Sewage: can refer to domestic and industrial waste. Domestic sewage includes toilet water, bath and shower water, and water from clothes and dish washing. As a result, domestic sewage can be a complex mixture of human waste, cleaning chemicals, skin, hair, and improperly discarded medications. Industrial waste is a nebulous term that includes waste from offices and commercial businesses, as well as large chemical and industrial plants. (Rowena H. Gee 2015) Sewage treatment: is a type of wastewater treatment which aims to remove contaminants from sewage to produce an effluent that is suitable to discharge to the surrounding environment or an intended reuse application, thereby preventing water pollution from raw sewage discharges. (Archis, Apr 19, 2024) Direct discharge of sewage Many ancient cities had drainage systems, but they were primarily intended to carry rainwater away from roofs and pavements. A notable example is the drainage system of ancient Rome. It included many surface conduits that were connected to a large vaulted channel called the Cloaca Maxima ("Great Sewer"), which carried drainage water to the Tiber River. Built of stone and on a grand scale, the Cloaca Maxima is one of the oldest existing monuments of Roman engineering. There was little progress in urban drainage or sewerage during the Middle Ages. Privy vaults and cesspools were used, but most wastes were simply dumped into gutters to be flushed through the drains by floods. Toilets (water closets) were installed in houses in the early 19th century, but they were usually connected to cesspools, not to sewers. In densely populated areas, local conditions soon became intolerable because the cesspools were seldom emptied and frequently overflowed. The threat to public health became apparent. In England in the middle of the 19th century, outbreaks of cholera were traced directly to well–water supplies contaminated with human waste from privy vaults and cesspools. It soon became necessary for all water closets in the larger towns to be connected directly to the storm sewers. This transferred sewage from the ground near houses to nearby bodies of water. Thus, a new problem emerged: surface water pollution. (Archis, Apr 19, 2024) Developments in sewage treatment It used to be said that "the solution to pollution is dilution." When small amounts of sewage are discharged into a flowing body of water, a natural process of stream self–purification occurs. Densely populated communities generate such large quantities of sewage, however, that dilution alone does not prevent pollution. This makes it necessary to treat or purify wastewater to some degree before disposal. The construction of centralized sewage treatment plants began in the late 19th and early 20th centuries, principally in the United Kingdom and the United States. Instead of discharging sewage directly into a nearby body of water, it was first passed through a combination of physical, biological, and chemical processes that removed some or most of the pollutants. Also beginning in the 1900s, new sewage–collection systems were designed to separate storm water from domestic wastewater, so that treatment plants did not become overloaded during periods of wet weather. After the middle of the 20th century, increasing public concern for environmental quality led to broader and more stringent regulation of wastewater disposal practices. Higher levels of treatment were required. For example, pretreatment of industrial wastewater, with the aim of preventing toxic chemicals from interfering with the biological processes used at sewage treatment plants, often became a necessity. In fact, wastewater treatment technology advanced to the point where it became possible to remove virtually all pollutants from sewage. This was so expensive, however, that such high levels of treatment were not usually justified. (

Archis, Apr 19, 2024) Let’s explore the different stages of sewage treatment: Primary Treatment: The first stage involves solid removal. In this step, large debris, grit, and other coarse materials are removed from the sewage. Primary treatment typically uses physical processes such as sedimentation and screening. The goal is to reduce the overall volume of solids in the sewage. Secondary Treatment: After primary treatment, the sewage undergoes bacterial decomposition. Biological processes are employed to break down organic matter further. Common secondary treatment methods include the activated sludge process, trickling filters, and oxidation ponds. These processes enhance the removal of organic pollutants and suspended solids. Tertiary Treatment: The last phase of sewage treatment focuses on achieving higher water quality standards. Tertiary treatment includes additional filtration steps to remove impurities. Techniques like microfiltration, ion exchange, and activated carbon adsorption are used to further purify the water. Disinfection (using UV light or chemicals) ensures the elimination of any remaining organic pathogens12. Remember that the specific treatment processes can vary based on the size of the treatment plant, local regulations, and available technology. Overall, sewage treatment plays a vital role in safeguarding our environment and public health! Advantages of the sewage treatment process When deciding on the best wastewater treatment system for your home, you have a choice of either a septic tank or a sewage treatment system. Below are some of the main advantages of choosing a home sewage treatment plant over the traditional septic system. Higher level of treatment A home sewage system puts your wastewater through three different stages to ensure that the end result is a lot cleaner than from a septic tank. In fact, the end result is clean enough that you can water your lawn and garden with it. Can handle higher volumes A HSTP can handle a lot more wastewater than a similar-sized septic tank. Aerobic bacteria can digest wastewater at a much higher level than anaerobic bacteria in a septic system. This means it's better for larger families or households that have occasional parties causing a surge in wastewater. Environmentally friendly Advanced wastewater process protects the delicate balance in the groundwater in the area by releasing water free of harmful pollutants. A well-functioning system is odourless and quiet, further safeguarding air and noise pollution in the area. Saves water and money By reusing the grey (water from showers, baths, sinks, and laundry) and black (water from the toilet) water from your home to water the garden or surrounding landscape you’re saving money and keeping your garden green at the same time. Wastewater treatment is a great water-saving method for dry or drought-affected areas. Self-sufficient A home sewage plant removes the need to pay for often expensive connections to the local sewage network. It also removes your reliance on an external system, meaning if anything goes wrong you can deal with it promptly, you’re not waiting for council repairs. This method of sewage treatment is also ideal for remote areas as the systems can be installed almost anywhere water treatment is needed. Cost-effective to run Once installed and up and running the water treatment process is long-lasting and very cost-effective to operate with low maintenance requirements and minimal power needs. Natural Natural aerobic bacteria are used to help break down the sewage removing many of the pollutants and bacteria. Disease prevention This is especially important in areas at serious risk of disease where sanitation practices are only basic. A wastewater treatment plant can help prevent the spread of disease as the process can kill off harmful organisms which cause diseases such as dysentery, gastroenteritis, and cholera. Reduces ground

pollution In the treatment process, the sewage goes through oxidises. It absorbs the organic matter converting it to carbon dioxide, nitrogen, and water helping to lower the number of pollutants in the .treated wastewater protecting the creeks, lakes and rivers as well as wildlife in the area