
TES
STP/ETP
Odour Control

Sewage Treatment Plants (STP), Effluent Treatment Plants (ETP) located near residential or commercial areas, including Apartment building, office buildings etc., can be subject to community frictions and/or legal issues if these facilities produce unpleasant odours.

In the modern world of wastewater treatment and STP, control of odors has moved from an afterthought to a primary design consideration for most collection and treatment facilities. As development encroaches on our facilities and our new neighbors become less tolerant of nuisance odors.

Most odor problems occur in the collection system, in primary treatment facilities and in solids handling facilities.
The following compounds are associated with bad odors: **mercaptans, skatoles, indoles, inorganic acids, aldehydes, ketones and organic compounds containing nitrogen or sulfur atoms.**

These compounds can originate from the anaerobic decomposition of compounds with a high molecular weight, especially proteins. These are recognized as being among the causes of bad-smelling odors at the outlet of sewer lines and in treatment plants in general.

Among the inorganic compounds, **ammonia and hydrogen sulfide are considered to be the main causes of odor when the sewage comes from mainly households**. The presence of hydrogen sulfide is caused by a reducing environment, i.e. characterized by low values of the oxidation-reduction potential.

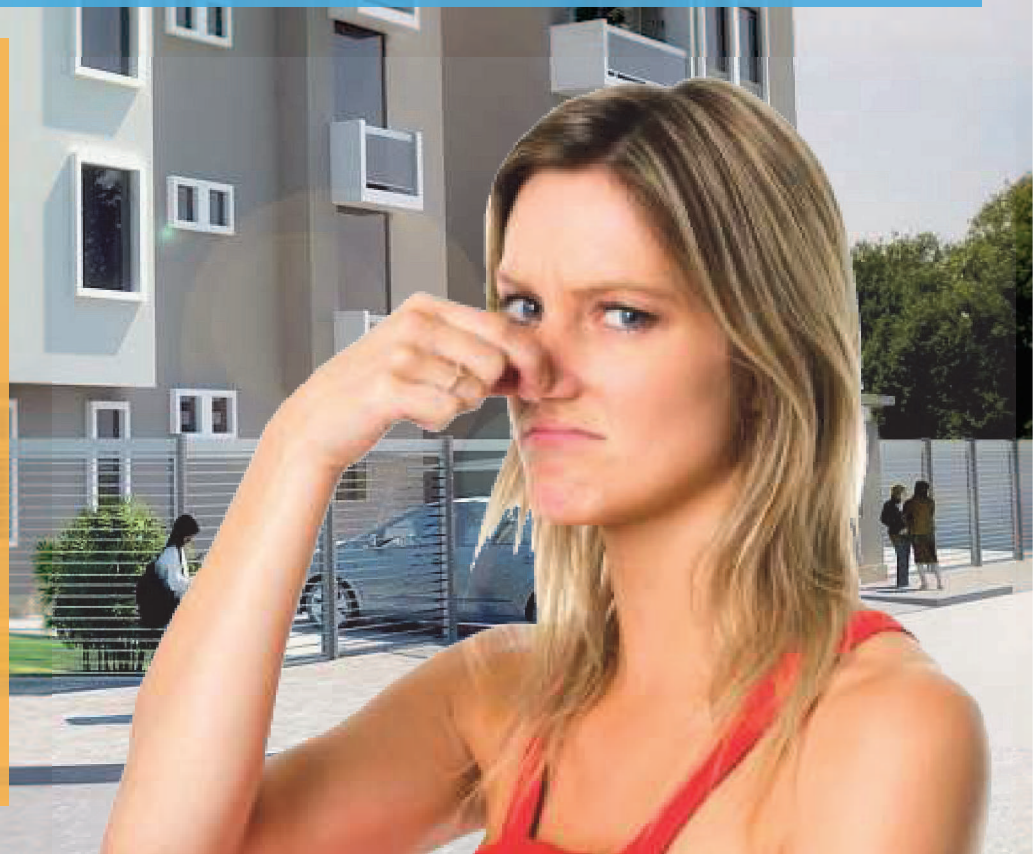
The odors associated with collection systems and primary treatment facilities are generated as a result of an **anaerobic or "septic" condition**. This condition occurs when oxygen transfer to the wastewater is limited. In the anaerobic state, the microbes present in the wastewater have no dissolved oxygen available for respiration. **This allows microbes known as "sulfate-reducing bacteria" to thrive. These bacteria utilize the sulfate ion (SO4-) that is naturally abundant in most waters as an oxygen source for respiration. The by-product of this activity is hydrogen sulfide (H2S)**. This by-product has a low solubility in the wastewater and a strong, offensive, rotten-egg odor.

Solids handling facilities are another significant odor problem area. In biosolids dewatering and treatment processes, the biosolids commonly undergo extreme turbulence, pH adjustment and/or thermal treatment. Depending on the nature of the biosolids stream and the treatment used, the odor compounds released can consist of any combination of the following compounds in a wide range of concentrations: ammonia, **amines, hydrogen sulfide, organic sulfides and mercaptans**. Additionally, anaerobic digestion of sludge creates the anaerobic conditions in which sulfate-reducing bacteria thrive, causing the formation of hydrogen sulfide that is vented with the digester "biogas" formed from the digestion of sludge.

Vapor-phase technologies typically are used in point-source applications such as wastewater treatment plants and pump stations or for the treatment of biogas.

Liquid-phase technologies typically are used in collection systems where control of both odors and corrosion are concerns and/or where multiple point odor control is an objective. Here we provide ozonators of higher capacity for recycling of STP water to be potable and odour free and very good clarity.

Hydrogen Sulphide and Ammonia are two main parameters restricted by regulations:
The concentration of H2S found in the exhaust air of Sewage Treatment Plant is in the range of 5 – 15 ppm. Threshold limit of H2S = 0.002 – 0.15 ppm



The emission level for ammonia is typical in the range of 50 to 150 ppm.
Threshold Limit for NH3 is = 5 ppm

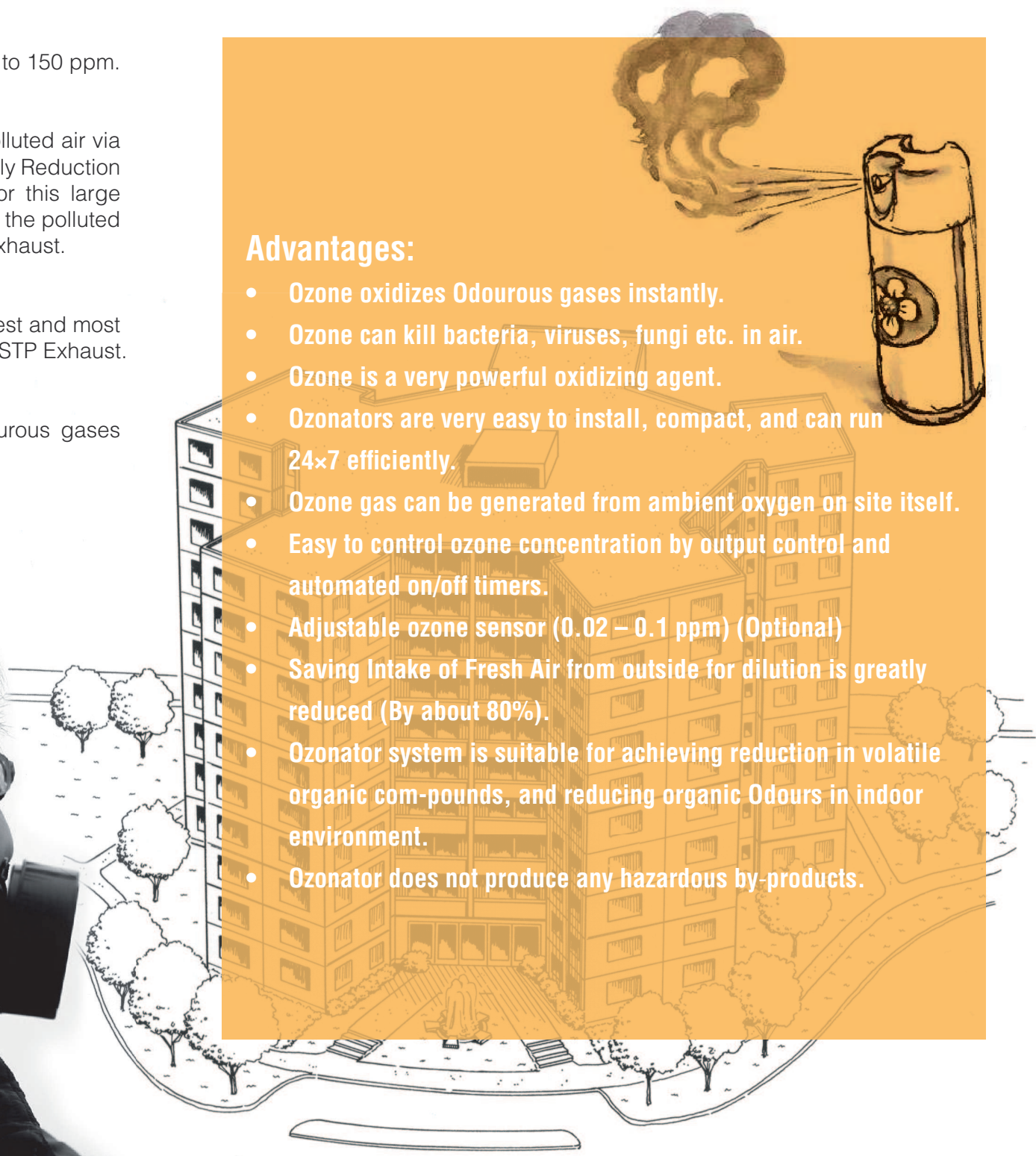
Due to existing limits it is typically required to gather the polluted air via exhaust equipment and to install a treatment system. Normally Reduction of Odourous gas requires the dilution with outside air. For this large capacity of fresh air supply duct is required which will dilute the polluted air. Generally 5 – 7 fresh air changes are required for STP Exhaust.

The integration of Ozone into Air Handling System is the latest and most popular technology to reduce H2S and NH3 from enclosed STP Exhaust.

Role of Ozone:
Ozone is a powerful oxidant which rapidly oxidizes Odourous gases such as Hydrogen sulphide and ammonia.
Ozone Reactivity with Hydrogen sulphide and Ammonia

$H_2S + O_3 \rightarrow SO_2 + H_2O$

$2\,NH_3 + 4\,O_3 \rightarrow NH_4NO_3 + 4\,O_2 + H_2O$.



Advantages:

- Ozone oxidizes Odourous gases instantly.
- Ozone can kill bacteria, viruses, fungi etc. in air.
- Ozone is a very powerful oxidizing agent.
- Ozonators are very easy to install, compact, and can run 24×7 efficiently.
- Ozone gas can be generated from ambient oxygen on site itself.
- Easy to control ozone concentration by output control and automated on/off timers.
- Adjustable ozone sensor (0.02 – 0.1 ppm) (Optional)
- Saving Intake of Fresh Air from outside for dilution is greatly reduced (By about 80%).
- Ozonator system is suitable for achieving reduction in volatile organic com-pounds, and reducing organic Odours in indoor environment.
- Ozonator does not produce any hazardous by-products.

Deliverables of Ozonation System:

- Ozonator is placed in STP Plant room & connected to Exhaust duct line. Ozone will be injected at entry point of exhaust air duct.
- Ozone will be dosed between 1.0 – 2.5 ppm (depending on site conditions).
- Can be wall mounted, light weight.
- The ozone generator system is designed for continuous operation with auto ON/OFF mode.

M2000

M5000

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