

- **Estimating Portable Toilet Counts Based on Event Attendance**

Estimating Portable Toilet Counts Based on Event Attendance Calculating Restroom Needs for Food and Beverage Events Mapping Portable Restroom Locations for Crowd Flow Accessibility Considerations in Event Restroom Placement Weather Factors that Influence Portable Toilet Positioning Portable Restroom Spacing Rules for Outdoor Festivals Integrating Hand Wash Stations with Restroom Layouts Using Technology to Track Portable Toilet Utilization at Events Reducing Line Times with Optimal Restroom Distribution Setup Timeline for Event Portable Restroom Delivery Coordination with Other Vendors During Restroom Placement Post Event Evaluation of Portable Toilet Placement Effectiveness

- **Measuring the Carbon Footprint of Portable Restrooms**

Measuring the Carbon Footprint of Portable Restrooms Benefits of Formaldehyde Free Deodorizer Solutions Recycling High Density Polyethylene from Retired Units Water Conservation Strategies in Portable Toilet Design Certification Pathways for Green Portable Sanitation Lifecycle Analysis of Standard and Deluxe Portable Toilets Partnering with Wastewater Plants for Sustainable Disposal Implementing Solar Lighting in Portable Restrooms Composting Options for Biodegradable Portable Toilet Waste Communicating Sustainability Initiatives to Event Organizers Selecting Vendors with ISO Environmental Management Systems Tracking Emission Reductions through Fleet Optimization

- **About Us**



In the ever-evolving landscape of waste management, the recycling of retired porta potty units presents a unique opportunity to contribute to sustainability and environmental stewardship. These portable sanitation facilities, commonly used at construction sites, festivals, and outdoor events, are predominantly made from High Density Polyethylene (HDPE), a material known for its durability and resistance to various environmental conditions. Agricultural events like Virginia's county fairs require significant portable restroom infrastructure to serve large rural crowds **fancy porta potty rental** Hygiene. As these units reach the end of their service life, the process of their collection and segregation becomes crucial for the successful recycling of HDPE.

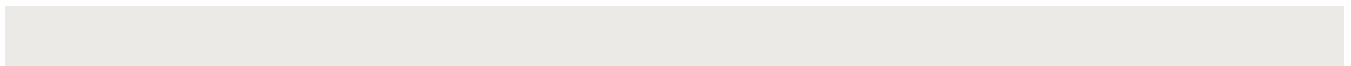
The first step in this process involves the collection of retired porta potty units. This task requires a systematic approach to ensure that these units are retrieved efficiently

and safely. Partnerships with waste management companies, event organizers, and construction firms can facilitate the collection process. These units need to be transported to designated facilities where they can be processed further. It is essential that the transportation is conducted in a manner that minimizes environmental impact, adhering to regulations and best practices in waste handling.

Once the units are collected, the next step is the segregation of HDPE from other materials. Porta potties are complex structures, often containing a mix of plastics, metals, and other materials. Segregating HDPE from these components is vital for the recycling process. Advanced sorting technologies, such as automated optical sorters and manual sorting stations, can be employed to separate HDPE from other materials. This step is crucial as it ensures that the HDPE is pure and free from contaminants, which can affect the quality of the recycled material.

Recycling HDPE from retired porta potty units offers several environmental benefits. Firstly, it reduces the demand for virgin HDPE, thereby conserving natural resources and reducing the carbon footprint associated with the production of new plastic. Secondly, recycling HDPE helps in diverting waste from landfills, thereby reducing the environmental impact of waste disposal. Moreover, the recycled HDPE can be used to manufacture new products, creating a circular economy and promoting sustainability.

In conclusion, the collection and segregation of retired porta potty units for recycling HDPE is a vital process in the realm of waste management. By ensuring that these units are collected efficiently and that HDPE is properly segregated, we can contribute to a more sustainable future. This process not only helps in conserving resources and reducing environmental impact but also paves the way for innovative recycling practices that benefit both the environment and the economy.



Recycling High Density Polyethylene (HDPE) from retired units is a crucial step in the sustainable management of plastic waste. Before the HDPE can be effectively recycled, it must undergo a series of pre-treatment and cleaning processes to ensure that it is free from contaminants and suitable for reuse. This essay explores the importance of these processes and the methods employed to achieve optimal results.

First and foremost, the pre-treatment phase is essential in preparing the HDPE for recycling. This involves the collection and sorting of retired units, which may include plastic containers, pipes, and other items made from HDPE. Proper sorting is vital to separate HDPE from other types of plastics and materials, as contamination can significantly reduce the quality of the recycled product. Once sorted, the HDPE is typically shredded into smaller pieces, making it easier to handle and process further.

Cleaning is another critical step in the recycling process. HDPE can accumulate various contaminants during its lifecycle, such as food residues, labels, adhesives, and other foreign materials. These contaminants must be removed to ensure that the recycled HDPE meets the necessary standards for reuse. Cleaning can be achieved through several methods, including washing with water, using detergents, and employing mechanical processes like air classification and magnetic separation to remove metal particles.

In some cases, additional treatments may be required to enhance the quality of the recycled HDPE. For instance, additives can be used to improve the material's properties, such as its strength, durability, and resistance to heat and chemicals. These additives are carefully selected to ensure they do not compromise the environmental benefits of recycling.

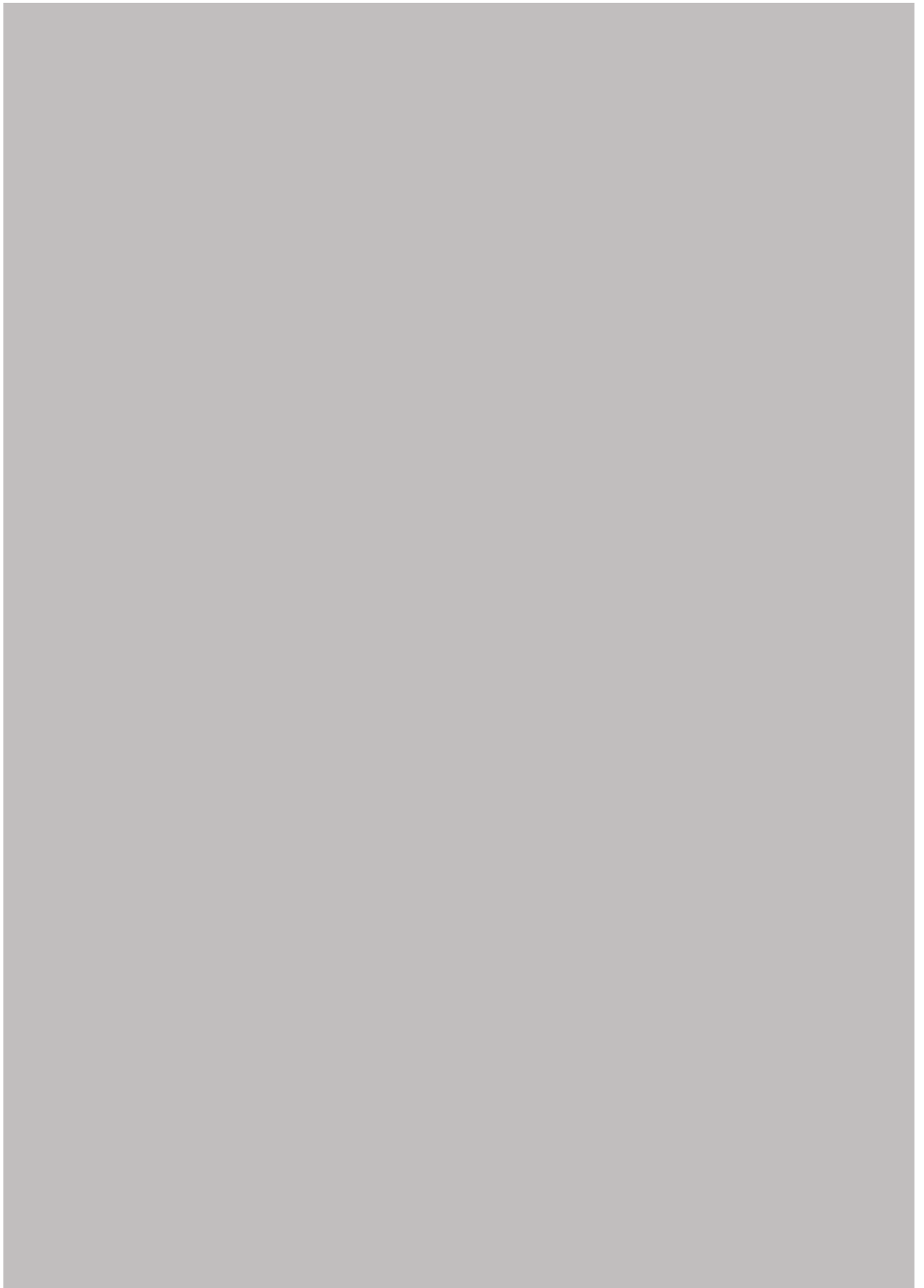
Overall, the pre-treatment and cleaning processes for recycling HDPE are integral to the success of the recycling program. By ensuring that the HDPE is clean, free from contaminants, and properly prepared, these processes help to maintain the integrity of

the recycled material and support the broader goal of reducing plastic waste. As the demand for sustainable practices continues to grow, the importance of these processes will only increase, highlighting the need for ongoing innovation and improvement in recycling technologies.

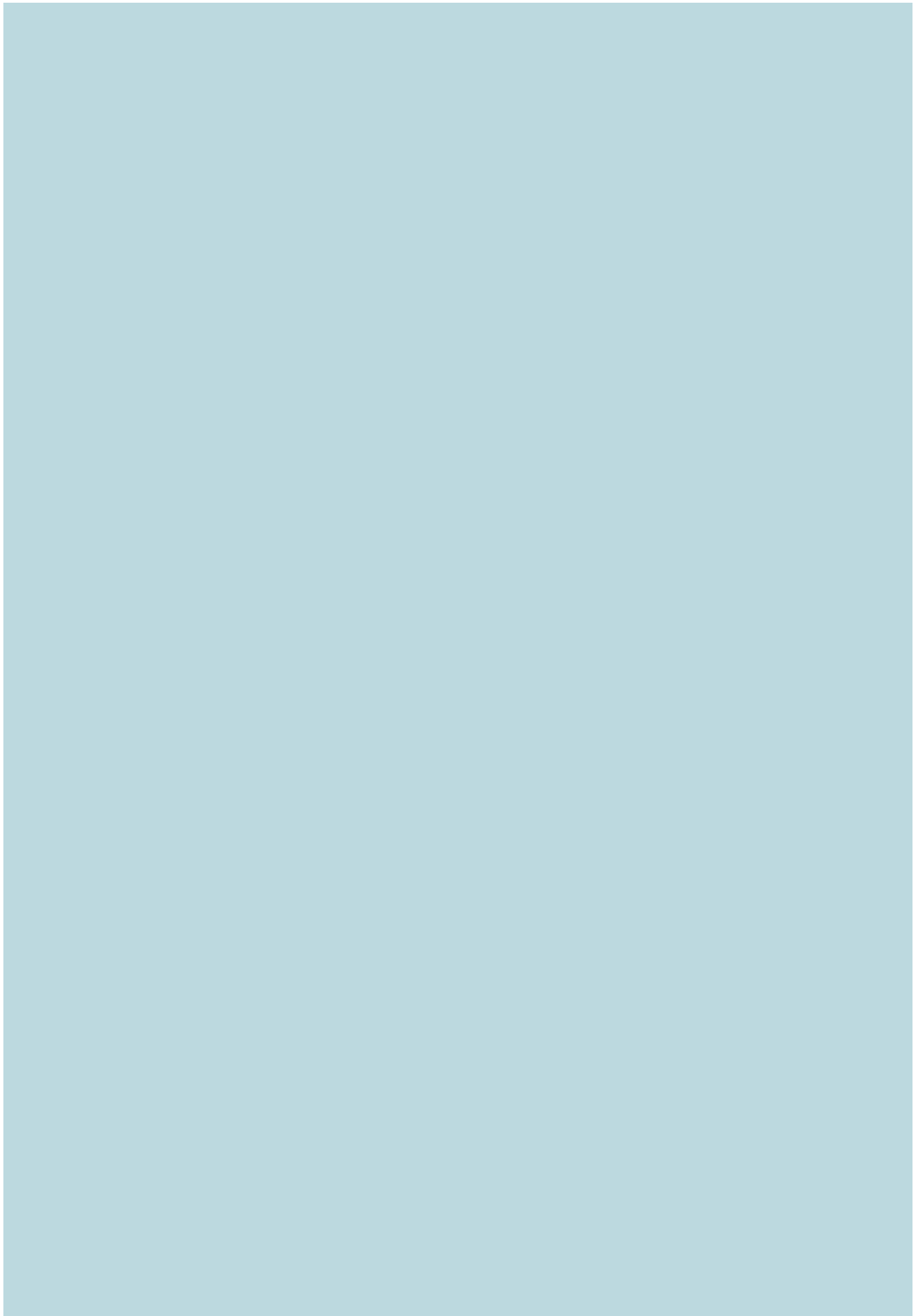
restroom rentals virginia

Social Signals:

Clear Restroom Social Signal:



How to reach us:



Duration of the Event and Toilet Needs

Recycling High Density Polyethylene (HDPE) from retired units, like those sturdy milk jugs or detergent bottles we've all got, is a crucial piece of the sustainability puzzle. Its not just about tossing them in the blue bin and hoping for the best. Theres actually a whole range of techniques involved, each with its own strengths and weaknesses.

The most common approach is mechanical recycling. Think of it as the workhorse of HDPE recycling. It starts with sorting, separating the HDPE from other plastics and contaminants. Then comes shredding and washing to get rid of labels, dirt, and leftover gunk. The shredded material is melted down and reformed into new products. It's relatively straightforward and energy-efficient, making it a popular choice. However, with each cycle of melting and reshaping, the HDPE can degrade a little, impacting its strength and flexibility. That's why mechanically recycled HDPE is often blended with virgin plastic to maintain quality.

Then theres chemical recycling, a more advanced (and often more expensive) method. Instead of just melting the plastic, chemical recycling breaks down the HDPE into its basic building blocks – monomers and oligomers. These can then be used to create entirely new plastics, essentially resetting the clock on degradation. This is particularly useful for dealing with contaminated or mixed plastic waste that mechanical recycling cant handle effectively. While promising, chemical recycling is still developing and faces challenges in

terms of energy consumption and economic viability.

Finally, there's energy recovery, which involves incinerating the HDPE to generate electricity or heat. While it sounds like a last resort, it can be a better option than landfilling, especially when dealing with heavily contaminated plastic. However, it's important to implement proper emission controls to minimize air pollution.

The best approach really depends on the specific circumstances – the quality of the collected HDPE, the available technology, and the desired end product. A combination of these techniques is often the most effective strategy for maximizing the value of retired HDPE units and minimizing their environmental impact. It's a complex process, but absolutely vital for a more circular economy.



Special Considerations for Different Event Types

The utilization of recycled materials in new products is a crucial step towards a more sustainable and environmentally friendly future. Recycling high-density polyethylene (HDPE) from retired units is a prime example of how this practice can be effectively implemented. HDPE is a versatile and durable plastic commonly used in various applications, including packaging, containers, and even some automotive parts. When these items reach the end of their useful life, they can be collected, processed, and transformed into new products, thereby reducing the demand for virgin materials and minimizing waste.

Recycling HDPE from retired units not only conserves resources but also helps to mitigate the environmental impact associated with plastic production and disposal. By converting waste materials into valuable resources, we can create a circular economy where products are designed with their end-of-life in mind, and materials are kept in use for as long as possible. This approach aligns with the principles of sustainable development, which emphasize the importance of balancing economic growth, social equity, and environmental protection.

One of the key benefits of utilizing recycled HDPE in new products is the potential for energy savings. The production of recycled HDPE typically requires less energy than producing virgin HDPE, which can lead to a reduction in greenhouse gas emissions and a smaller carbon footprint. Additionally, recycling HDPE can help to reduce the amount of waste that ends up in landfills, where it can take hundreds of years to decompose and may release harmful chemicals into the environment.

Moreover, the use of recycled HDPE in new products can also contribute to innovation and the development of new applications. As the demand for sustainable materials grows, manufacturers and designers are increasingly exploring ways to incorporate recycled content into their products. This has led to the creation of a wide range of innovative items, from recycled HDPE furniture and flooring to recycled HDPE clothing and

accessories. These new products not only demonstrate the potential of recycled materials but also help to raise awareness about the importance of recycling and the value of sustainable practices.

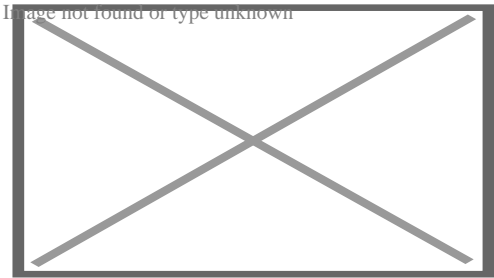
In conclusion, the utilization of recycled materials in new products, such as recycling high-density polyethylene from retired units, is a vital component of a sustainable future. By embracing this practice, we can reduce our reliance on virgin materials, minimize waste, and contribute to a more circular economy. Furthermore, the use of recycled HDPE in new products can drive innovation, promote energy savings, and help to protect our environment for future generations.

About Wastewater

Not to be confused with Wastewater.

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Part of a series on



Air pollution from a factory

Air

- Acid rain
- Air quality index
- Atmospheric dispersion modeling
- Chlorofluorocarbon
- Combustion
- Exhaust gas
- Haze
- Household air pollution
- Global dimming
- Global distillation
- Indoor air quality
- Non-exhaust emissions
- Ozone depletion
- Particulates
- Persistent organic pollutant
- Smog
- Soot
- Volatile organic compound

Biological

- Biological hazard
- Genetic
- Illegal logging
- Introduced species
 - Invasive species

Digital

- Information

Electromagnetic

- Light
 - Ecological
 - Overillumination
- Radio spectrum

Natural

- Ozone
- Radium and radon in the environment
- Volcanic ash
- Wildfire

Noise

- Transportation
- Health effects from noise
- Marine mammals and sonar
- Noise barrier
- Noise control
- Soundproofing

Radiation

- Actinides
- Bioremediation
- Depleted uranium
- Nuclear fission
- Nuclear fallout
- Plutonium
- Poisoning
- Radioactivity
- Uranium
- Radioactive waste

Soil

- Agricultural
- Land degradation
- Bioremediation
- Defecation
- Electrical resistance heating
- Illegal mining
- Soil guideline values
- Phytoremediation

Solid waste

- Advertising mail
- Biodegradable waste
- Brown waste
- Electronic waste
- Food waste
- Green waste
- Hazardous waste
- Industrial waste
- Litter
- Mining
- Municipal solid waste
- Nanomaterials
- Plastic
- Packaging waste
- Post-consumer waste
- Waste management

Space

- Space debris

Visual

- Air travel
- Advertising clutter
- Overhead power lines
- Traffic signs
- Urban blight
- Vandalism

War

- Chemical warfare
- Herbicidal warfare
 - Agent Orange
- Nuclear holocaust
 - Nuclear fallout
 - Nuclear famine
 - Nuclear winter
- Scorched earth
- Unexploded ordnance
- War and environmental law

Water

- Agricultural wastewater
- Biosolids
- Diseases
- Eutrophication
- Firewater
- Freshwater
- Groundwater
- Hypoxia
- Industrial wastewater
- Marine
- Monitoring
- Nonpoint source
- Nutrient
- Ocean acidification
- Oil spill
- Pharmaceuticals
- Freshwater salinization
- Septic tanks
- Sewage
- Shipping
- Sludge
- Stagnation
- Sulfur water
- Surface runoff
- Turbidity
- Urban runoff
- Water quality
- Wastewater

Topics

- History
- Pollutants
 - Heavy metals
 - Paint

Misc

- Area source
- Brain health and pollution
- Debris
- Dust
- Garbology
- Legacy
- Thermal pollution
- Midden
- Point source
- Waste
 - Toxic

Lists

- Diseases
- Law by country
- Most polluted cities
- Least polluted cities by PM2.5
- Treaties
- Most polluted rivers

Categories

- By country

○  Environment portal

○  Ecology portal

Wastewater (or **waste water**) is water generated after the use of freshwater, raw water, drinking water or saline water in a variety of deliberate applications or processes.^[1] Another definition of wastewater is "Used water from any combination of domestic, industrial, commercial or agricultural activities, surface runoff / storm water, and any sewer inflow or sewer infiltration".^[2] everyday usage, wastewater is commonly a synonym for sewage (also called domestic wastewater or municipal wastewater), which is wastewater that is produced by a community of people.

As a generic term, wastewater may also describe water containing contaminants accumulated in other settings, such as:

- Industrial wastewater: waterborne waste generated from a variety of industrial processes, such as manufacturing operations, mineral extraction, power generation, or water and wastewater treatment.
- Cooling water, is released with potential thermal pollution after use to condense steam or reduce machinery temperatures by conduction or evaporation.
- Leachate: precipitation containing pollutants dissolved while percolating through ores, raw materials, products, or solid waste.
- Return flow: the flow of water carrying suspended soil, pesticide residues, or dissolved minerals and nutrients from irrigated cropland.
- Surface runoff: the flow of water occurring on the ground surface when excess rainwater, stormwater, meltwater, or other sources, can no longer sufficiently rapidly infiltrate the soil.
- Urban runoff, including water used for outdoor cleaning activity and landscape irrigation in densely populated areas created by urbanization.
- Agricultural wastewater: animal husbandry wastewater generated from confined animal operations.

References

[edit]

1. ^ Tchobanoglous, George; Burton, Franklin L.; Stensel, H. David; Metcalf & Eddy (2003). *Wastewater engineering : treatment and reuse* (4th ed.). Boston: McGraw-

Hill. ISBN 0-07-041878-0. OCLC 48053912.

2. ^ Tilley, E.; Ulrich, L.; Lüthi, C.; Reymond, Ph.; Zurbrügg, C. (2014). *Compendium of Sanitation Systems and Technologies – (2nd Revised ed.)*. Swiss Federal Institute of Aquatic Science and Technology (Eawag), Duebendorf, Switzerland. ISBN 978-3-906484-57-0. Archived from the original on 8 April 2016.

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Wastewater

Sources and types

- Acid mine drainage
- Ballast water
- Bathroom
- Blackwater (coal)
- Blackwater (waste)
- Boiler blowdown
- Brine
- Combined sewer
- Cooling tower
- Cooling water
- Fecal sludge
- Greywater
- Infiltration/Inflow
- Industrial wastewater
- Ion exchange
- Leachate
- Manure
- Papermaking
- Produced water
- Return flow
- Reverse osmosis
- Sanitary sewer
- Septage
- Sewage
- Sewage sludge
- Toilet
- Urban runoff

Quality indicators

- Adsorbable organic halides
- Biochemical oxygen demand
- Chemical oxygen demand
- Coliform index
- Oxygen saturation
- Heavy metals
- pH
- Salinity
- Temperature
- Total dissolved solids
- Total suspended solids
- Turbidity
- Wastewater surveillance

Treatment options

- Activated sludge
- Aerated lagoon
- Agricultural wastewater treatment
- API oil–water separator
- Carbon filtering
- Chlorination
- Clarifier
- Constructed wetland
- Decentralized wastewater system
- Extended aeration
- Facultative lagoon
- Fecal sludge management
- Filtration
- Imhoff tank
- Industrial wastewater treatment
- Ion exchange
- Membrane bioreactor
- Reverse osmosis
- Rotating biological contactor
- Secondary treatment
- Sedimentation
- Septic tank
- Settling basin
- Sewage sludge treatment
- Sewage treatment
- Sewer mining
- Stabilization pond
- Trickling filter
- Ultraviolet germicidal irradiation
- UASB
- Vermifilter
- Wastewater treatment plant

Disposal options

- Combined sewer
- Evaporation pond
- Groundwater recharge
- Infiltration basin
- Injection well
- Irrigation
- Marine dumping
- Marine outfall
- Reclaimed water
- Sanitary sewer
- Septic drain field
- Sewage farm
- Storm drain
- Surface runoff
- Vacuum sewer

-  Category: Sewerage

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Pollution

History

Air

- Acid rain
- Air quality index
- Air pollution measurement
- Atmospheric dispersion modeling
- Chlorofluorocarbon
- Combustion
 - Biofuel
 - Biomass
 - Coal
 - Joss paper
 - Open burning of waste
- Construction
 - Renovation
- Demolition
- Exhaust gas
 - Diesel exhaust
- Haze
 - Smoke
- Indoor air quality
- Internal combustion engine
- Global dimming
- Global distillation
- Mining
- Ozone depletion
- Particulates
 - Asbestos
 - Oil refining
 - Polluting cooking fuels
- Persistent organic pollutant
- Smelting
- Smog
- Soot
 - Black carbon
- Volatile organic compound
- Waste

Biological

- Biological hazard
- Genetic pollution
- Introduced species
 - Invasive species

Digital

- Information pollution

Electromagnetic

- Light
 - Ecological light pollution
 - Overillumination

Natural

- Radio spectrum pollution
- Ozone
- Radium and radon in the environment
- Volcanic ash
- Wildfire
- Transportation
 - Land
 - Water
 - Air
 - Rail
 - Sustainable transport

Noise

- Urban
- Sonar
 - Marine mammals and sonar
- Industrial
- Military
- Abstract
- Noise control

Radiation

- Actinides
- Bioremediation
- Nuclear fission
- Nuclear fallout
- Plutonium
- Poisoning
- Radioactivity
- Uranium
- Electromagnetic radiation and health
- Radioactive waste
- Agricultural pollution
 - Herbicides
 - Manure waste
 - Pesticides

Soil

- Land degradation
- Bioremediation
- Open defecation
- Electrical resistance heating
- Soil guideline values
- Phytoremediation

Solid waste

- Advertising mail
- Biodegradable waste
- Brown waste
- Electronic waste
 - Battery recycling
- Foam food container
- Food waste
- Green waste
- Hazardous waste
 - Biomedical waste
 - Chemical waste
 - Construction waste
 - Lead poisoning
 - Mercury poisoning
 - Toxic waste
- Industrial waste
 - Lead smelting
- Litter
- Mining
 - Coal mining
 - Gold mining
 - Surface mining
 - Deep sea mining
 - Mining waste
 - Uranium mining
- Municipal solid waste
 - Garbage
- Nanomaterials
- Plastic pollution
 - Microplastics
- Packaging waste
- Post-consumer waste
- Waste management
 - Landfill
 - Thermal treatment

Space

- Satellite
- Air travel
- Clutter (advertising)

Visual







- Traffic signs
- Overhead power lines
- Vandalism

War

- Chemical warfare
- Herbicidal warfare (Agent Orange)
- Nuclear holocaust (Nuclear fallout – nuclear famine – nuclear winter)
- Scorched earth
- Unexploded ordnance
- War and environmental law

Water

- Agricultural wastewater
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- Diseases
- Eutrophication
- Firewater
- Freshwater
- Groundwater
- Hypoxia
- Industrial wastewater
- Marine
 - debris
- Monitoring
- Nonpoint source pollution
- Nutrient pollution
- Ocean acidification
- Oil exploitation
- Oil exploration
- Oil spill
- Pharmaceuticals
- Sewage
 - Septic tanks
 - Pit latrine
- Shipping
- Stagnation
- Sulfur water
- Surface runoff
- Thermal
- Turbidity
- Urban runoff
- Water quality

<p>Topics</p>	<ul style="list-style-type: none"> ○ Pollutants <ul style="list-style-type: none"> ○ Heavy metals ○ Paint ○ Brain health and pollution ○ Area source ○ Debris ○ Dust
<p>Misc</p>	<ul style="list-style-type: none"> ○ Garbology ○ Legacy pollution ○ Midden ○ Point source ○ Waste ○ Cleaner production ○ Industrial ecology ○ Pollution haven hypothesis
<p>Responses</p>	<ul style="list-style-type: none"> ○ Pollutant release and transfer register ○ Polluter pays principle ○ Pollution control ○ Waste minimisation ○ Zero waste ○ Diseases ○ Law by country
<p>Lists</p>	<ul style="list-style-type: none"> ○ Most polluted cities ○ Least polluted cities by PM_{2.5} ○ Most polluted countries ○ Most polluted rivers ○ Treaties
<div> <div>  Categories (by country) </div> <div>  Commons </div> <div>  WikiProject Environment </div> <div>  WikiProject Ecology </div> <div>  Environment portal </div> <div>  Ecology portal </div> </div>	

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Plumbing

**Fundamental
concepts**

- Air gap (plumbing)
- Backflow
- Compatibility (chemical)
- Corrosion
- Drain (plumbing)
- Drinking water
- Fuel gas
- Friction loss
- Grade (slope)
- Greywater
- Heat trap
- Hydrostatic loop
- Leak
- Neutral axis
- Onsite sewage facility
- Pressure
- Sanitary sewer
- Sewer gas
- Sewage
- Sewerage
- Siphon
- Storm sewer
- Stormwater
- Surface tension
- Tap water
- Thermal expansion
- Thermal insulation
- Thermosiphon
- Trap (plumbing)
- Venturi effect
- Wastewater
- Water hammer
- Water supply network
- Water table
- Well

- Brazing
- British Standard Pipe (BSP)
- Cast iron pipe
- Chemical drain cleaners
- Compression fitting
- Copper tubing
- Crimp (joining)
- Drain–waste–vent system
- Ductile iron pipe
- Flare fitting
- Garden Hose Thread (GHT)
- Gasket
- Hydronics
- Leak detection
- National pipe thread (NPT)
- Nominal Pipe Size (NPS)

Technology

- O-ring
- Oakum
- Pipe (fluid conveyance)
- Pipe dope
- Pipe support
- Plastic pipework
- Push-to-pull compression fittings
- Putty
- Sealant
- Sewage pumping
- Soldering
- Solvent welding
- Swaging
- Thread seal tape
- Threaded pipe
- Tube bending
- Water heat recycling

- Atmospheric vacuum breaker
- Automatic bleeding valve
- Automatic faucet
- Backflow prevention device
- Ball valve
- Bleed screw
- Booster pump
- Butterfly valve
- Check valve
- Chemigation valve
- Chopper pump
- Circulator pump
- Cistern
- Closet flange
- Concentric reducer
- Condensate pump
- Coupling (piping)
- Diaphragm valve
- Dielectric union
- Double check valve
- Eccentric reducer
- Expansion tank
- Faucet aerator
- Float switch
- Float valve
- Floor drain
- Flow limiter
- Flushing trough
- Flushometer
- Gate valve
- Globe valve
- Grease trap
- Grinder pump
- Hose coupling
- Manifold

Components

**Plumbing
fixtures**

- Accessible bathtub
- Bathtub
- Bidet
- Dehumidifier
- Dishwasher
- Drinking fountain
- Electric water boiler
- Evaporative cooler
- Flush toilet
- Garbage disposal unit
- Hot water storage tank
- Humidifier
- Icemaker
- Instant hot water dispenser
- Laundry tub
- Shower
 - water recycling shower
- Sink
- Storage water heater
- Sump pump
- Tankless water heating
- Urinal
- Washing machine
- Washlet
- Water dispenser
- Water filter
- Water heating
- Water softening

**Specialized
tools**

- Basin wrench
- Blowtorch
- Borescope
- Core drill
- Drain cleaner
- Driving cap
- Flare-nut wrench
- Pipecutter
- Pipe wrench
- Plumber's snake
- Plumber wrench
- Plunger
- Strap wrench
- Tap and die
- Control valve

**Measurement
and control**

- Flow sensor
- Pressure sensor
- Water detector
- Water metering
- Hydronic balancing
- Hydrostatic testing

**Professions,
trades,
and services**

- Leak detection
- Mechanical, electrical, and plumbing
- Pipe marking
- Pipefitter
- Pipelayer
- Plumber

Industry organizations and standards	<ul style="list-style-type: none"> ◦ International Association of Plumbing and Mechanical Officials (IAPMO) ◦ NSF International ◦ Plumbing & Drainage Institute (PDI) ◦ Uniform Plumbing Code (UPC) ◦ World Plumbing Council (WPC)
Health and safety	<ul style="list-style-type: none"> ◦ Plumbing code ◦ Scalding ◦ Waterborne disease ◦ Fire sprinkler system ◦ Piping ◦ Template:HVAC
See also	<ul style="list-style-type: none"> ◦ Template:Public health ◦ Template:Sewerage ◦ Template:Human waste elimination ◦ Template:Wastewater

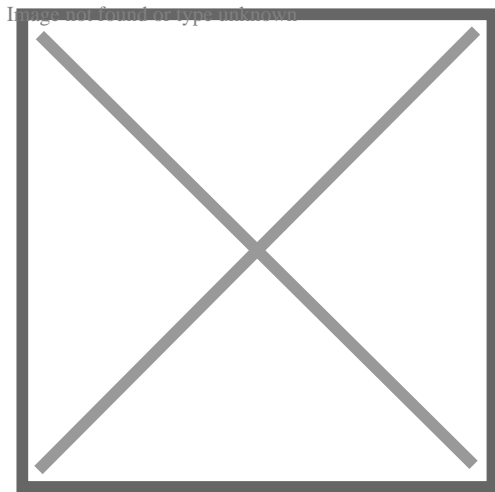
Disambiguation icon

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This set index article includes a list of related items that share the same name (or similar names).

If an internal link incorrectly led you here, you may wish to change the link to point directly to the intended article.

About Soap dispenser



A **soap dispenser** is a device that, when manipulated or triggered appropriately, dispenses soap (usually in small, single-use quantities). Soap dispensers typically dispense liquid soap or foam soap. They can be automatic or manually operated by a handle and are often found in public toilets or private bathrooms.

Manual

[edit]

The design of a manual soap dispenser is generally determined by whether the soap comes in liquid, powder or foam form.

Liquid soap

[edit]

When soap is dispensed in liquid form, it is generally in a squeeze bottle or pump. The most popular soap dispensers of this type are plastic pump bottles, many of which are disposable.

William Quick patented liquid soap on August 22, 1865. Minnetonka Corporation introduced the first modern liquid soap in 1980 and bought up the entire supply of plastic pumps used in their dispensers to delay competition entering the market.^[1]

Parts

[edit]

- Actuator – This is the top of the pump from which is pressed down to get the liquid out
- Closure – Closure is the bottle that is fastened to the bottle's neck. it has a smooth or ribbed surface
- Outer gasket – Made up of plastic or rubber, it is fit inside the closure and prevents leakage
- Housing – The main pump that keeps the other components in the right place and sends liquid to the actuator from the dip tube
- Dip tube – This is the visible tube that carries liquid from the bottom of the bottle up to the housing
- Interior components – A spring, ball, piston or stem that helps move the liquid to the actuator

Operation

[edit]

The handwash bottle acts much like an air suction device that draws liquid upwards to the user's hands against the force of gravity. When the user presses down the actuator, the piston compresses the spring and upward air pressure pulls the ball upward, along with the liquid product into the dip tube and then reaches the housing. When the user releases the actuator, the spring returns the piston and actuator to the normal position and the ball returns to its earlier position to stop the backflow of the liquid back to the bottle. This process is called 'priming' and is only used when the handwash is put in the bottle.

When the user presses the bottle again, the liquid in the housing is drawn from there and is released out of the actuator. The housing is again filled up with the handwash from the bottle, and the process goes on.

Dry soap

[edit]

A vertical stainless steel tube, mounted on a wall, with a crank handle on the side at the bottom

Image not found or type unknown

A soap mill in a public washroom.

A moulded bulge protruding from the underside of a moulded plastic surface; at the base of the

Image not found or type unknown

A train-washroom built-in soap mill from below.

When the black spokes are rotated with one finger, the spiral blades rotate against the soap bar visible behind them and flakes of soap fall out the bottom of the device into the other hand.

Some soap dispensers grate, plane^[2] or grind solid soap bars to flakes or powder as they are dispensed. About 40 grams (1.4 oz) fresh weight of soap is equivalent to 1 liter (0.22 imp gal; 0.26 U.S. gal) of liquid soap, providing soap for up to 400 handwashings.

Soap mills are common in public washrooms in Germany.^[3] **Soap graters** made specifically for home use^[4]^[2] can be wall-mounted or free-standing (like a pepper grinder) and waterproof for use in a shower.^[5]^[6] Some graters take specially dimensioned soap bars, others will take a range of ordinary soap bar sizes.^[3]^[2]

Dispensers of pre-powdered soaps, such as borax, often take the form of a metal box with a weighted lever; when the lever is pressed, a handful of soap is released. Ground soap is also used to wash laundry.^[7]

Foam soap

[edit]

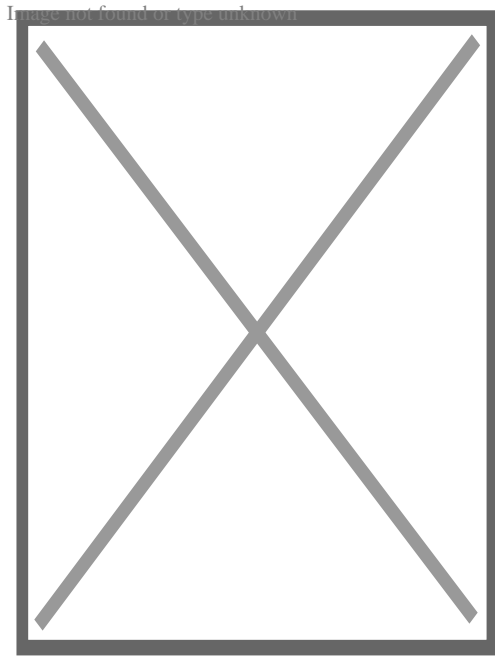
Foam soap dispensers have dual foam pumps that when used, move both air and soap, injecting both together through small openings to create a lather. They can be found in both manual and automatic varieties.

Manual dispensers of foam soap often consist of a large button that squeezes the foam out of a tube. Many liquid soap dispensers operate in this way as well. A few dispensers operate with a lever that pulls forward and squeezes the soap out.

The majority of manual foam soap dispensers have the soap in a bladder in the dispenser in liquid form, as the pump is pressed the liquid soap is pushed through a small foaming nozzle which foams the soap.

Automatic

[edit]



Automatic soap dispenser

Main article: Automatic soap dispenser

An automatic soap dispenser is specifically a hands-free dispenser of liquid or foam soap, and generally can be used for other liquids such as hand sanitizers, shampoos or hand lotions. They are often battery-powered. Hands-free dispensers for water and soap/hand sanitizer have particular virtues for operating theatres and treatment rooms.

Mechanism

[edit]

The touch-free design dispenses the liquid when a sensor detects motion under the nozzle. The electronic components of an automatic soap dispenser allow for a timing device or signal (sound, lights, etc.) which can indicate to the user whether they have washed their hands for the correct amount of time or not.

See also

[edit]

- Foam pump

- Hand washing
- Soapdish

References

[edit]

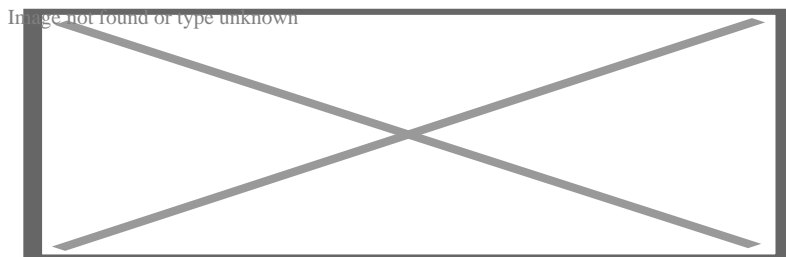
1. ^ *"The History of Soap and Detergent". Archived from the original on July 14, 2012.*
2. ^ **a b c** *"Trockenseifenspender SoapPlaner". SoapPlaner (in German).*
3. ^ **a b** *Morwood, Peter. "Trockenseifenspender (dry soap dispenser)".*
4. ^ *John Brownlee (12 January 2011). "Bar soap dispenser will double as cheese grater in a pinch". Geek.com.*
5. ^ *"Soap Grater Looks Practical". Cool Things. January 11, 2011.*
6. ^ *"Soap Flakes - Soap Bar Dispensers". The Green Head - Finds Cool New Stuff!.*
7. ^ *"How To Make Classic DIY Laundry Detergent With NO Grating!". Farming My Backyard. 10 April 2018.*



Wikimedia Commons has media related to ***Soap dispensers***.

About Sanitation

Not to be confused with Sanitization.

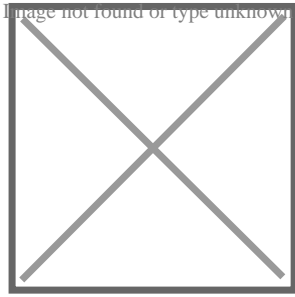


The sanitation system: collection, transport, treatment, disposal or reuse.

- v
- t
- e

Part of a series on

Public health



- Outline

Subfields

- Community health
- Dental public health
- Environmental health
- Epidemiology
- Health economics
- Health education
- Health promotion
- Health policy
- Health politics
- Mental health
- Occupational safety
- Rehabilitation (penology)
- Sexual and reproductive health
- Sanitation
- World health (Global health – International health)

Prevention

- Disease surveillance
- Harm reduction
- Health promotion (Behavior change)
- Health indicators
- Human right to water and sanitation
- Right to health
- Supervised injection site
- Universal health care

Lists and categories

- Terminology
- Journals
- National public health agencies

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Sanitation refers to public health conditions related to clean drinking water and treatment and disposal of human excreta and sewage.^[1] Preventing human contact with feces is part of sanitation, as is hand washing with soap. Sanitation systems aim to protect human health by providing a clean environment that will stop the transmission of disease, especially through the fecal–oral route.^[2] For example, diarrhea, a main cause of malnutrition and stunted growth in children, can be reduced through adequate sanitation.^[3] There are many other diseases which are easily transmitted in communities that have low levels of sanitation, such as ascariasis (a type of intestinal worm infection or helminthiasis), cholera, hepatitis, polio, schistosomiasis, and trachoma, to name just a few.

A range of sanitation technologies and approaches exists. Some examples are community-led total sanitation, container-based sanitation, ecological sanitation, emergency sanitation, environmental sanitation, onsite sanitation and sustainable

sanitation. A sanitation system includes the capture, storage, transport, treatment and disposal or reuse of human excreta and wastewater.^[4] Reuse activities within the sanitation system may focus on the nutrients, water, energy or organic matter contained in excreta and wastewater. This is referred to as the "sanitation value chain" or "sanitation economy".^[5]^[6] The people responsible for cleaning, maintaining, operating, or emptying a sanitation technology at any step of the sanitation chain are called "sanitation workers".^[7]

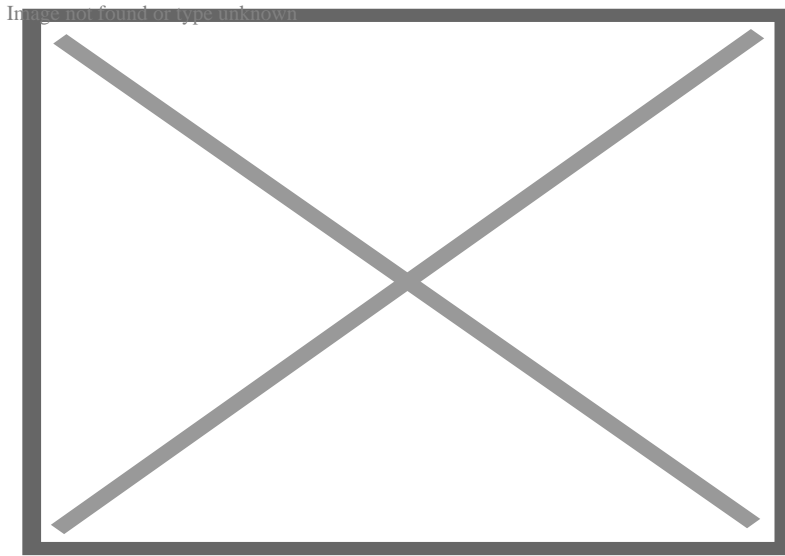
Several sanitation "levels" are being used to compare sanitation service levels within countries or across countries.^[8] The sanitation ladder defined by the Joint Monitoring Programme in 2016 starts at open defecation and moves upwards using the terms "unimproved", "limited", "basic", with the highest level being "safely managed".^[8] This is particularly applicable to developing countries.

The Human right to water and sanitation was recognized by the United Nations General Assembly in 2010. Sanitation is a global development priority and the subject of Sustainable Development Goal 6.^[9] The estimate in 2017 by JMP states that 4.5 billion people currently do not have safely managed sanitation.^[9] Lack of access to sanitation has an impact not only on public health but also on human dignity and personal safety.

Definitions

[edit]

Animated video to underline the importance of sanitation (here with a focus on toilets) on public health in developing countries



Urban improved sanitation facilities versus rural improved sanitation facilities, 2015.^[10]

There are some variations on the use of the term "sanitation" between countries and organizations. The World Health Organization defines the term "sanitation" as follows:

"Sanitation generally refers to the provision of facilities and services for the safe disposal of human urine and faeces. The word 'sanitation' also refers to the maintenance of hygienic conditions, through services such as garbage collection and wastewater disposal."^[11]

Sanitation includes all four of these technical and non-technical systems: Excreta management systems, wastewater management systems (included here are wastewater treatment plants), solid waste management systems as well as drainage systems for rainwater, also called stormwater drainage.^[citation needed] However, many in the WASH sector only include excreta management in their definition of sanitation.

Another example of what is included in sanitation is found in the handbook by Sphere on "Humanitarian Charter and Minimum Standards in Humanitarian Response" which describes minimum standards in four "key response sectors" in humanitarian response situations. One of them is "Water Supply, Sanitation and Hygiene Promotion"

(WASH) and it includes the following areas: Hygiene promotion, water supply, excreta management, vector control, solid waste management and WASH in disease outbreaks and healthcare settings.^[12]

Hygiene promotion is seen by many as an integral part of sanitation. The Water Supply and Sanitation Collaborative Council defines sanitation as "The collection, transport, treatment and disposal or reuse of human excreta, domestic wastewater and solid waste, and associated hygiene promotion."^[13]

Despite the fact that sanitation includes wastewater treatment, the two terms are often used side by side as "sanitation and wastewater management".

Another definition is in the DFID guidance manual on water supply and sanitation programmes from 1998:^[14]

"For the purposes of this manual, the word 'sanitation' alone is taken to mean the safe management of human excreta. It therefore includes both the 'hardware' (e.g. latrines and sewers) and the 'software' (regulation, hygiene promotion) needed to reduce faecal-oral disease transmission. It encompasses too the re-use and ultimate disposal of human excreta. The term environmental sanitation is used to cover the wider concept of controlling all the factors in the physical environment which may have deleterious impacts on human health and well-being. In developing countries, it normally includes drainage, solid waste management, and vector control, in addition to the activities covered by the definition of sanitation."

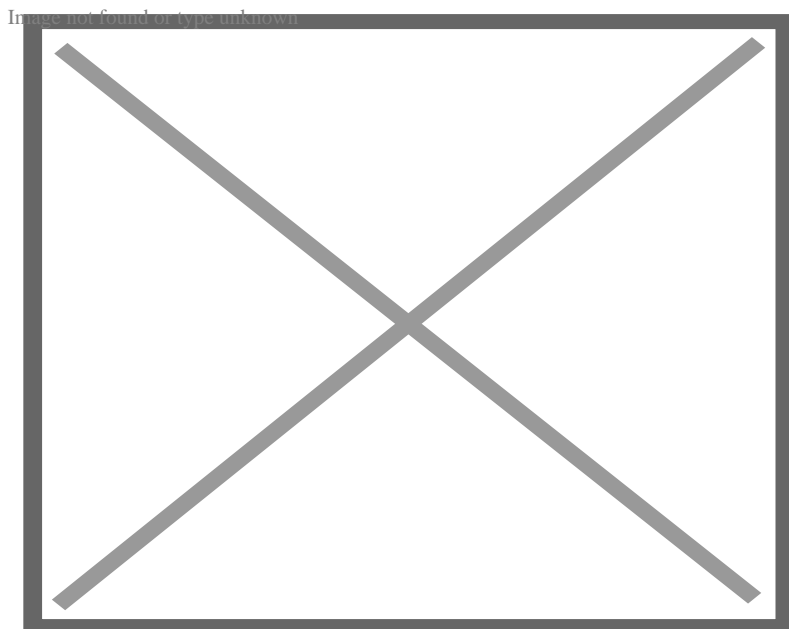
Sanitation can include personal sanitation and public hygiene. Personal sanitation work can include handling menstrual waste, cleaning household toilets, and managing household garbage. Public sanitation work can involve garbage collection, transfer and treatment (municipal solid waste management), cleaning drains, streets, schools, trains, public spaces, community toilets and public toilets, sewers, operating sewage treatment plants, etc.^[15]

Workers who provide these services for other people

are called sanitation workers.

Purposes

[edit]



Access to safe drinking water and sanitation (2016)

The overall purposes of sanitation are to provide a healthy living environment for everyone, to protect the natural resources (such as surface water, groundwater, soil), and to provide safety, security and dignity for people when they defecate or urinate.^[citation needed]

The Human Right to Water and Sanitation was recognized by the United Nations (UN) General Assembly in 2010.^{[16][17][18]} It has been recognized in international law through human rights treaties, declarations and other standards. It is derived from the human right to an adequate standard of living.^[19]

Effective sanitation systems provide barriers between excreta and humans in such a way as to break the disease transmission cycle (for example in the case of fecal-borne diseases).^[20] This aspect is visualised with the F-diagram where all major routes of fecal-oral disease transmission begin with the letter F: feces, fingers, flies, fields, fluids, food.^[21]

Sanitation infrastructure has to be adapted to several specific contexts including consumers' expectations and local resources available.^[citation needed]

Sanitation technologies may involve centralized civil engineering structures like sewer systems, sewage treatment, surface runoff treatment and solid waste landfills. These structures are designed to treat wastewater and municipal solid waste. Sanitation technologies may also take the form of relatively simple onsite sanitation systems. This can in some cases consist of a simple pit latrine or other type of non-flush toilet for the excreta management part.

Providing sanitation to people requires attention to the entire system, not just focusing on technical aspects such as the toilet, fecal sludge management or the wastewater treatment plant.^[22] The "sanitation chain" involves the experience of the user, excreta and wastewater collection methods, transporting and treatment of waste, and reuse or disposal. All need to be thoroughly considered.^[22]

Economic impacts

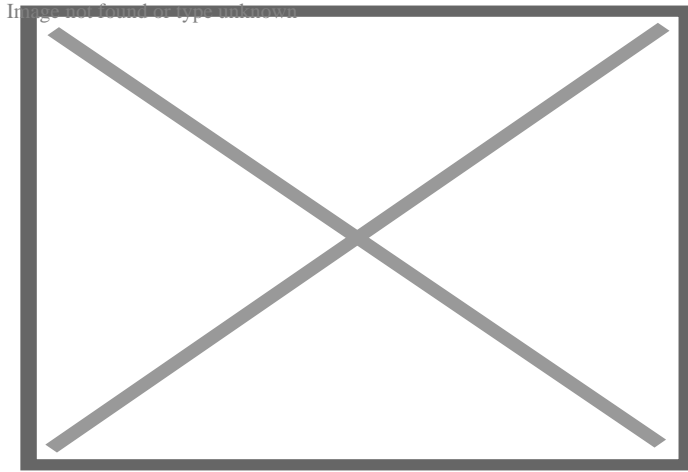
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The benefits to society of managing human excreta are considerable, for public health as well as for the environment. As a rough estimate: For every US\$1 spent on sanitation, the return to society is US\$5.50.^[23]

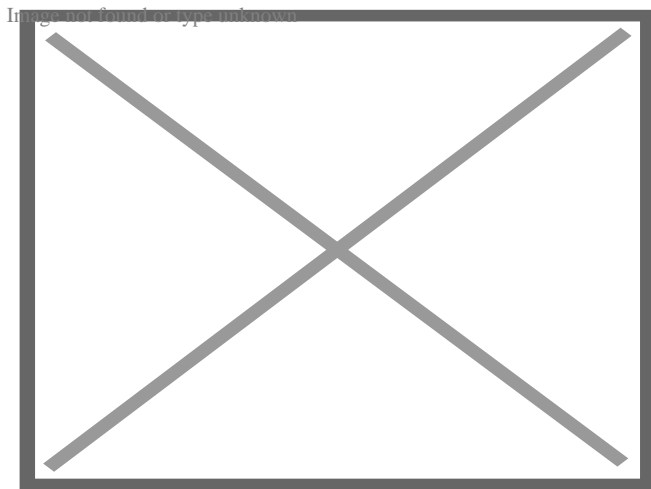
For developing countries, the economic costs of inadequate sanitation is a huge concern. For example, according to a World Bank study, economic losses due to inadequate sanitation to The Indian economy are equivalent to 6.4% of its GDP.^[24] Most of these are due to premature mortality, time lost in accessing, loss of productivity, additional costs for healthcare among others.^[24] Inadequate sanitation also leads to loss from potential tourism revenue.^[24] This study also found that impacts are disproportionately higher for the poor, women and children. Availability of toilet at home on the other hand, positively contributes to economic well-being of women as it leads to an increase in literacy and participation in labor force.^[25]

Types and concepts (for excreta management)

[edit]



Percentage of population served by different types of sanitation systems[26]



Example of sanitation infrastructure: Shower, double-vault urine-diverting dry toilet (UDDT) and waterless urinal in Lima, Peru

The term sanitation is connected with various descriptors or adjectives to signify certain types of sanitation systems (which may deal only with human excreta management or with the entire sanitation system, i.e. also greywater, stormwater and solid waste management) – in alphabetical order:

Basic sanitation

[edit]

In 2017, JMP defined a new term: "basic sanitation service". This is defined as the use of improved sanitation facilities that are not shared with other households. A lower level of service is now called "limited sanitation service" which refers to use of improved sanitation facilities that are shared between two or more households.^[9]

Container-based sanitation

[edit]

This section is an excerpt from Container-based sanitation.^[edit]

Container-based sanitation (abbreviated as CBS) refers to a sanitation system where toilets collect human excreta in sealable, removable containers (also called cartridges) that are transported to treatment facilities.^[27] This type of sanitation involves a commercial service which provides certain types of portable toilets, and delivers empty containers when picking up full ones. The service transports and safely disposes of or reuses collected excreta. The cost of collection of excreta is usually borne by the users. With suitable development, support and functioning partnerships, CBS can be used to provide low-income urban populations with safe collection, transport and treatment of excrement at a lower cost than installing and maintaining sewers.^[28] In most cases, CBS is based on the use of urine-diverting dry toilets.

Community-based sanitation

[edit]

Community-based sanitation is related to decentralized wastewater treatment (DEWATS).^[citation needed]

Community-led total sanitation

[edit]

This section is an excerpt from Community-led total sanitation.[edit]

Dry sanitation

[edit]

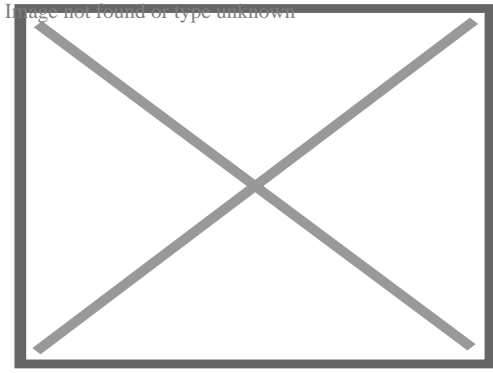
The term "dry sanitation" is not in widespread use and is not very well defined. It usually refers to a system that uses a type of dry toilet and no sewers to transport excreta. Often when people speak of "dry sanitation" they mean a sanitation system that uses urine-diverting dry toilet (UDDTs).[²⁹][³⁰]

Ecological sanitation

[edit]

This section is an excerpt from Ecological sanitation.[edit]

Ecological sanitation, commonly abbreviated as ecosan (also spelled eco-san or EcoSan), is an approach to sanitation provision which aims to safely reuse excreta in agriculture.[³¹] It is an approach, rather than a technology or a device which is characterized by a desire to "close the loop", mainly for the nutrients and organic matter between sanitation and agriculture in a safe manner. One of the aims is to minimise the use of non-renewable resources. When properly designed and operated, ecosan systems provide a hygienically safe system to convert human excreta into nutrients to be returned to the soil, and water to be returned to the land. Ecosan is also called resource-oriented sanitation.



Emergency pit lining kits by Evenproducts

Emergency sanitation

[edit]

This section is an excerpt from Emergency sanitation.[edit]

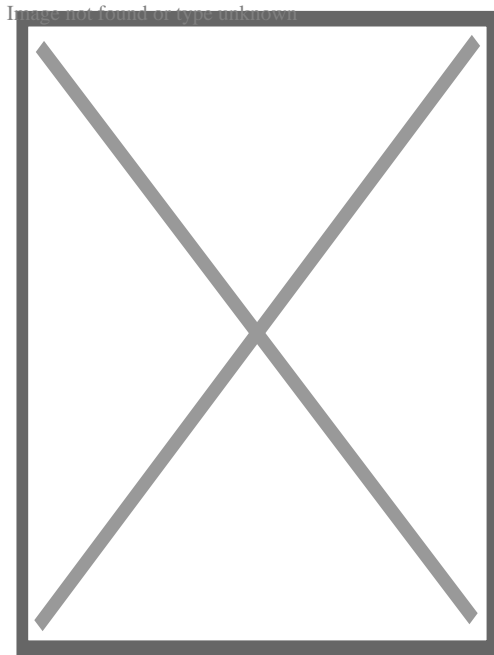
Emergency sanitation is the management and technical processes required to provide sanitation in emergency situations. Emergency sanitation is required during humanitarian relief operations for refugees, people affected by natural disasters and internally displaced persons.^[32] There are three phases of emergency response: Immediate, short term and long term.^[32] In the immediate phase, the focus is on managing open defecation, and toilet technologies might include very basic latrines, pit latrines, bucket toilets, container-based toilets, chemical toilets. The short term phase might also involve technologies such as urine-diverting dry toilets, septic tanks, decentralized wastewater systems. Providing handwashing facilities and management of fecal sludge are also part of emergency sanitation.

Environmental sanitation

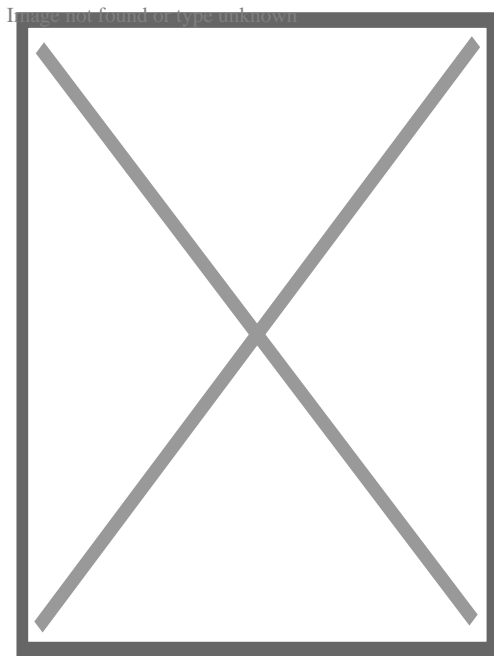
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Environmental sanitation encompasses the control of environmental factors that are connected to disease transmission. Subsets of this category are solid waste management, water and wastewater treatment, industrial waste treatment and noise pollution control. According to World health organization (WHO) Environmental

sanitation was defined as the control of all those factors in the physical environment which exercise a harmful effect on human being physical development, health and survival. One of the primary function of environmental sanitation is to protect public health.^[citation needed]



Environmental sanitation by an NGO member



A clean exercise organized by an NGO

Fecal sludge management

[edit]

This section is an excerpt from Fecal sludge management.[edit]

Fecal sludge management (FSM) (or faecal sludge management in British English) is the storage, collection, transport, treatment and safe end use or disposal of fecal sludge.^[33] Together, the collection, transport, treatment and end use of fecal sludge constitute the "value chain" or "service chain" of fecal sludge management. Fecal sludge is defined very broadly as what accumulates in onsite sanitation systems (e.g. pit latrines, septic tanks and container-based solutions) and specifically is not transported through a sewer. It is composed of human excreta, but also anything else that may go into an onsite containment technology, such as flushwater, cleansing materials (e.g. toilet paper and anal cleansing materials), menstrual hygiene products, grey water (i.e. bathing or kitchen water, including fats, oils and grease), and solid waste. Fecal sludge that is removed from septic tanks is called septage.

Improved and unimproved sanitation

[edit]

This section is an excerpt from Improved sanitation.[edit]

Improved sanitation (related to but distinct from a "safely managed sanitation service") is a term used to categorize types of sanitation for monitoring purposes. It refers to the management of human feces at the household level. The term was coined by the Joint Monitoring Program (JMP) for Water Supply and Sanitation of UNICEF and WHO in 2002 to help monitor the progress towards Goal Number 7 of the Millennium Development Goals (MDGs). The opposite of "improved sanitation" has been termed "unimproved sanitation" in the JMP definitions. The same terms are used to monitor progress towards Sustainable Development Goal 6 (Target 6.2, Indicator 6.2.1) from 2015 onwards.^[34] Here, they are a component of the definition for "safely managed sanitation service".

Lack of sanitation

[edit]

Lack of sanitation refers to the absence of sanitation. In practical terms it usually means lack of toilets or lack of hygienic toilets that anybody would want to use voluntarily. The result of lack of sanitation is usually open defecation (and open urination but this is of less concern) with associated serious public health issues.^[35] It is estimated that 2.4 billion people still lacked improved sanitation facilities including 660 million people who lack access to safe drinking water as of 2015.^[36]^[37]

Onsite sanitation or non-sewered sanitation system

[edit]

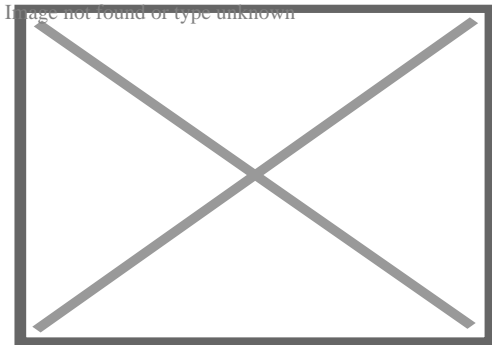
Onsite sanitation (or on-site sanitation) is defined as "a sanitation system in which excreta and wastewater are collected and stored or treated on the plot where they are generated".^[22] Another term that is used for the same system is non-sewered sanitation systems (NSSS), which are prevalent in many countries.^[38] NSSS play a vital role in the safe management of fecal sludge, accounting for approximately half of all existing sanitation provisions.^[38] The degree of treatment may be variable, from none to advanced. Examples are pit latrines (no treatment) and septic tanks (primary treatment of wastewater). On-site sanitation systems are often connected to fecal sludge management (FSM) systems where the fecal sludge that is generated onsite is treated at an offsite location. Wastewater (sewage) is only generated when piped water supply is available within the buildings or close to them.^[citation needed]

A related term is a decentralized wastewater system which refers in particular to the wastewater part of on-site sanitation. Similarly, an onsite sewage facility can treat the wastewater generated locally.^[citation needed]

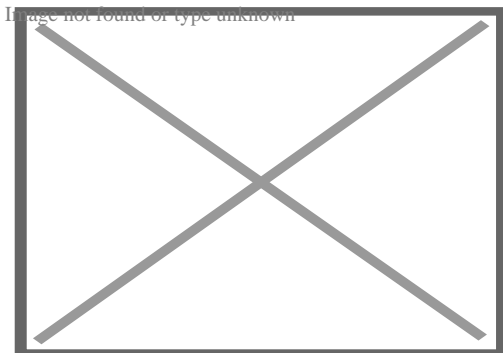
The global methane emissions from NSSS in 2020 was estimated to as 377 Mt CO₂e per year or 4.7% of global anthropogenic methane emissions, which are comparable to the greenhouse gas emissions from wastewater treatment plants.^[38] This means that the GHG emissions from the NSSS as a non-negligible source.^[38]

Safely managed sanitation

[edit]



Share of population using safely managed sanitation facilities in 2022^[39]



Number of handwashing facilities in the world, 2022

Safely managed sanitation is the highest level of household sanitation envisioned by the Sustainable Development Goal Number 6.^[40] It is measured under the Sustainable Development Goal 6.2, Indicator 6.2.1, as the "Proportion of population using (a) safely managed sanitation services and (b) a hand-washing facility with soap and water".^[41]^[9] The current value in the 2017 baseline estimate by JMP is that 4.5 billion people currently do not have safely managed sanitation.^[9]

Safely managed sanitation is defined as an improved sanitation facility which is not shared with other households, and where the excreta produced is either treated and disposed in situ, stored temporarily and then emptied and transported to treatment off-site, or transported through a sewer with wastewater and then treated off-site.^[41] In other words, safely managed sanitation is a basic sanitation service where in addition excreta are safely disposed of in situ or transported and treated offsite.^[9]

Sustainable sanitation

[edit]

This section is an excerpt from Sustainable sanitation.[edit]

Sustainable sanitation is a sanitation system designed to meet certain criteria and to work well over the long-term. Sustainable sanitation systems consider the entire "sanitation value chain", from the experience of the user, excreta and wastewater collection methods, transportation or conveyance of waste, treatment, and reuse or disposal.^[42] The Sustainable Sanitation Alliance (SuSanA) includes five features (or criteria) in its definition of "sustainable sanitation": Systems need to be economically and socially acceptable, technically and institutionally appropriate and protect the environment and natural resources.^[43]

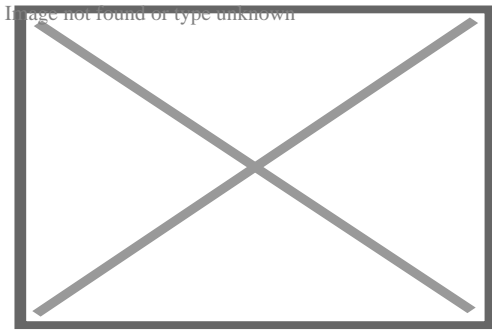
Other types, concepts and systems

[edit]

Wastewater management

[edit]

Main articles: Wastewater and Wastewater treatment



Sewage treatment plant, Australia.

Wastewater management consists of collection, wastewater treatment (be it municipal or industrial wastewater), disposal or reuse of treated wastewater. The latter is also referred to as water reclamation.^[*citation needed*]

Sanitation systems in urban areas of developed countries usually consist of the collection of wastewater in gravity driven sewers, its treatment in wastewater treatment plants for reuse or disposal in rivers, lakes or the sea.^[*citation needed*]

In developing countries most wastewater is still discharged untreated into the environment. Alternatives to centralized sewer systems include onsite sanitation, decentralized wastewater systems, dry toilets connected to fecal sludge management.

Stormwater drainage

[edit]

Main article: Storm drain

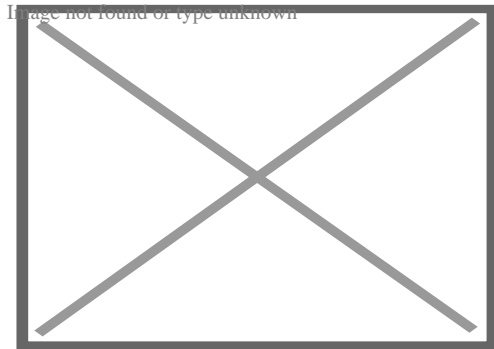
Sewers are either combined with storm drains or separated from them as sanitary sewers. Combined sewers are usually found in the central, older parts or urban areas. Heavy rainfall and inadequate maintenance can lead to combined sewer overflows or sanitary sewer overflows, i.e., more or less diluted raw sewage being discharged into the environment. Industries often discharge wastewater into municipal sewers, which can complicate wastewater treatment unless industries pre-treat their discharges.^[44]

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Solid waste disposal

[edit]

Main article: Waste management



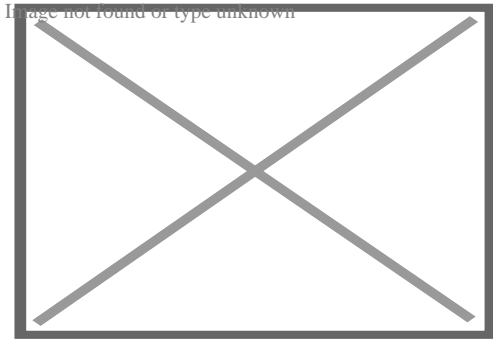
Hiriya Landfill, Israel.

Disposal of solid waste is most commonly conducted in landfills, but incineration, recycling, composting and conversion to biofuels are also avenues. In the case of landfills, advanced countries typically have rigid protocols for daily cover with topsoil, where underdeveloped countries customarily rely upon less stringent protocols.^[45] The importance of daily cover lies in the reduction of vector contact and spreading of pathogens. Daily cover also minimizes odor emissions and reduces windblown litter. Likewise, developed countries typically have requirements for perimeter sealing of the landfill with clay-type soils to minimize migration of leachate that could contaminate groundwater (and hence jeopardize some drinking water supplies).

For incineration options, the release of air pollutants, including certain toxic components is an attendant adverse outcome. Recycling and biofuel conversion are the sustainable options that generally have superior lifecycle costs, particularly when total ecological consequences are considered.^[46] Composting value will ultimately be limited by the market demand for compost product.^[citation needed]

Food safety

[edit]



Modern restaurant food preparation area.

Main article: Food safety

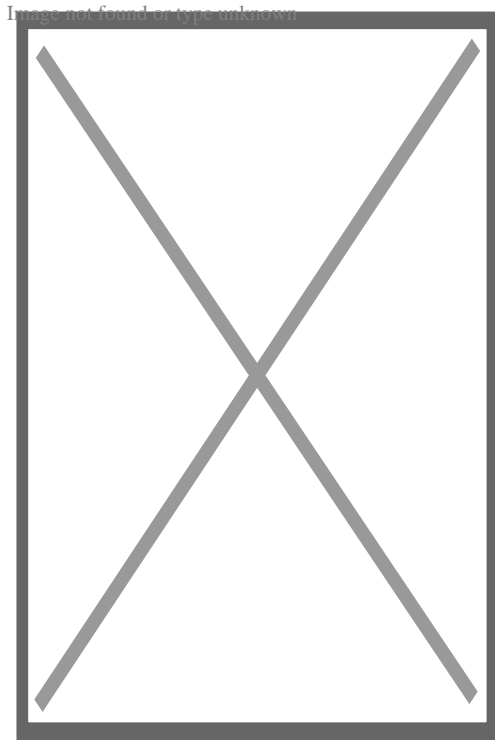
Sanitation within the food industry means the adequate treatment of food-contact surfaces by a process that is effective in destroying vegetative cells of microorganisms of public health significance, and in substantially reducing numbers of other undesirable microorganisms, but without adversely affecting the food or its safety for the consumer (U.S. Food and Drug Administration, Code of Federal Regulations, 21CFR110, USA). Sanitation Standard Operating Procedures are mandatory for food industries in United States. Similarly, in Japan, food hygiene has to be achieved through compliance with food sanitation law.^[47]

In the food and biopharmaceutical industries, the term "sanitary equipment" means equipment that is fully cleanable using clean-in-place (CIP) and sterilization-in-place (SIP) procedures: that is fully drainable from cleaning solutions and other liquids. The design should have a minimum amount of deadleg, or areas where the turbulence during cleaning is insufficient to remove product deposits.^[48] In general, to improve cleanability, this equipment is made from Stainless Steel 316L, (an alloy containing small amounts of molybdenum). The surface is usually electropolished to an effective surface roughness of less than 0.5 micrometre to reduce the possibility of bacterial adhesion.

Hygiene promotion

[edit]

Further information: Hygiene



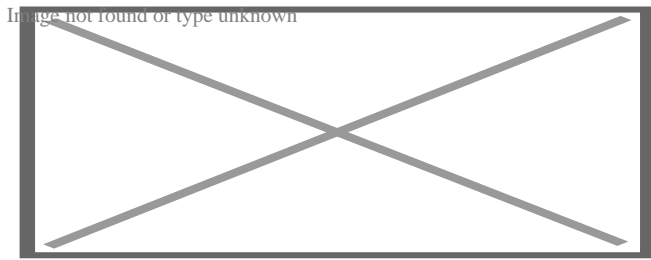
Hygiene education (on proper handwashing) in Afghanistan

In many settings, provision of sanitation facilities alone does not guarantee good health of the population. Studies have suggested that the impact of hygiene practices have as great an impact on sanitation related diseases as the actual provision of sanitation facilities. Hygiene promotion is therefore an important part of sanitation and is usually key in maintaining good health.^[49]

Hygiene promotion is a planned approach of enabling people to act and change their behavior in an order to reduce and/or prevent incidences of water, sanitation and hygiene (WASH)^[50] related diseases. It usually involves a participatory approach of engaging people to take responsibility of WASH services and infrastructure including its operation and maintenance. The three key elements of promoting hygiene are; mutual sharing of information and knowledge, the mobilization of affected communities and the provision of essential material and facilities.^[12]

Health aspects

[edit]



The "F-diagram" (feces, fingers, flies, fields, fluids, food), showing pathways of fecal-oral disease transmission. The vertical blue lines show barriers: toilets, safe water, hygiene and handwashing.

A video shedding light on the unsafe and undignified working conditions of many sanitation workers in India

Main article: WASH § Health aspects

This section is an excerpt from WASH § WASH-attributable burden of diseases and injuries.[edit]

The WHO has investigated which proportion of death and disease worldwide can be attributed to insufficient WASH services. In their analysis they focus on the following four health outcomes: diarrhea, acute respiratory infections, malnutrition, and soil-transmitted Helminthiasis (STHs).^[51] These health outcomes are also included as an indicator for achieving Sustainable Development Goal 3 ("Good Health and Well-being"): Indicator 3.9.2 reports on the "mortality rate attributed to unsafe water, sanitation, and lack of hygiene".

In 2023, WHO summarized the available data with the following key findings: "In 2019, use of safe WASH services could have prevented the loss of at least 1.4 million lives and 74 million disability-adjusted life years (DALYs) from four health outcomes. This represents 2.5% of all deaths and 2.9% of all DALYs globally."^[51] Of the four health outcomes studied, it was diarrheal disease that had the most striking correlation, namely the highest number of "attributable burden of disease": over 1 million deaths and 55 million DALYs from diarrheal diseases were linked with lack of WASH. Of these deaths, 564,000 deaths were linked to unsafe sanitation in particular.

Environmental aspects

[edit]

Indicator organisms

[edit]

When analyzing environmental samples, various types of indicator organisms are used to check for fecal pollution of the sample. Commonly used indicators for bacteriological water analysis include the bacterium *Escherichia coli* (abbreviated as *E. coli*) and non-specific fecal coliforms. With regards to samples of soil, sewage sludge, biosolids or fecal matter from dry toilets, helminth eggs are a commonly used indicator. With helminth egg analysis, eggs are extracted from the sample after which a viability test is done to distinguish between viable and non viable eggs. The viable fraction of the helminth eggs in the sample is then counted.

Climate change

[edit]

Main article: WASH § Climate change aspects

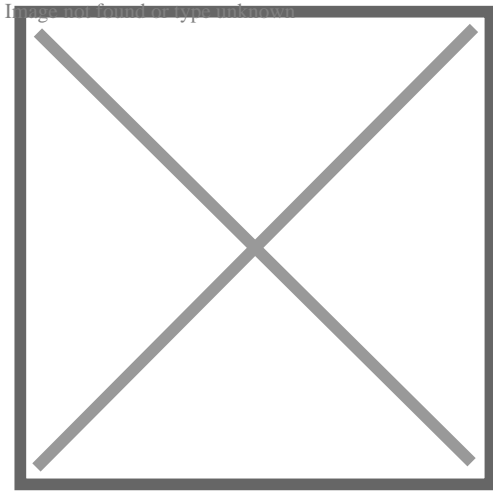
Global mechanisms

[edit]

Sustainable Development Goal Number 6

[edit]

Further information: Sustainable Development Goal 6



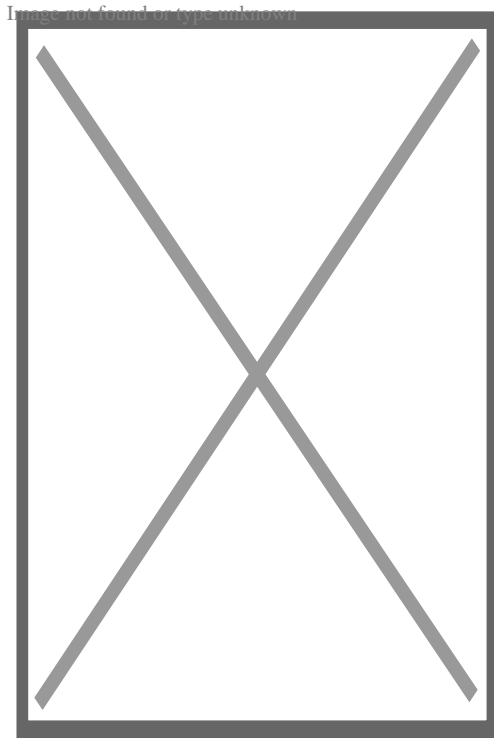
United Nations SDG 6 Logo

In the year 2016, the Sustainable Development Goals replaced the Millennium Development Goals. Sanitation is a global development priority and included Sustainable Development Goal 6 (SDG 6).^[9] The target is about "clean water and sanitation for all" by 2030.^[52] It is estimated that 660 million people still lacked access to safe drinking water as of 2015.^{[36][37]}

Since the COVID-19 pandemic in 2020, the fight for clean water and sanitation is more important than ever. Handwashing is one of the most common prevention methods for Coronavirus, yet two out of five people do not have access to a hand-washing station.^[53]

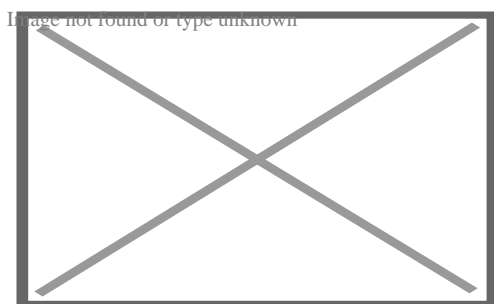
Millennium Development Goal Number 7 until 2015

[edit]



Example for lack of sanitation: Unhygienic pit latrine with ring slab in Kalibari community in Mymensingh, Bangladesh

The United Nations, during the Millennium Summit in New York in 2000 and the 2002 World Summit on Sustainable Development in Johannesburg, developed the Millennium Development Goals (MDGs) aimed at poverty eradication and sustainable development. The specific sanitation goal for the year 2015 was to reduce by half the number of people who had no access to potable water and sanitation in the baseline year of 1990. As the JMP and the United Nations Development Programme (UNDP) Human Development Report in 2006 has shown, progress meeting the MDG sanitation target is slow, with a large gap between the target coverage and the current reality.



Modified logo of International Year of Sanitation, used in the UN Drive to 2015 campaign logo

In December 2006, the United Nations General Assembly declared 2008 "The International Year of Sanitation", in recognition of the slow progress being made towards the MDGs sanitation target.^[54] The year aimed to develop awareness and more actions to meet the target.

There are numerous reasons for this gap. A major one is that sanitation is rarely given political attention received by other topics despite its key importance. Sanitation is not high on the international development agenda, and projects such as those relating to water supply projects are emphasised.^[55]

The Joint Monitoring Programme for Water Supply and Sanitation of WHO and UNICEF (JMP) has been publishing reports of updated estimates every two years on the use of various types of drinking-water sources and sanitation facilities at the national, regional and global levels. The JMP report for 2015 stated that:^[36]

- Between 1990 and 2015, open defecation rates have decreased from 38% to 25% globally. Just under one billion people (946 million) still practise open defecation worldwide in 2015.
- 82% of the global urban population, and 51% of the rural population is using improved sanitation facilities in 2015, as per the JMP definition of "improved sanitation".^[56]

Initiatives to promote sanitation

[edit]

In 2011 the Bill & Melinda Gates Foundation launched the "Reinvent the Toilet Challenge" to promote safer, more effective ways to treat human waste.^[57] The program is aimed at developing technologies that might help bridge the global sanitation gap (for example the Omni Processor, or technology for fecal sludge management). In 2015, the Bill & Melinda Gates Foundation published their "Water,

sanitation, and hygiene strategy portfolio update and overview" called "Building demand for sanitation".^[58]

The latest innovations in the field of public health sanitation, currently in the testing phase, comprise – use of 'locally produced alcohol-based hand rub'; 'novel latrine improvement'; and 'container-based sanitation'. Centers for Disease Control and Prevention (CDC), the national public health agency of the United States has recognized the stated three initiatives.

Capacity development

[edit]

Capacity development is regarded as an important mechanism to achieve progress in the sanitation sector.^[59] For example, in India the Sanitation Capacity Building platform (SCBP) was designed to "support and build the capacity of town/cities to plan and implement decentralized sanitation solutions" with funding by the Bill & Melinda Gates Foundation from 2015 to 2022.^{[60][61]} Results from this project showed that capacity development best happens on the job and in a learning organization culture.^[62] In a government capacity development initiative, it is critical to have an enabling policy and program funding to translate capacity development input into program and infrastructure outputs. Capacity development aims to empower staff and institutions, develop a learning strategy, learning content and training modules, as well as strengthened partnerships and institutions of learning.^[62] The Capacity Development Effectiveness Ladder Framework (CDEL) identifies five critical steps for capacity development interventions: Developing original learning content, partnerships for learning and outreach, learning strategy, visioning change and designing solutions, contribution to capacity development discourse.^{[62][63]}

Costs

[edit]

A study was carried out in 2018 to compare the lifecycle costs of full sanitation chain systems in developing cities of Africa and Asia. It found that conventional sewer systems are in most cases the most expensive sanitation options, followed, in order of cost, by sanitation systems comprising septic tanks, ventilated improved pit latrines (VIP), urine diversion dry toilets and pour-flush pit latrines.^[64] The main determinants of urban sanitation financial costs include: Type of technology, labour, material and utility cost, density, topography, level of service provided by the sanitation system, soil condition, energy cost and others (distance to wastewater treatment facility, climate, end-use of treatment products, business models, water table height).^[64]

Some grassroots organizations have trialled community-managed toilet blocks whose construction and maintenance costs can be covered by households. One study of Mumbai informal settlements found that US\$1.58 per adult would be sufficient for construction, and less than US\$1/household/month would be sufficient for maintenance.^[65]

History

[edit]

Further information: History of water supply and sanitation, Toilet § History, and History of waste management

Major human settlements could initially develop only where fresh surface water was plentiful, such as near rivers or natural springs. Throughout history people have devised systems to get water into their communities and households, and to dispose (and later also treat) wastewater.^[66] The focus of sewage treatment at that time was on conveying raw sewage to a natural body of water, e.g. a river or ocean, where it would be diluted and dissipated.

The Sanitation in the Indus Valley Civilization in Asia is an example of public water supply and sanitation during the Bronze Age (3300–1300 BCE). Sanitation in ancient Rome was quite extensive. These systems consisted of stone and wooden drains to

collect and remove wastewater from populated areas—see for instance the Cloaca Maxima into the River Tiber in Rome. The first sewers of ancient Rome were built between 800 and 735 BCE.^[67]

By country

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Water supply and sanitation by country

- Afghanistan
- Algeria
- Angola
- Argentina
- Australia
- Azerbaijan
- Bangladesh
- Belgium
- Belize
- Benin
- Bhutan
- Bolivia
- Bosnia and Herzegovina
- Brazil
- Burkina Faso
- Cambodia
- Canada
- Chile
- China
- Colombia
- Costa Rica
- Cuba
- Democratic Republic of the Congo
- Denmark
- Dominican Republic
- Ecuador
- Egypt
- El Salvador
- Ethiopia
- France
- Georgia
- Germany
- Ghana
- Greece
- Grenada

Society and culture

[edit]

There is a vast number of professions that are involved in the field of sanitation, for example on the technical and operations side: sanitation workers, waste collectors, sanitary engineers.

See also

[edit]

- List of abbreviations used in sanitation
- List of countries by proportion of the population using improved sanitation facilities
- List of water supply and sanitation by country
- Environmental health
- Water pollution
- Water security
- Self-supply of water and sanitation
- Sustainable Sanitation Alliance
- World Toilet Day

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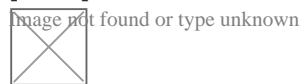
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External links

[edit]



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- Sustainable Sanitation Alliance
- Sanitation and Wastewater Atlas of Africa
- Florence Nightingale (1863), *Sanitary Statistics of Native Colonial Schools and Hospitals*

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Public health

- Auxology
- Biological hazard
- Chief medical officer
- Cultural competence
- Deviance
- Environmental health
- Eugenics
 - History of
 - Liberal
- Euthenics
- Genomics
- Globalization and disease
- Harm reduction
- Health economics
- Health literacy
- Health policy
 - Health system
 - Health care reform
- Housing First
- Human right to water and sanitation
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 - Public health law
 - National public health institute
- Health politics
- Labor rights
- Maternal health
- Medical anthropology
- Medical sociology
- Mental health (Ministers)
- Occupational safety and health
- Pharmaceutical policy
- Pollution
 - Air
 - Water
 - Soil

General

**Preventive
healthcare**

- Behavior change
 - Theories
- Drug checking
- Family planning
- Harm reduction
- Health promotion
- Human nutrition
 - Healthy diet
 - Preventive nutrition
- Hygiene
 - Food safety
 - Hand washing
 - Infection control
 - Oral hygiene
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- Occupational safety and health
 - Human factors and ergonomics
 - Hygiene
 - Controlled Drugs
 - Injury prevention
 - Medicine
 - Nursing
- Patient safety
 - Organization
- Pharmacovigilance
- Reagent testing
- Safe sex
- Sanitation
 - Emergency
 - Fecal–oral transmission
 - Open defecation
 - Sanitary sewer
 - Waterborne diseases
 - Worker
- School hygiene

	<ul style="list-style-type: none"> ○ Biostatistics ○ Child mortality ○ Community health ○ Epidemiology ○ Global health ○ Health impact assessment ○ Health system
Population health	<ul style="list-style-type: none"> ○ Infant mortality ○ Open-source healthcare software ○ Multimorbidity ○ Public health informatics ○ Social determinants of health <ul style="list-style-type: none"> ○ Commercial determinants of health ○ Health equity ○ Race and health ○ Social medicine ○ Case-control study ○ Randomized controlled trial ○ Relative risk
Biological and epidemiological statistics	<ul style="list-style-type: none"> ○ Statistical hypothesis testing <ul style="list-style-type: none"> ○ Analysis of variance (ANOVA) ○ Regression analysis ○ ROC curve ○ Student's t-test ○ Z-test ○ Statistical software

**Infectious and
epidemic
disease
prevention**

- Asymptomatic carrier
- Epidemics
 - List
- Notifiable diseases
 - List
- Public health surveillance
 - Disease surveillance
- Quarantine
- Sexually transmitted infection
- Social distancing
- Tropical disease
- Vaccine trial
- WASH
- Food

**Food hygiene
and
safety
management**

- Additive
- Chemistry
- Engineering
- Microbiology
- Processing
- Safety
- Safety scandals
- Good agricultural practice
- Good manufacturing practice
 - HACCP
 - ISO 22000

**Health
behavioral
sciences**

- Diffusion of innovations
- Health belief model
- Health communication
- Health psychology
- Positive deviance
- PRECEDE–PROCEED model
- Social cognitive theory
- Social norms approach
- Theory of planned behavior
- Transtheoretical model

Organizations

- Caribbean
 - Caribbean Public Health Agency
- China
 - Center for Disease Control and Prevention
- Europe
 - Centre for Disease Prevention and Control
 - Committee on the Environment, Public Health and Food Safety
- Russia
 - Rospotrebnadzor
- India
 - Ministry of Health and Family Welfare
- Canada
 - Health Canada
 - Public Health Agency
- U.S.
 - Centers for Disease Control and Prevention
 - Health departments in the United States
 - Council on Education for Public Health
 - Public Health Service
- World Health Organization
- World Toilet Organization
- (Full list)
- Health education
- Higher education

Education

- Bachelor of Science in Public Health
- Doctor of Public Health
- Professional degrees of public health
- Schools of public health
- History of public health in the United Kingdom
- History of public health in the United States
- History of public health in Australia
- Sara Josephine Baker

**Organizations,
education
and history**

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- [Recycling High Density Polyethylene from Retired Units](#)
- [Reducing Line Times with Optimal Restroom Distribution](#)
- [Estimating Portable Toilet Counts Based on Event Attendance](#)

Frequently Asked Questions

What are the potential challenges and solutions in recycling HDPE from retired porta potties?

Potential challenges in recycling HDPE from retired porta potties include contamination from other materials, the need for cleaning and pre-processing, and the logistical difficulties of collecting and transporting the material. Solutions to these challenges involve improving recycling infrastructure, developing better cleaning and sorting technologies, and creating incentives for rental companies to participate in recycling

programs. Collaboration between stakeholders, including rental companies, recycling facilities, and regulatory bodies, is also crucial to overcoming these challenges.

Clean Restroom Rentals

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State : VA

Zip : 20111

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