




UNIT 5

SEWAGE DISPOSAL



1. WARMING UP

1.1. Tick  which of the following is correct.

- | | | | | |
|--|-------------------------|--------------------------|-------------------|--------------------------|
|  Sewage means | garbage | <input type="checkbox"/> | wastewater | <input type="checkbox"/> |
|  Sewage is disposed of in | treatment plants | <input type="checkbox"/> | dumps | <input type="checkbox"/> |
|  Treated sewage | is re-used | <input type="checkbox"/> | is buried | <input type="checkbox"/> |



2. DEVELOPING LANGUAGE : Processes

Sewage or wastewater results from the waste matter that enters water. It originates mainly from domestic, industrial, groundwater, and meteorological sources, which are known as domestic sewage, industrial waste, infiltration, and storm-water drainage, respectively.

Sewage disposal, or wastewater disposal, means collection, treatment, and sanitary disposal of liquid and water-carried wastes from households and industrial plants.

Wastewater is carried from its source to treatment facility pipe systems. If the system carries both domestic and storm-water sewage, it is called a **combined system**. Such systems are used in the older sections of cities and towns. However, as cities expanded and began to provide treatment of sewage, sanitary sewage was separated from storm sewage to permit flexibility in the operation of the plant and prevent pollution.

Sewage disposal requires various processes. In municipal wastewater treatment plants these processes are known as primary, secondary, or tertiary treatment.

During primary treatment, the wastewater that enters a treatment plant is cleaned from the debris it contains and then passes through a comminutor (grinder), where leaves and other organic materials are reduced in size for efficient treatment and removal later. After that, grit is removed in a grit chamber and the wastewater passes into a sedimentation tank, in which organic materials settle out and are drawn off for disposal.

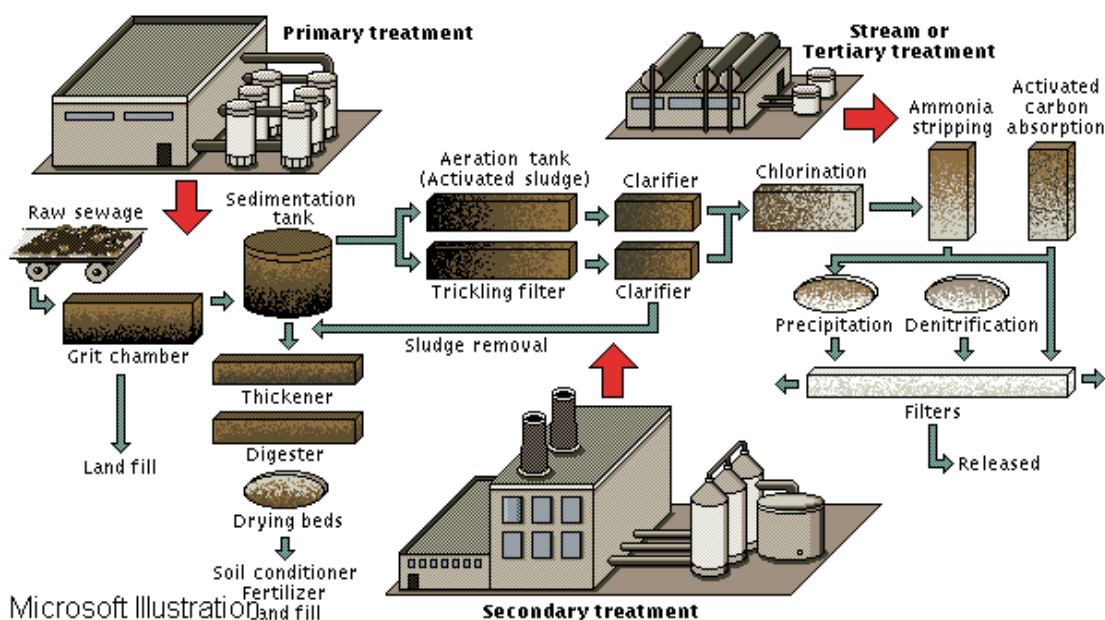


Fig. Wastewater treatment

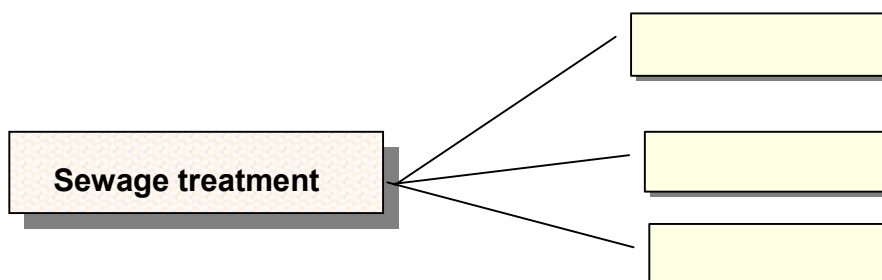
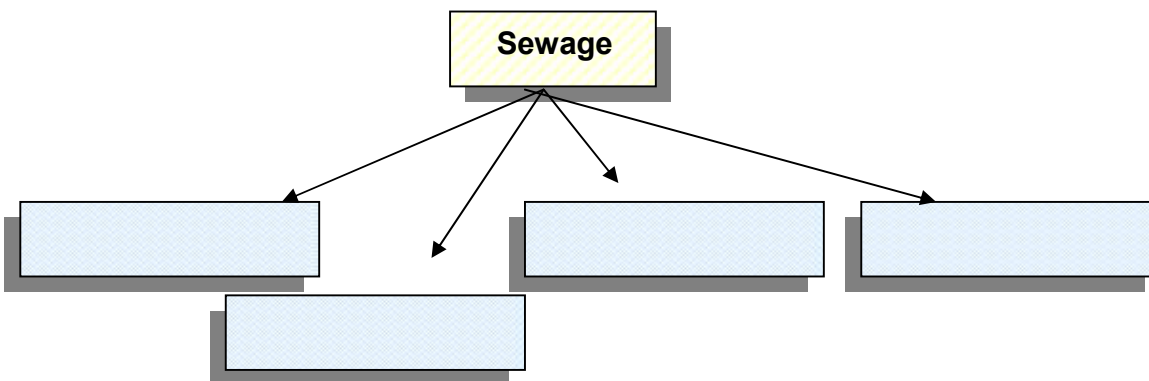
The secondary treatment that follows reduces biologically the organic material that remains in the liquid stream, whereas the third stage, tertiary treatment, is used for removing phosphorus. When the final effluent is intended for re-use advanced wastewater treatment (reverse osmosis, electrodialysis, ozone treatment etc.) is necessary in order to improve effluent quality by removing refractory pollutants.

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3. SCANNING

3.1. Fill in the diagrams below.



4. PRACTISING LANGUAGE

4.1. Fill in the sentences choosing from the words given below, which are synonymous with those in brackets.

treatment
domestic

sanitary
storm-water

removed
originates

grit
municipal

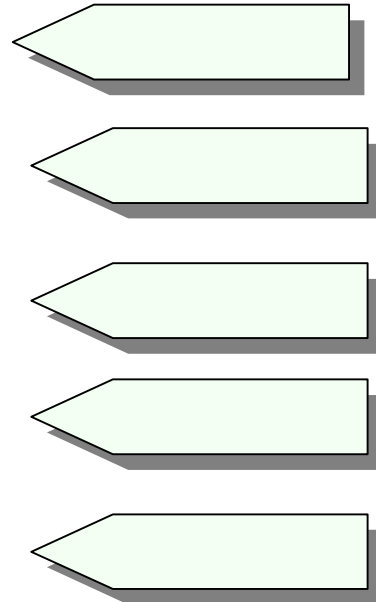
effluent
sewage

1. results from the waste matter that enters water. (wastewater)
2. Sewage from various sources. (comes from)
3. waste are carried through pipes 8-10cm in diameter. (household)

4. Wastewater involves various methods. **(processing)**
5. Sewage disposal is the collection, treatment, anddisposal of water used in households and industrial plants. **(hygienic)**
6. sewage is separated from domestic sewage. **(rain or snow water)**
7. During primary treatment debris is **(taken away)**
8. When is removed, the wastewater passes into a sedimentation tank. **(sand and gravel)**
9. When the is going to be reused, further treatment methods are employed. **(liquid stream)**
10. wastewater treatment plants employ various processes for sewage disposal. **(of a city or town)**

3.2. Identify the type of sewage.

1. car washing water
2. water used for washing bottles in a plant
3. rainfall water
4. water from a steel manufacturing company
5. water collected in sewers below the water table



3.3. Identify the type of treatment in the descriptions below and put them in the right order.

- ☐ grit settles down in a grit chamber
- ☐ phosphorus is removed

- ☐ organic materials settle out in a sedimentation tank
- ☐ debris is removed
- ☐ organic material is reduced biologically



5. EXPANDING LANGUAGE

5.1. Rewrite the processes above linking them with the appropriate linking words (*first*, / *next*, / *after that*, / *finally*).

In wastewater treatment plants sewage treatment involves various processes.

First,

5.2. Rephrase the compound phrases below without changing their meaning.

1. treatment facility pipe system
2. storm water sewage
3. debris mechanical removal
4. narrow channel-shaped tank
5. inorganic particle suspension
6. commonly used methods
7. sedimentation tank
8. refractory pollutant removal

5.3. Fill in the table below with nouns deriving from the words given putting them under the appropriate headings.

	-th	-y	-ion /-tion	-ment	-age
leak					
grow					
discover					
apply					
operate					
generate					
emit					
dispose					
inform					
drain					
collect					
deep					
treat					
develop					
expand					
flexible					
warm					
remove					
improve					
sediment					



6. PRACTISING STRUCTURES

6.1. Complete the sentences with the appropriate time conjunction.

until

before

as soon as

when

while

1. He promised to fix the grit chamber he had the proper parts.
2. I always hear a noise I switch on the power.
3. You can't have experience on the job you work in a power plant.
4. He used to do all the measurements on paper he bought a computer.
5. I looked at the gauges I had checked the debris removal.

6.2. Join the sentences below with time conjunctions (*as, when, as soon as, after, before*).

1. Debris is removed by screens or vertical bars.
The debris is burned or buried.
.....
.....
2. The wastewater passes through a comminutor (grinder).
In the comminutor leaves and other organic materials are reduced in size
.....
.....
3. Grit is removed.
The wastewater passes into a sedimentation tank.
Organic materials settle out and are drawn off for disposal.
.....
.....
4. Air is forced into the wastewater.
The wastewater is discharged into an open tank.
.....
.....

5. The rising air bubbles cause the suspended solids to rise to the surface.

The bubbles are removed.

.....
.....
.....

6.3. Join the sentences below with after or before and make the necessary changes in tenses.

1. First, enzymes dissolved the solid matter.

Then the substance was converted to simple organic acids by a group of acid-producing bacteria.

.....
.....

2. The organic acids were converted to methane and carbon dioxide by bacteria.

After that, thickened sludge was heated.

.....
.....

3. The thickened sludge was heated.

Then it was decomposed.

.....
.....

4. Sewage passed into a sedimentation tank.

Organic materials settled out.

.....
.....

5. Air was forced into the wastewater.

The wastewater entered an open tank.

.....
.....



Glossary

advanced	προηγμένος, σύγχρονος
carry	μεταφέρω, κουβαλώ
chamber	θάλαμος
collection	συλλογή, σωρός
combined	συνδυασμένος
comminutor	συλλέκτης
contain	περιέχω
debris	θραύσματα, συγκέντρωση τεμαχίων βράχου, μπάζα
decompose	αποσυνθέτω
disposal	διάθεση
domestic	οικιακός
drainage	αποχέτευση
draw off	υποχωρώ
efficient	αποδοτικός, αποτελεσματικός, ικανός
effluent	εκρέων, παραπτόταμος
enter	εισάγω, εισέρχομαι
facility	ευκολία, εγκαταστάσεις
flexibility	ευελιξία
follow	ακολουθώ
grinder	συσκευή άλεσης
grit	άμμος, αμμοχάλικο
household	νοικοκυριό
hygienic	υγιεινός
improve	βελτιώνω
industrial	βιομηχανικός
infiltration	διείσδυση, διήθηση, φιλτράρισμα
intend	προτίθεται, σκοπεύω
leaf	φύλλο
liquid	υγρός, υγρό

mainly	κυρίως
matter	ύλη
originate	δημιουργώ, γεννώ, προέρχομαι
permit	επιτρέπω
pipe	σωλήνας
plant	φυτό, εργοστάσιο
prevent	εμποδίζω
primary	βασικός, πρωταρχικός, πρωτοβάθμιος
process	επεξεργάζομαι ειδικά, διαδικασία, μέθοδος (τεχνική-βιομηχανική)
processing	επεξεργασία
reduce	μειώνω, μειώνομαι, περιορίζω, περιορίζομαι
refractory	απρόσβλητος, ανεπηρέαστος, δύστηκτος
remain	παραμένω
removal	αφαίρεση
remove	αφαιρώ
require	απαιτώ
respectively	αντίστοιχα
result from	προκύπτω
re-use	επαναχρησιμοποιώ
reverse	αντίστροφος
sanitary	υγειονομικός, υγιεινός
secondary	δευτερεύων
section	τμήμα, τομέας
sedimentation	ιζηματοποίηση
separate	αποχωρίζω, αποχωρίζομαι, ξεχωριστός, ιδιαίτερος
settle out	εγκαθίσταμαι, κατακάθομαι
sewage	βοθρολύματα
sludge	λάσπη κατεργασμένων αποβλήτων, λασπώδης εναπόθεση
source	πηγή
stage	στάδιο
storm-water drainage	βροχόνερα
stream	ρέμα, ρυάκι, συνεχώς ανανεούμενη τροφοδοσία

tertiary	τριτοβάθμιος, τριτογενής
treatment	μεταχείριση, χρήση, χειρισμός, εκμετάλλευση
various	ποικίλος, διάφορος
waste	απόβλητα, σπαταλώ
wastewater	βοθρολύματα