like asthma and lung disease, as well as the deterioration of the ozone layer (which protects us from harmful UV rays) and the warming of the earth.

Contact Author Air Pollution-It is an undesirable change in the physical, chemical or biological characteristics of air. Air Pollutants-They are the substances which pollute the air. Some of the common pollutants are dust, soot, ash, carbon monoxide, excess of carbon dioxide, sulphur dioxide, oxides of nitrogen, hydrocarbons, chlorofluorocarbons CFC , lead compounds, asbestos dust, cement dust, pollens and radioactive rays. Source The pollution of air can be caused by natural processes or by human activities. The sources of air pollution are classified into two groups: Natural Sources Man made sources Natural Sources of Air Pollution-They are dust storms, forest fires, ash from smoking volcanoes, decay of organic matters and pollen grains floating in air. Manmade Sources of Air Pollution-They are population explosion, deforestation, urbanisation and industrialisation, whose effects can be explained as follows: Burning of fuels like wood, cow dung cakes, coal and kerosene in homes pollute the air. Exhaust gases emitted by motor vehicles which pollute the air are the major source of air pollution in big cities. Industries pollute air by releasing various types of pollutants such as sulphur dioxide, oxides of carbon, nitrogen oxide, chlorine, asbestos dust and cement dust. Thermal power plants pollute air by emitting sulphur dioxide and fly-ash. Nuclear power plants pollute air by releasing radioactive rays. Use of fertilisers and pesticides in agriculture pollute the air. Mining activities releases particulate matter into the air and pollutes it. Indiscriminate cutting of trees and clearing of forests increases the amount of carbon dioxide in the atmosphere and thereby pollutes it. Use of chlorofluorocarbons in refrigeration, fire extinguishers and aerosol sprayers pollutes air by depleting the ozone layer. Smoking pollutes air by emitting carbon monoxide and nicotine. Source Harmful Effects of Air Pollution Air pollution affects respiratory system causing breathing difficulties and diseases such as bronchitis, asthma, lung cancer, tuberculosis and pneumonia. It affects the central nervous system causing carbon monoxide poisoning. CO has more affinity for haemoglobin than oxygen and thus forms a stable compound carboxy haemoglobin COHb , which is poisonous and causes suffocation and death. It causes depletion of ozone layer due to which ultraviolet radiations can reach the earth and cause skin cancer, damage to eyes and immune system. It causes acid rain which damages crop plants, trees, buildings, monuments, statues and metal structures and also makes the soil acidic. The increased temperature may cause melting of ice caps and glaciers, resulting in floods. Air pollution from certain metals, pesticides and fungicides causes serious ailments. Lead pollution causes anaemia, brain damage, convulsions and death. Certain metals cause problem in kidney, liver, circulatory system and nervous system. Fungicides cause nerve damage and death. Pesticides like DDT Dichloro diphenyl trichloroethane which are toxic enter into our food chain and gets accumulated in the body causing kidney disorders and problems of brain and circulatory system. Methods of controlling gaseous pollutants-The air pollution caused by gaseous pollutants like hydrocarbons, sulphur dioxide, ammonia, carbon monoxide, etc can be controlled by using three different methods-Combustion, Absorption and Adsorption. Combustion-This technique is applied when the pollutants are organic gases or vapours. Absorption-In this method, the polluted air containing gaseous pollutants is passed through a scrubber containing a suitable liquid absorbent. The liquid absorbs the harmful gaseous pollutants present in air. Adsorption-In this method, the polluted air is passed through porous solid adsorbents kept in suitable containers. The gaseous pollutants are adsorbed at the surface of the porous solid and clean air passes through. Methods of controlling particulate emissions-The air pollution caused by particulate matter like dust, soot, ash, etc can be controlled by using fabric filters, wet scrubbers, electrostatic precipitators and certain mechanical devices. Mechanical Devices-It works on the basis of following: Gravity-In this process, the particulate settle down by the action of gravitational force and get removed. Sudden change in the direction of air flow-It brings about separation of particles due to greater momentum. Fabric Filters-The particulate matter is passed through a porous medium made of woven or filled fabrics. The particulate present in the polluted air are filtered and gets collected in the fabric filters, while the gases are discharged. Electrostatic Precipitators-When the polluted air containing particulate pollutants is

passed through an electrostatic precipitator, it induces electric charge on the particles and then the aerosol particles get precipitated on the electrodes. Some other methods of controlling Air Pollution: Tall chimneys should be installed in factories. Better designed equipment and smokeless fuels should be used in homes and industries. Renewable and non-polluting sources of energy like solar energy, wind energy, etc should be used. Automobiles should be properly maintained and adhere to emission control standards. More trees should be planted along roadsides and houses.

Chapter 9 : Division of Air Pollution Control

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. The basis of the CWA was enacted in and was called the Federal Water Pollution Control Act, but the Act was significantly reorganized and expanded in

Pollution started from prehistoric times, when man created the first fires. According to an article in the journal *Science*, "soot" found on ceilings of prehistoric caves provides ample evidence of the high levels of pollution that was associated with inadequate ventilation of open fires. Core samples of glaciers in Greenland indicate increases in pollution associated with Greek, Roman, and Chinese metal production. The Industrial Revolution brought an infusion of untreated chemicals and wastes into local streams that served as the water supply. King Edward I of England banned the burning of sea-coal by proclamation in London in 1266, after its smoke became a problem; [6] [7] the fuel was so common in England that this earliest of names for it was acquired because it could be carted away from some shores by the wheelbarrow. It was the industrial revolution that gave birth to environmental pollution as we know it today. London also recorded one of the earlier extreme cases of water quality problems with the Great Stink on the Thames of 1859, which led to construction of the London sewerage system soon afterward. Pollution issues escalated as population growth far exceeded viability of neighborhoods to handle their waste problem. Reformers began to demand sewer systems and clean water. August Bebel recalled conditions before a modern sewer system was built in the late 19th century: There were no public toilets in the streets or squares. Visitors, especially women, often became desperate when nature called. In the public buildings the sanitary facilities were unbelievably primitive. As a metropolis, Berlin did not emerge from a state of barbarism into civilization until after 1871. A British expert in 1875 concluded that Berlin represented "the most complete application of science, order and method of public life," adding "it is a marvel of civic administration, the most modern and most perfectly organized city that there is. Chicago and Cincinnati were the first two American cities to enact laws ensuring cleaner air in 1887. Pollution became a major issue in the United States in the early twentieth century, as progressive reformers took issue with air pollution caused by coal burning, water pollution caused by bad sanitation, and street pollution caused by the 3 million horses who worked in American cities in 1900, generating large quantities of urine and manure. As historian Martin Melosi notes, "The generation that first saw automobiles replacing the horses saw cars as 'miracles of cleanliness. Extreme smog events were experienced by the cities of Los Angeles and Donora, Pennsylvania in the late 19th century, serving as another public reminder. Awareness of atmospheric pollution spread widely after World War II, with fears triggered by reports of radioactive fallout from atomic warfare and testing. National news stories in the late 1940s—especially the long-term dioxin contamination at Love Canal starting in 1976 and uncontrolled dumping in Valley of the Drums—led to the Superfund legislation of 1980. The development of nuclear science introduced radioactive contamination, which can remain lethally radioactive for hundreds of thousands of years. Lake Karachay—named by the Worldwatch Institute as the "most polluted spot" on earth—served as a disposal site for the Soviet Union throughout the 1950s and 1960s. Chelyabinsk, Russia, is considered the "Most polluted place on the planet". The toll on the worst-affected populations and the growth since then in understanding about the critical threat to human health posed by radioactivity has also been a prohibitive complication associated with nuclear power. Though extreme care is practiced in that industry, the potential for disaster suggested by incidents such as those at Three Mile Island and Chernobyl pose a lingering specter of public mistrust. Worldwide publicity has been intense on those disasters. The borderless nature of atmosphere and oceans inevitably resulted in the implication of pollution on a planetary level with the issue of global warming. Though their effects remain somewhat less well understood owing to a lack of experimental data, they have been detected in various ecological habitats far removed from industrial activity such as the Arctic, demonstrating diffusion and bioaccumulation after only a relatively brief period of widespread use. A much more recently discovered problem is the Great Pacific Garbage Patch, a huge concentration of plastics, chemical sludge and other debris which has been collected into a large area of the Pacific Ocean by the North Pacific Gyre. This is a less well known pollution problem than the others described above, but nonetheless has

multiple and serious consequences such as increasing wildlife mortality, the spread of invasive species and human ingestion of toxic chemicals. Organizations such as 5 Gyres have researched the pollution and, along with artists like Marina DeBris, are working toward publicizing the issue. Pollution introduced by light at night is becoming a global problem, more severe in urban centres, but nonetheless contaminating also large territories, far away from towns. Blue drain and yellow fish symbol used by the UK Environment Agency to raise awareness of the ecological impacts of contaminating surface drainage. The major forms of pollution are listed below along with the particular contaminant relevant to each of them: Common gaseous pollutants include carbon monoxide, sulfur dioxide, chlorofluorocarbons (CFCs) and nitrogen oxides produced by industry and motor vehicles. Photochemical ozone and smog are created as nitrogen oxides and hydrocarbons react to sunlight. Particulate matter, or fine dust is characterized by their micrometre size PM10 to PM2.5. Radioactive contamination, resulting from 20th century activities in atomic physics, such as nuclear power generation and nuclear weapons research, manufacture and deployment. See alpha emitters and actinides in the environment. Thermal pollution, is a temperature change in natural water bodies caused by human influence, such as use of water as coolant in a power plant. Water pollution, by the discharge of wastewater from commercial and industrial waste intentionally or through spills into surface waters; discharges of untreated domestic sewage, and chemical contaminants, such as chlorine, from treated sewage; release of waste and contaminants into surface runoff flowing to surface waters including urban runoff and agricultural runoff, which may contain chemical fertilizers and pesticides; also including human feces from open defecation - still a major problem in many developing countries; groundwater pollution from waste disposal and leaching into the ground, including from pit latrines and septic tanks; eutrophication and littering.

Pollutant A pollutant is a waste material that pollutes air, water, or soil. Three factors determine the severity of a pollutant: Cost of pollution Pollution has a cost. A manufacturing activity that causes air pollution is an example of a negative externality in production. Because responsibility or consequence for self-directed action lies partly outside the self, an element of externalization is involved. If there are external benefits, such as in public safety, less of the good may be produced than would be the case if the producer were to receive payment for the external benefits to others. However, goods and services that involve negative externalities in production, such as those that produce pollution, tend to be over-produced and underpriced since the externality is not being priced into the market. Sometimes firms choose, or are forced by regulation, to reduce the amount of pollution that they are producing. The associated costs of doing this are called abatement costs, or marginal abatement costs if measured by each additional unit. This utility comes from the consumption of goods and services that create pollution. Therefore, it is important that policymakers attempt to balance these indirect benefits with the costs of pollution in order to achieve an efficient outcome. It is possible to use environmental economics to determine which level of pollution is deemed the social optimum. At this point the damage of one extra unit of pollution to society, the marginal cost of pollution, is exactly equal to the marginal benefit of consuming one more unit of the good or service. If the social costs of pollution are higher than the private costs incurred by the firm, then the true supply curve will be higher. The point at which the social marginal cost and market demand intersect gives the socially optimal level of pollution. At this point, the quantity will be lower and the price will be higher in comparison to the free market equilibrium. Some examples include tariffs, a carbon tax and cap and trade systems.

Sources and causes Play media Air pollution produced by ships may alter clouds, affecting global temperatures. Air pollution comes from both natural and human-made anthropogenic sources. However, globally human-made pollutants from combustion, construction, mining, agriculture and warfare are increasingly significant in the air pollution equation. Principal stationary pollution sources include chemical plants, coal-fired power plants, oil refineries, [38] petrochemical plants, nuclear waste disposal activity, incinerators, large livestock farms dairy cows, pigs, poultry, etc. Agricultural air pollution comes from contemporary practices which include clear felling and burning of natural vegetation as well as spraying of pesticides and herbicides [39] About million metric tons of hazardous wastes are generated each year. Humans have ways to cut greenhouse gas emissions and avoid the consequences of global warming, a major climate report concluded. In a series of press reports culminating in a book called *Fateful Harvest* unveiled a widespread practice of recycling industrial byproducts into

fertilizer, resulting in the contamination of the soil with various metals. Ordinary municipal landfills are the source of many chemical substances entering the soil environment and often groundwater, emanating from the wide variety of refuse accepted, especially substances illegally discarded there, or from pre landfills that may have been subject to little control in the U. There have also been some unusual releases of polychlorinated dibenzodioxins, commonly called dioxins for simplicity, such as TCDD. For example, hurricanes often involve water contamination from sewage, and petrochemical spills from ruptured boats or automobiles. Larger scale and environmental damage is not uncommon when coastal oil rigs or refineries are involved. Some sources of pollution, such as nuclear power plants or oil tankers, can produce widespread and potentially hazardous releases when accidents occur. In the case of noise pollution the dominant source class is the motor vehicle, producing about ninety percent of all unwanted noise worldwide. Ozone pollution can cause respiratory disease, cardiovascular disease, throat inflammation, chest pain, and congestion. Water pollution causes approximately 14, deaths per day, mostly due to contamination of drinking water by untreated sewage in developing countries. An estimated million Indians have no access to a proper toilet, [52] [53] Over ten million people in India fell ill with waterborne illnesses in, and 1, people died, most of them children. Noise pollution induces hearing loss, high blood pressure, stress, and sleep disturbance. Mercury has been linked to developmental deficits in children and neurologic symptoms. Older people are majorly exposed to diseases induced by air pollution. Those with heart or lung disorders are at additional risk. Children and infants are also at serious risk. Lead and other heavy metals have been shown to cause neurological problems. Chemical and radioactive substances can cause cancer and as well as birth defects. An October study by the Lancet Commission on Pollution and Health found that global pollution, specifically toxic air, water, soils and workplaces, kill nine million people annually, which is triple the number of deaths caused by AIDS, tuberculosis and malaria combined, and 15 times higher than deaths caused by wars and other forms of human violence. There are a number of effects of this: Biomagnification describes situations where toxins such as heavy metals may pass through trophic levels, becoming exponentially more concentrated in the process. The emission of greenhouse gases leads to global warming which affects ecosystems in many ways. Invasive species can out compete native species and reduce biodiversity. Invasive plants can contribute debris and biomolecules allelopathy that can alter soil and chemical compositions of an environment, often reducing native species competitiveness. Nitrogen oxides are removed from the air by rain and fertilise land which can change the species composition of ecosystems. Smog and haze can reduce the amount of sunlight received by plants to carry out photosynthesis and leads to the production of tropospheric ozone which damages plants. Soil can become infertile and unsuitable for plants. This will affect other organisms in the food web. Sulfur dioxide and nitrogen oxides can cause acid rain which lowers the pH value of soil. Organic pollution of watercourses can deplete oxygen levels and reduce species diversity. This web site includes links to databases, bibliographies, tutorials, and other scientific and consumer-oriented resources. Worker productivity A number of studies show that pollution has an adverse effect on the productivity of both indoor and outdoor workers. Pollution control A litter trap catches floating waste in the Yarra River, east-central Victoria, Australia Air pollution control system, known as a Thermal oxidizer, decomposes hazard gases from industrial air streams at a factory in the United States of America. Pollution control is a term used in environmental management. It means the control of emissions and effluents into air, water or soil.