

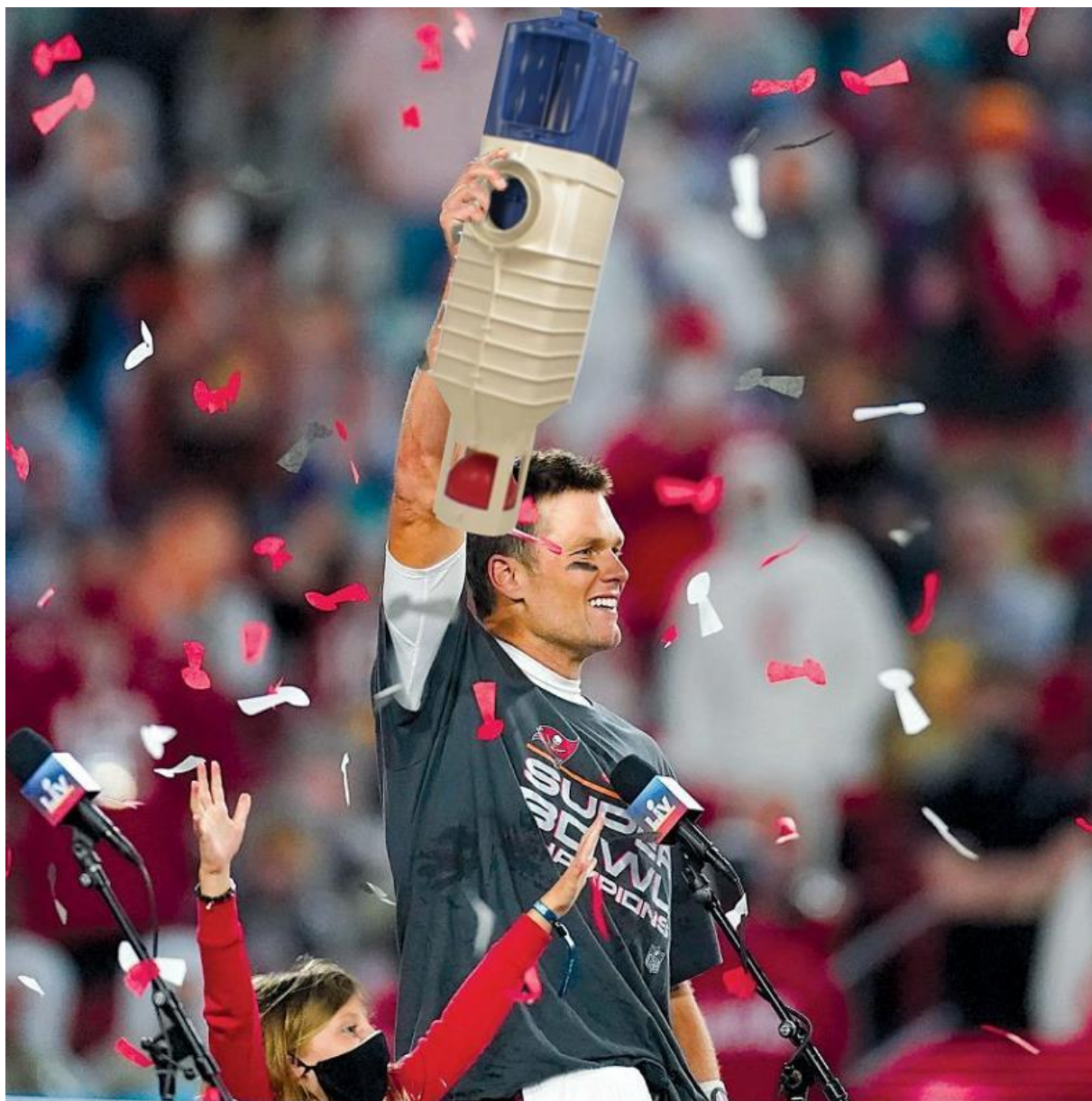
# Effluent Filters and Septic Tank Safety

June 2022

Patrick Mulhall









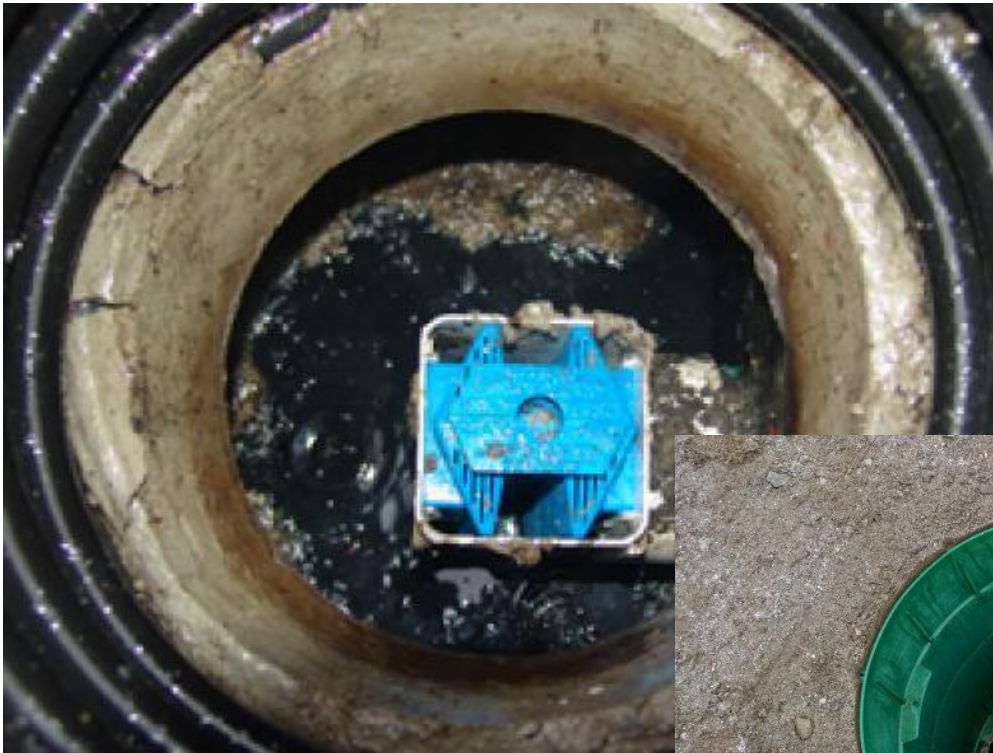
# What do they look like?



## How do they work?

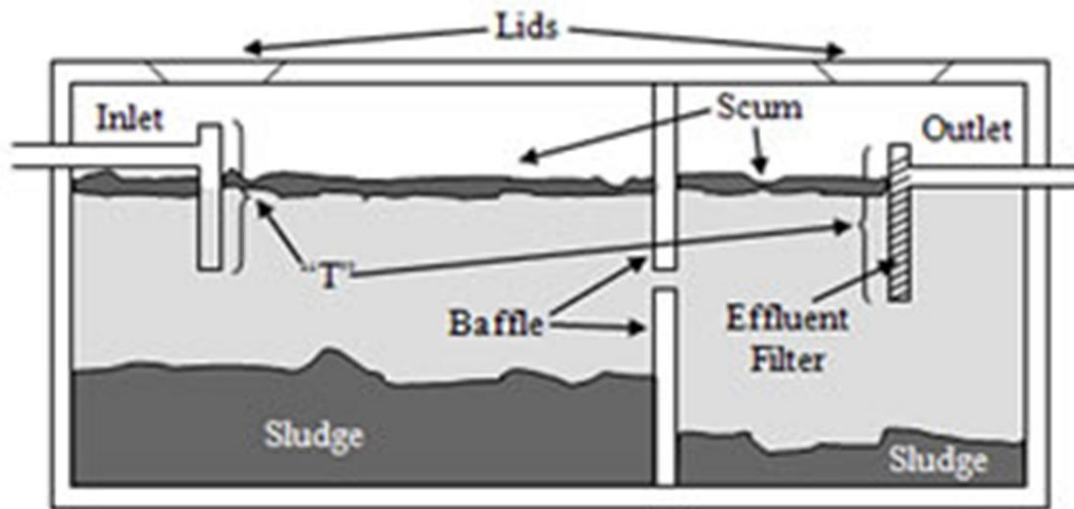
- They are removable plastic screens or mesh elements (cartridges) that trap suspended solids in the outlet baffle of a septic tank
- Openings normally range from 1.6mm to 0.8mm in size depending upon wastes
- The filtering cartridge is installed in a dedicated housing or a tee assembly
- It keeps suspended solids in the tank and prevents discharge to percolation

# What do they look like installed?

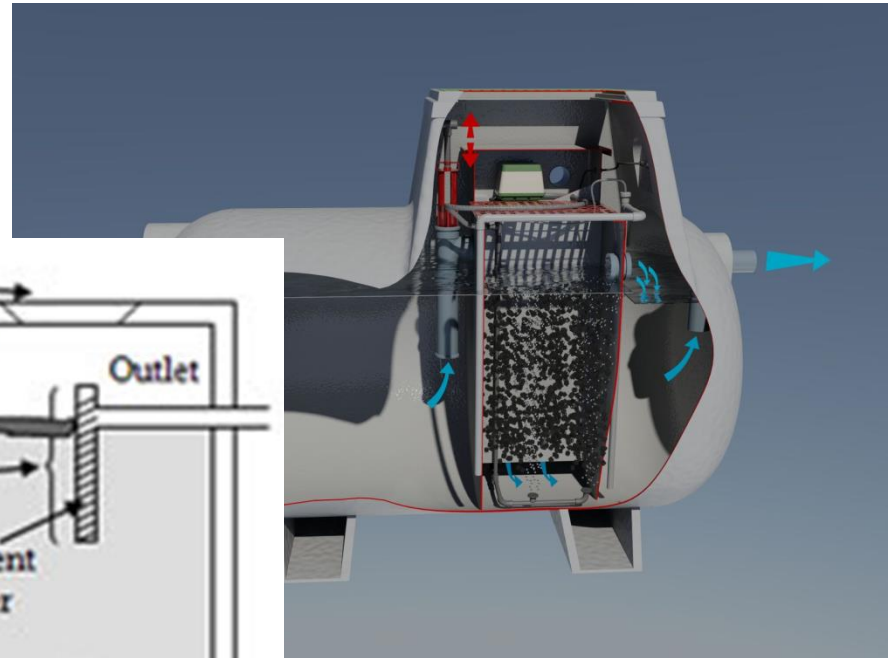


# Applications

- Residential



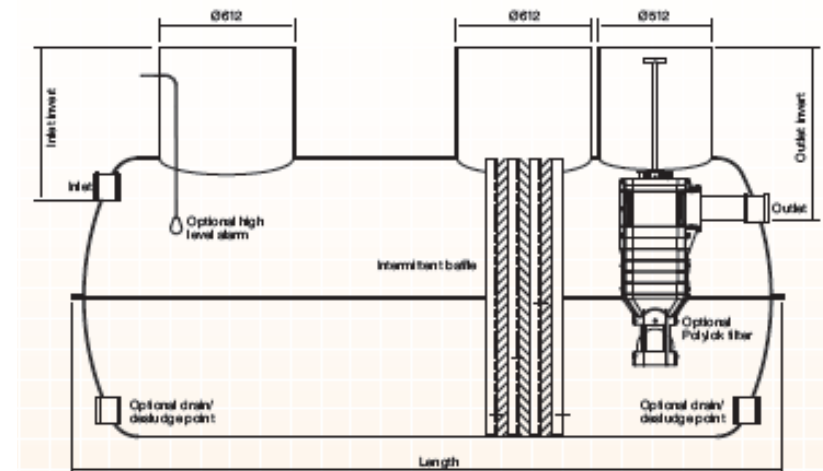
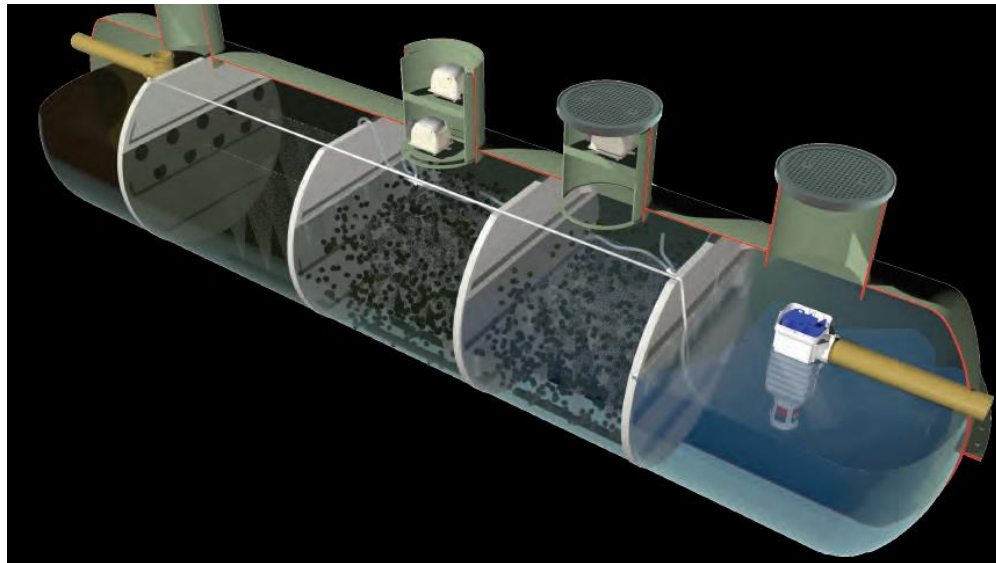
Cross-section of a two-compartment septic tank





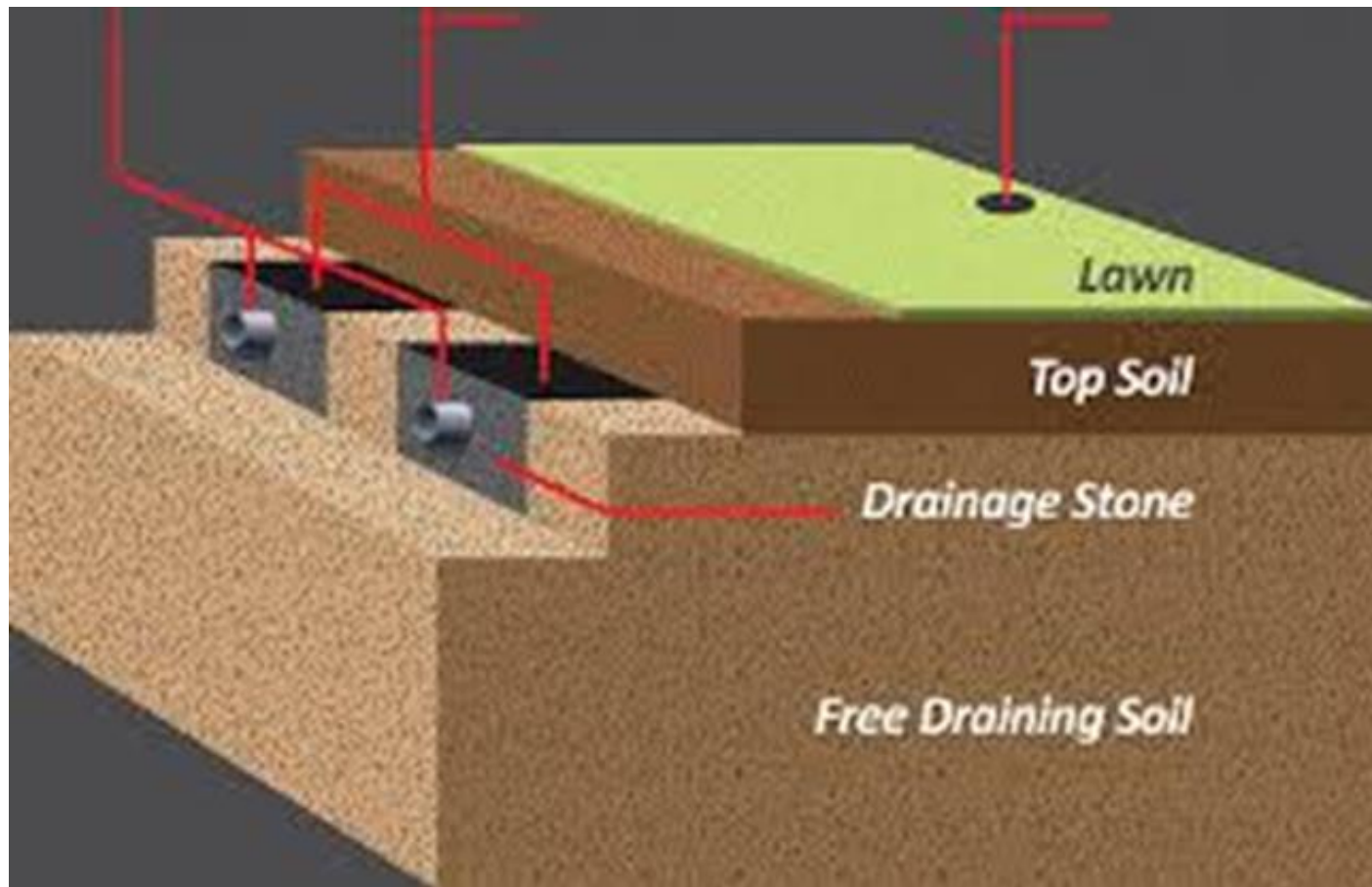
# Applications

- Septic and Grease Trap
- Commercial





# What do they protect?



# Case Study 1 – Onsite Performance Study

- Two residential sites selected in CT USA
- Both single family residents with septic tanks and percolation areas
- Both had effluent filters installed at the same time
- 45 filtered and unfiltered samples over 92 weeks and analysed for BOD & TSS

# Case Study 1 - Results

- BOD Inlets 180 -1224 mg/l
- BOD Outlet 30 – 642 mg/l
- TSS Inlet 53 -1040 mg/l
- TSS Outlet 30 – 642 mg/l
- Average BOD reduction 66%
- Average TSS reduction 59%



## Case Study 2 – Onsite Performance Study

- A commercial site selected in CT USA
- 140,000 sq ft factory with 70 staff
- Using a septic tank and percolation area
- Inlet and outlet samples taken over 6 months

## Case Study 2 - Results

- Average BOD Inlet 697 mg/l
- Average BOD Outlet 313 mg/l
- Average TSS Inlet 1610 mg/l
- Average TSS Outlet 120 mg/l
- Average BOD reduction 55%
- Average TSS reduction 93%

# Maintenance

- Yes, effluent filters do need to be cleaned!





# Massachusetts Regulations

## Effluent Filter Tees

Effluent tee filters are approved for installation at the outlet of the septic tank in lieu of an outlet tee. When installed on a septic tank, an appropriate outlet cover must be installed and maintained at grade and the filter must be inspected and cleaned at least on an annual basis.

# Filter Selection

- Typical filter rating: 800-10,000 GPD
- Filter Sizing: 1/8" – 1/64" slots
- Certification: NSF/ANSI Standard 46
- Application: Residential, Commercial, Grease Trap, Standard Septic
- Accessories: Alarm and switch
- Maintenance Expectations: Frequency of servicing

# Alarms Help Prevent Back-ups

- Devices can be connected to the system to alert when cleaning is required



- They connect to the filter
- Flash/beep when filter is mature
- Ideal for commercial and residential use



# Importance

- With no filter, you allow this to reach the field



# Failed Percolation



# Lack of Maintenance

- Costs of negligence
  - New leaching field
  - Backups into the house or business
  - Business interruption
  - Fines for FOG emissions





# Extend & Loks™

- Extends the inlet or outlet pipe to enable easy filter installation
- Fits any 3", 4" or 6" pipe on the market
- Centers the filter or tee under the riser for quick access
- Makes a difficult project a snap!



# Summary – What are filter Benefits?

- Protect the percolation areas or down stream filters from solids carryover and therefore clogging
- Reduce the discharge of suspended solids by 20 % or more
- Protects installers, engineers and regulators from premature system problems caused by owners
- Promotes routine servicing of septic tanks
- Low cost & easy to install
- Helps protect our environment

# Septic Tank Safety

- Filters help protect your septic system and leaching fields
- Safety considerations are essential when it's time to service the tank or if a tank is already at grade
- You need to make sure your team is educated about Septic Tank Safety!

# Safety

- Safety is a primary concern when it comes to onsite wastewater.
- Safety doesn't always get the attention it deserves.
- Sadly, it often takes a tragedy to educate people on the importance of taking safety precautions.
- Get **SERIOUS** about **SAFETY**!

# Septic Tank Tragedies

## Boy found dead in septic tank

January 27, 2007

By MICHAEL JAMISON of the Missoulian

KALISPELL - The body of 3-year-old Loic Rogers was found late Friday night in the septic tank of the home where he and his family were visiting when he disappeared two nights earlier.

## 2 found dead in Devils Tower KOA septic tank

DEVILS TOWER, WY - A tragic accident claimed the lives of two men Wednesday while at Devils Tower KOA campground, about 10 miles outside of Hulett, Wyo.

## Mother says she feared losing her son in grease pit



[DUKE BEHNKE](#) POST-CRESCENT MEDIA 7:11 A.M. CST JANUARY 29, 2015

## Autopsy: Lakewood toddler found dead in septic tank drowned accidentally

By [Bob Considine/The Star-Ledger](#) The Star-Ledger

on March 13, 2012 at 8:57 PM, updated March 14, 2012 at 6:12

[LAKEWOOD](#) — A sand pit protected by police tape now covers the spot in Lakewood where a 2-year-old fell through a hole in a septic tank cover and died.

## Two men found dead in septic tank

POLICE MAKE DISCOVERY AFTER WORKERS REPORTED MISSING; OSHA INVESTIGATING  
KENNEBUNKPORT, Maine — Two septic workers were found dead in an underground sewage tank at the Lodge at Turbat's Creek in Kennebunkport on Tuesday morning, prompting an investigation into the accident.

SEACOASTONLINE.COM

BY JENNIFER FEALS

POSTED SEP. 28, 2011 @ 2:00 AM



# Septic Tank Tragedies

## Autopsy shows toddler drowned after falling into open septic tank in Fruitland Park

February 6, 2014|By Jerry Fallstrom, Orlando Sentinel  
An autopsy on a toddler who died Wednesday after falling into an open septic tank in Fruitland Park determined the cause of death was drowning, police Chief Terry Isaacs said today.  
The accident occurred as friends and relatives helped residents who were moving out, police said.  
"It appears to be a very, very tragic accident," said Isaacs, who didn't immediately release the name or age of the girl because an investigation is ongoing.

## Dix Hills Septic Tank Accident Kills a Father and His Two Sons

By RICHARD PEREZ-PENA  
Published: July 25, 1994

A father and his two sons were overcome by fumes and apparently drowned while working on a septic tank in the older man's back yard in Dix Hills, L.I., yesterday, the police said.

## Girl Dies After Falling Into Septic Tank Tragic end to the search for a missing Lakewood, NJ girl

By [David Chang](#)

Read more: <http://www.nbcphiladelphia.com/news/local/Child-Dies-After-Falling-Into-Septic-Tank-Cops--142407885.html#ixzz3O3ITCsIX>

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## Tragic Discovery: Missing NJ Toddler Found Dead In Septic Tank

Yesterday evening, hours after her mother had called the police and reported her missing, a two-year-old girl was found dead in a septic tank in a nearby backyard. [According to Ocean County Prosecutor Marlene Ford](#), "The search teams found a small approximately 3 foot wide hole in the yard, apparently to a septic tank, and called in the Lakewood Township Public Works Department to pump out the water in the tank. At approximately 7:30 PM, the water level had been dropped and police and emergency personnel unfortunately made visual observation of the body of a child in that tank."

# ASTM C1227-17

- 7. Physical Design Requirements
  - 7.6 Openings in Top Slab:
    - 7.6.1 An access opening shall be located over the influent pipe and the effluent pipe. Where an opening has any dimension greater than 12 in. (300 mm), the lid shall weigh a minimum of 59 lb (27 kg) or be provided with a lock system to prevent unauthorized entrance.
    - 7.6.6 Where covers are flush with or above ground, they shall be provided with a lock system to prevent unauthorized entrance.
- 13. Product Marketing
  - 13.3 Where an access opening or an inspection opening has a dimension greater than 8 in (200 mm), a label of noncorrosive material shall be placed in a prominent place to warn everyone that “Entrance into the tank could be fatal.”

# NPCA Best Practices

## Openings in Top Slab: Access Risers and Manholes (page 23)

All access risers and manholes must be structurally sound and watertight. An access opening should be located over the influent pipe and the effluent pipe. Where an opening has any dimension greater than 12 inches (300 mm), the concrete lid should weigh a minimum of 59 pounds (27 kg) or be fitted with a lock system to prevent unauthorized entrance for materials other than concrete. Where access covers or lids are installed at grade, a secondary safety apparatus should be used in the event the cover is removed and not correctly secured. An access opening or openings shall be provided to permit pumping of all compartments. Handles should be provided when the top of a cover is flush with the top of the top slab. Handles must be made of corrosion-resistant material and be capable of supporting the weight of the cover.

# National Standard of Canada



**CSA B66:21**  
National Standard of Canada



**Design, material, and manufacturing  
requirements for prefabricated septic  
tanks and sewage holding tanks**

What does it cost to prevent a tragedy?



How much would your customer be willing to pay to prevent a tragedy in their backyard?



## Extra Precaution can be well worth the investment

Expense	Amount USD
Lawsuit	\$1.1 M (Parents of 3-year old involved in a fatal accident are currently in court with the homeowners.)
Medical Bills	\$5,406+ (Num. cited from a 2001 case)
Veterinary Bills	Walk in fee alone is \$70 - \$100 (According to city-data)
Fatality	\$5,000+ (Funeral Arrangements) Invaluable life

VS

\$50.00 for a lid. \$25 for a safety net

## What Can You Do?

- If you see an unsafe lid, don't walk away from it!



## Field of Dreams Tourist Site – Access Lids





## Field of Dreams Tourist Site – Access Lids

**Lawnmower  
damage**

**HUGE  
liability**



# Sales Opportunity = Safety Opportunity

- Regulations are requiring filters, risers to grade, and in some cases safety devices
- This is your opportunity to educate your customers
- These regulations and safety devices make your job *easier!*
- Safety Proofing can help your bottom line too!



# Your Responsibility

- You are the first line of defense against another tragedy!
- There are a lot of devices at your disposal:
  - Secondary tank lids
  - Safety screens or similar devices
  - Riser safety locks
  - Tamper resistant riser cover screws
- ***Education is the first step!***

# How do you sell Safety?

- Education, Education, Education!!!
- Regulations may mandate upgrades to systems
- Cost is MINIMAL...pennies a day!!
- Customers with children and pets may be more willing to invest in safety
- Consider your neighbors? Do they have children or pets? Do you want to protect yourself from a potential disaster?

# Educate Your Customer

- Purpose of a septic tank
- Filter necessity
- Risers to grade to facilitate access
- Septic tank and filter servicing
- Safety screen or other safety devices

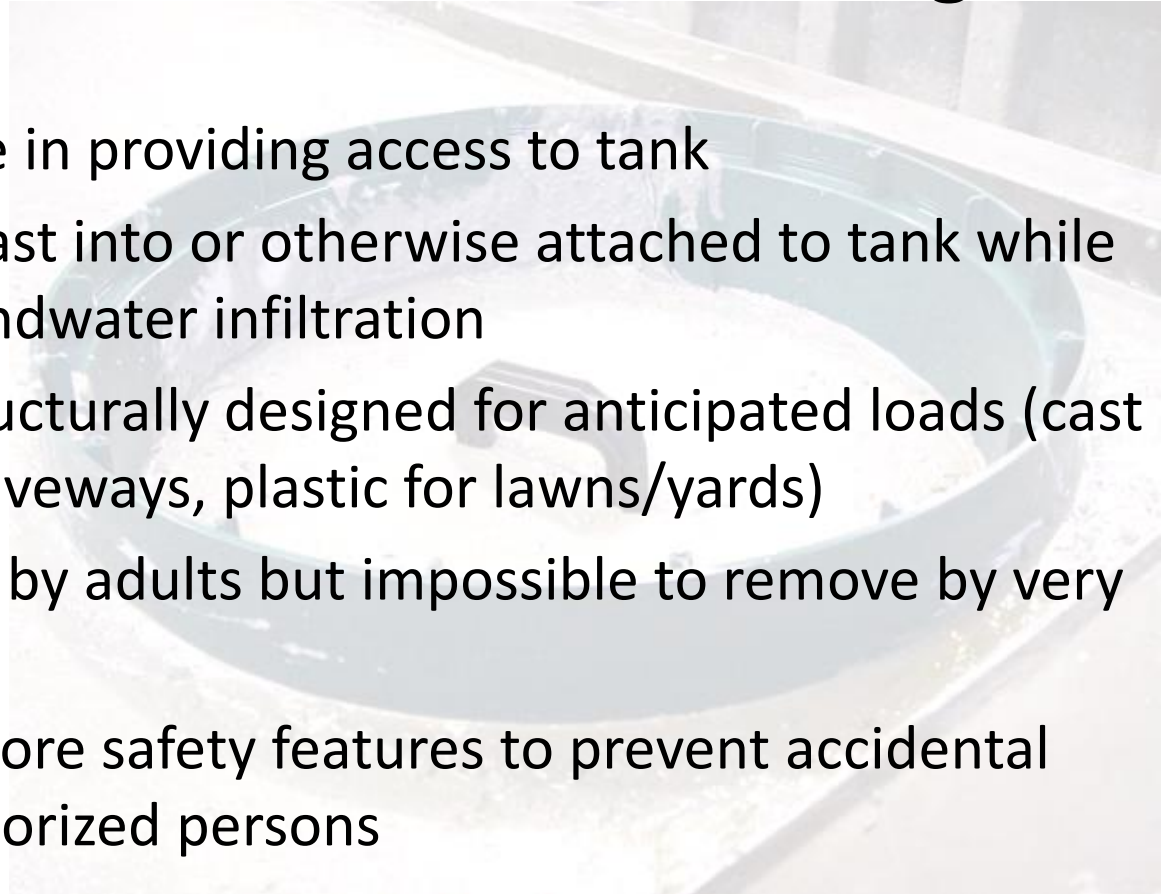
## Emphasis on Tank Access

- Regulators pushing to have tanks pumped regularly
- Access to outlet effluent filters necessary
- Access to effluent pump stations required
- Extension of water tight manhole risers to grade required to facilitate servicing
- ***Tank manhole extensions and lids can be a safety hazard if not designed and installed properly***



## Proper Tank Manhole & Lid Design

- Must be effective in providing access to tank
- Required to be cast into or otherwise attached to tank while eliminating groundwater infiltration
- Lid should be structurally designed for anticipated loads (cast iron for roads/driveways, plastic for lawns/yards)
- Easily removable by adults but impossible to remove by very young children
- Employ one or more safety features to prevent accidental access by unauthorized persons



# Common Lid Safety Attachment Methods

- ASTM requires lids to weigh 59 LBS or be provided with a locking system
- Double safety of heavy concrete lid with mechanical attachment of plastic lid



# Concrete Plug





# Common Lid Safety Attachment Methods

- Physical device using a lock & key
- Multiple covers to prevent unwanted access
- A combination of multiple screws/bolts with non-standard screw/bolt heads



# Common Lid Safety Attachment Methods

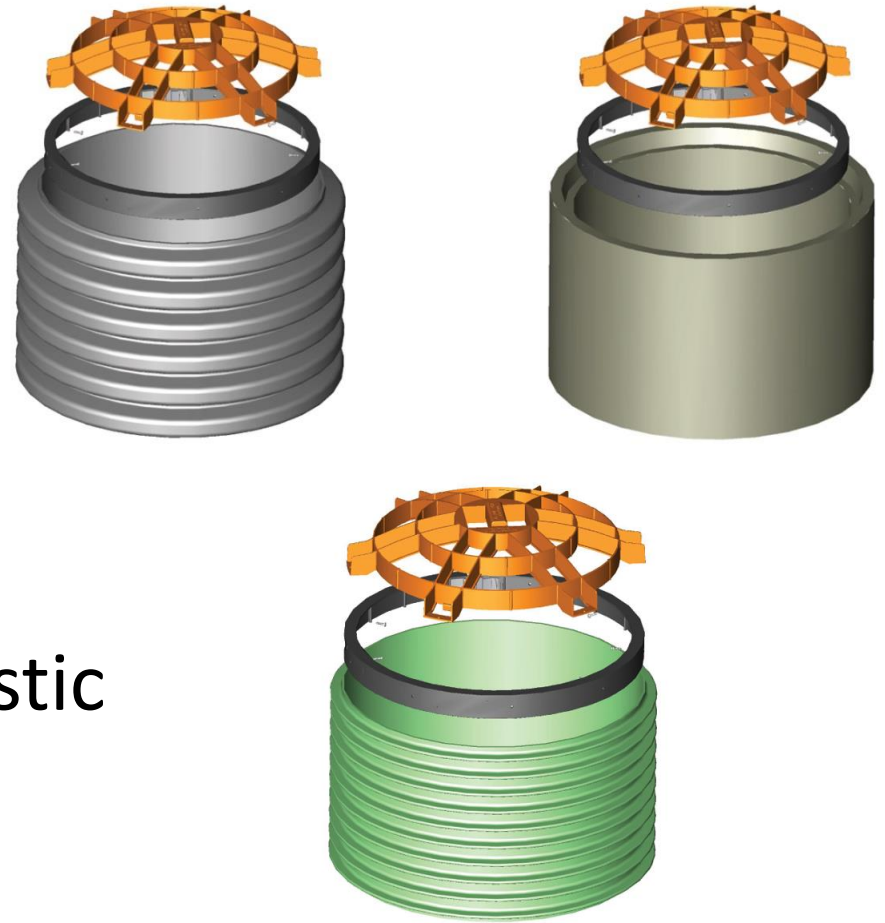
- Several manufacturers have created an interior safety mechanism to prevent unwanted tank entry.
- Some are plastic, rope, metal, etc.





# Universal Safety Screens

- Standard US sizes
- Canadian IPEX
- Concrete Risers
  - PVC Ribbed Pipe
  - Dual Wall Pipe
- Any manufacturer's plastic riser...No Excuses!!



## Secondary Apparatus



# Why Care About Tank Lid Accidents?

- In the event of accidental death or injury, it is likely the installer, cleaner, system designer and product manufacturers will be dragged into a law suit
- But more importantly, it's the right thing to do!

# What Can You Do to Promote Safe Tanks and Lids?

- Check out the products you purchase to make sure they are constructed well and provide the protection necessary to prevent tank/lid collapse or accidental entry.
- If you are getting a “super deal” on a tank, lid or locking system, it just may be worth much less than what you paid for it! (your attorney won’t mind)
- Stick with precasters and product manufacturers that have a proven sales/product record. If they are still in business after 10-20 years, it is probable their products are safe.
- Remain active in professional installer/cleaner organizations because they share current information on products and work with members to avoid accidents or defective products.



Thank You

Questions?





*For More Information...*

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