

Tales from the Tank

Analyses of Site Inspections



*Maine Center for Disease
Control and Prevention*

*An Office of the
Department of Health and Human Services*

Paul R. LePage, Governor

Mary C. Mayhew, Commissioner

Spring 2012

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Division of Environmental Health

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Site #1

Alleged Illegal Septic System, Grange Hall & Library

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Alleged Illegal Septic System, Grange Hall & Library

A complaint was received from an abutting property owner that the septic system serving a Grange Hall and a library was illegal because:

- no permit was issued,
- the library was illegally tied into the Grange Hall system, and
- the system was too close to the abutter's property.



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Alleged Illegal Septic System, Grange Hall & Library

A record search was done and a permitted HHE-200 was not found for either structure.

Portions of the system were excavated and the system was found to be in compliance with today's standards, for the Grange Hall use. The library was hooked into the same septic system.



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Alleged Illegal Septic System, Grange Hall & Library

Since a design for neither building was found, an SE will create an “as built” design for the Grange Hall and design a system for the library using first time system criteria.

Both of these designs will be permitted at an after-the-fact double permit fee pursuant to the Rules.



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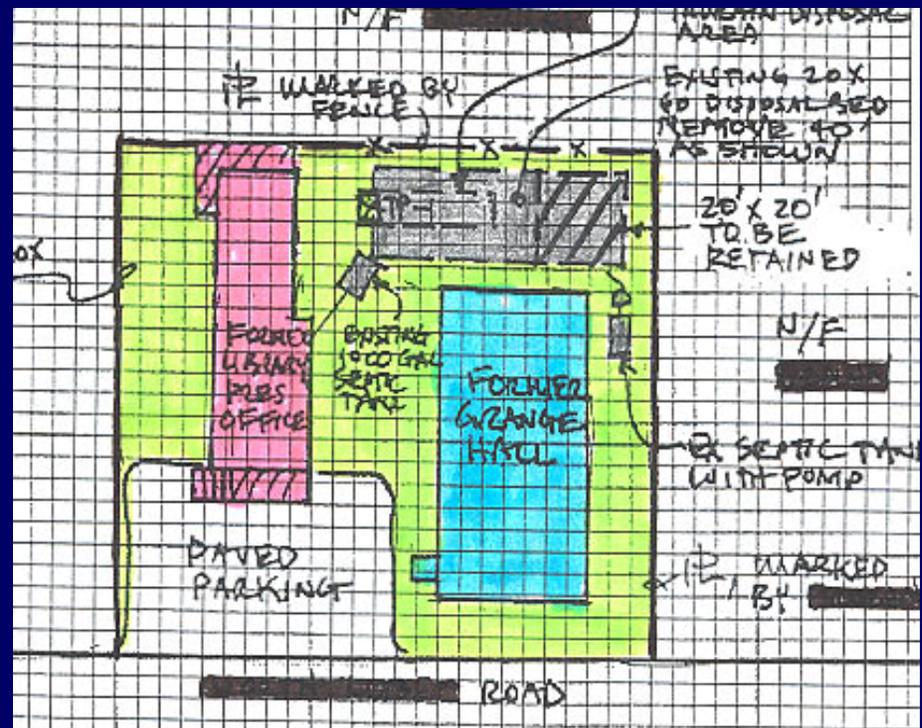
Alleged Illegal Septic System, Grange Hall & Library

Conclusions:

The original system was illegal because it was installed without a design or a permit.

The original system fortunately met the requirements for the Grange Hall.

A larger system was needed to accommodate both structures, and one was designed.



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Site #2 Residential Chamber System Malfunction

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Residential Chamber System Malfunction

The disposal field serving a duplex dwelling was malfunctioning with effluent on the ground surface at the lower rows of a plastic chamber disposal area.

The system was installed in 2005. The house was not occupied for two years, after which the system had been in use for three years.

The system was designed for 6 bedrooms at 540 gpd and met the requirements of the Rules at the time of design, particularly septic tank sizing.

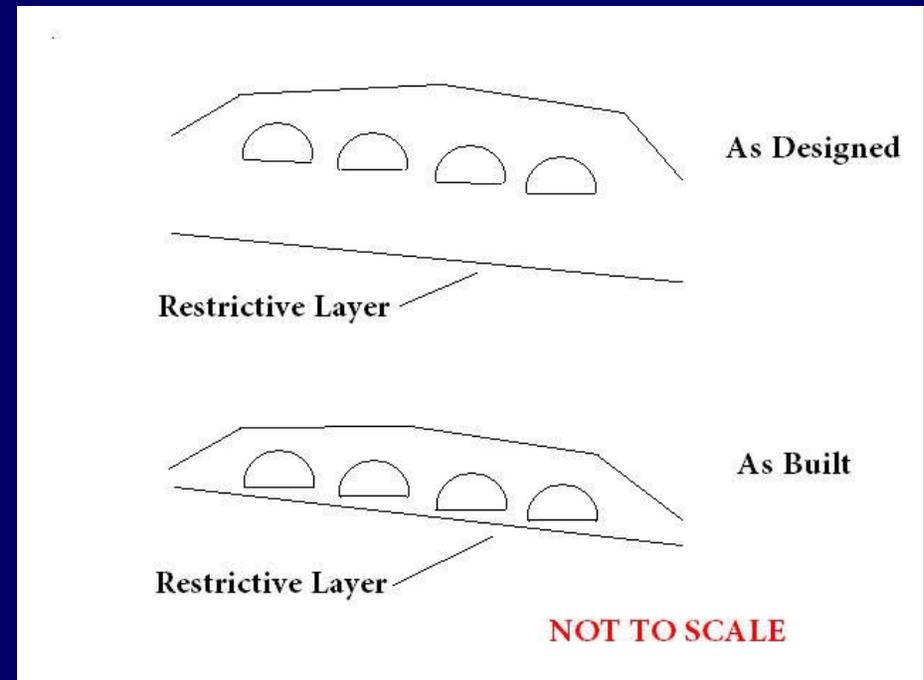
At the request of the LPI an inspection of the subsurface wastewater disposal system was conducted by Division staff and interested parties.

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Residential Chamber System Malfunction

The cross section of the disposal area design (plastic chambers) showed 19 to 22 inches of Rules-compliant backfill material under the chambers.

As built, the soils under the chambers were comprised of an inch or less of gravelly coarse sand over a firm, very fine sandy loam to silt loam.



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Residential Chamber System Malfunction

Conclusions:

Soil conditions below the chambers did not allow infiltration. This and insufficient fill led to ponding in the disposal area and a hydraulic break out.

Solids carry over from the tank were observed. The 6 bedroom duplex had one 1500 gallon tank, which led to the carry over.

The malfunctioning disposal area had to be replaced as it was too close to a limiting factor and had been sealed at least in part by solids carry over from the septic tank.

The Division recommended that a new disposal area be designed and installed.

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Site #3

Prematurely Malfunctioning Residential System

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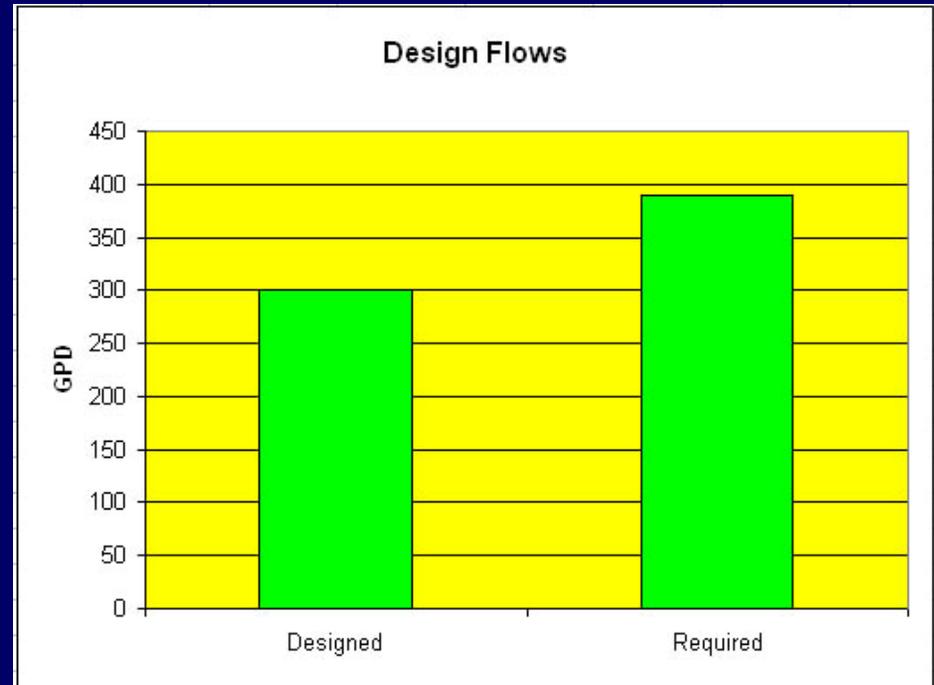
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Prematurely Malfunctioning Residential System

A complaint was received that a system serving a three bedroom residence was malfunctioning after only 1 ½ years of use. The system actually served a three bedroom dwelling with a one bedroom apartment.

The HHE-200 Form for the system had a design flow of 300 gallons per day (gpd) for a two bedroom house and one bedroom apartment, whereas a design flow of 390 gpd was required (270 + 120).



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Prematurely Malfunctioning Residential System

Division staff performed a site inspection accompanied by the LPI, the SE, and the owner.

Three test pits were dug by hand, one on top of the system, one on the side of the system and one about 10 feet off the southeast corner of the system.



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Prematurely Malfunctioning Residential System

Effluent was found ponded to the top of the stone layer, indicating inability of the bed to drain.

It was determined that the fill material under the chambers did not meet the requirements of the Rules and was the major cause of the malfunction.



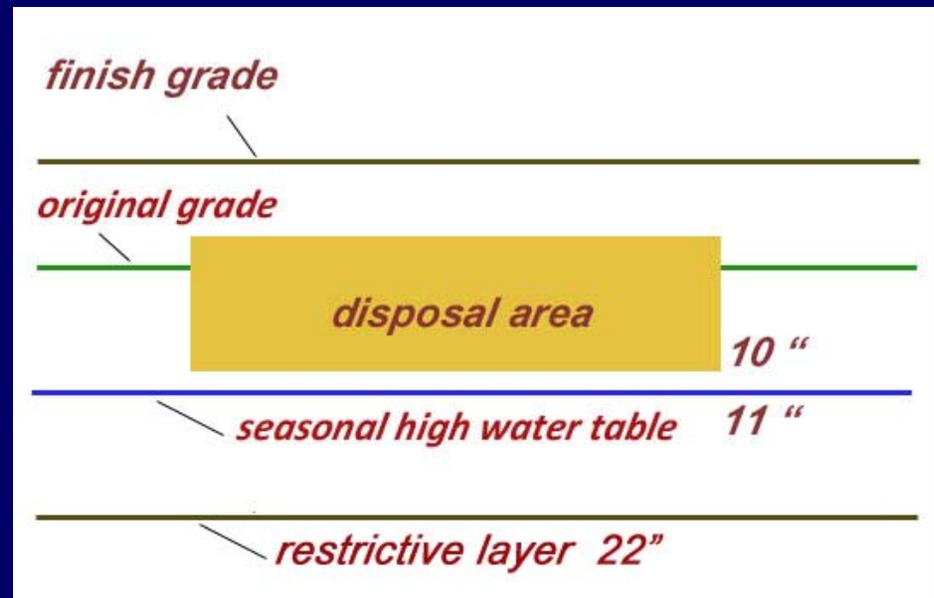
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Prematurely Malfunctioning Residential System

Soils were gravelly sandy loam with a seasonal high water table at 11 inches and free water at 15 inches below grade.

The HHE-200 Form indicated a restrictive layer at 22 inches and made no mention of the seasonal water table.

The design showed a 10 inch cut into native soils, placing the bottom one inch above the seasonal high water table.



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Prematurely Malfunctioning Residential System

Conclusions:

The disposal area failed due to a combination of unsuitable fill material, inadequate separation from the seasonal high groundwater table, and being overused by the owner with respect to its design flow.

The Division advised the owner to install a properly sized new disposal area at the proper elevation from the seasonal high water table.



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Site #4

Engineered Restaurant System Malfunction

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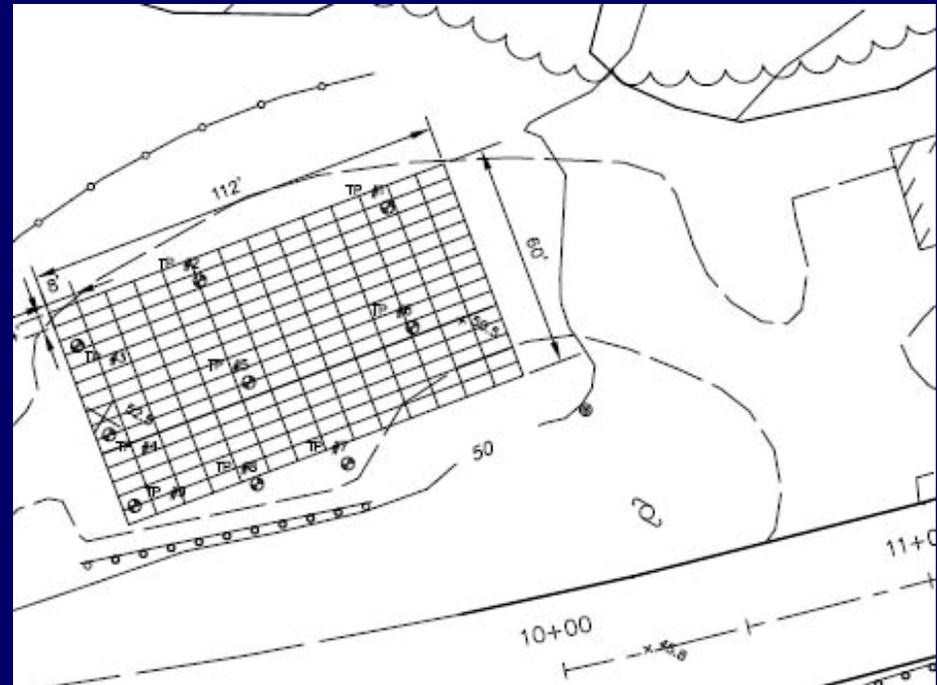
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Tales from the Tank

Engineered Restaurant System Malfunction

The Division received several e-mails in one day last August, alleging that an engineered system serving a restaurant had malfunctioned.

Division staff from SWU and HIP performed a same-day site inspection in response to the complaints, due to the potential for an imminent public health hazard.



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Engineered Restaurant System Malfunction

The system was designed as a 2,000 gpd replacement system.

An ATU was installed in the system without its remote monitoring system. Thus the ATU operated below specs with solids carry-over without anyone knowing.

There was no sign of hydraulic malfunction during the inspection. However, effluent could be seen sputtering around the seam of the distribution box lid.



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Engineered Restaurant System Malfunction

The design engineer proposed to divert 100% of the flow to the original disposal area for an indefinite period. This was to allow the new disposal area a chance to rejuvenate itself and accommodate metabolizing the solids in the disposal area.

The Division approved this proposal for a period not to exceed 30 days, at which time an assessment of the situation would be made.



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Engineered Restaurant System Malfunction

In the event of a malfunction of the original disposal area during this 30 day period, hydraulic or otherwise, use of that system was required to cease. In such an instance, all effluent was required to be routed to the new disposal area.

Weekly inspections and reports were conditions of the approval.

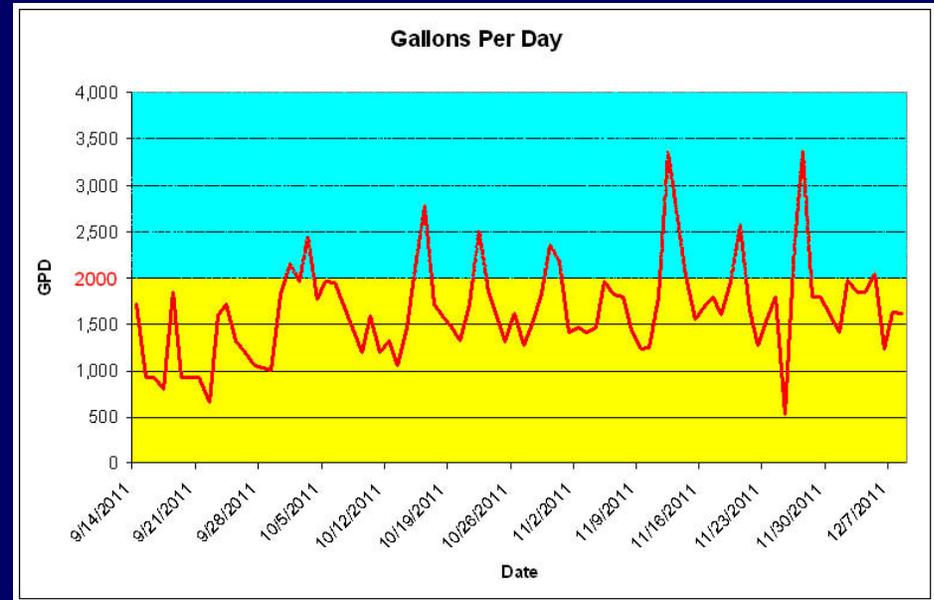


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Engineered Restaurant System Malfunction

Effluent was diverted to the original disposal area intermittently over the next few months, typically during weekends when the restaurant was generating peak flows. This was contrary to the approved proposal.

According to the weekly reports which the design engineer had been submitting, the restaurant had generated more than 2,000 gallons per day on several of these weekends.



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Engineered Restaurant System Malfunction

In December, the LPI discovered a hydraulic malfunction (breakout) at the original disposal area. The LPI contacted the Division immediately with photos.

On the basis of the malfunction, the Division rescinded approval for use of the original disposal area and restricted use of the new disposal area to 2,000 gpd.



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Engineered Restaurant System Malfunction

Weekly reports filed since the malfunction of the original disposal area show that the system use has not exceeded 2,000 gpd. In several instances this required pumping out the system before a peak flow was expected.

If this system fails, it will need to be replaced. Given space limitations it would likely be *in situ*.



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Engineered Restaurant System Malfunction

Conclusions:

The system faced two major obstacles to proper functioning:

- (1) improper installation of the ATU with resulting solids carry over and
- (2) chronic and extensive over use of the system by the owner.



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Site #5

Engineered Commercial Laundry System Malfunction

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Engineered Commercial Laundry System Malfunction

An LPI found that a commercial laundry's system was malfunctioning, clearly evidenced by effluent flowing on the ground surface.

The laundry operator had begun accepting laundry from several nearby summer camps. The increased use of the system strained it to the point of hydraulic malfunction.



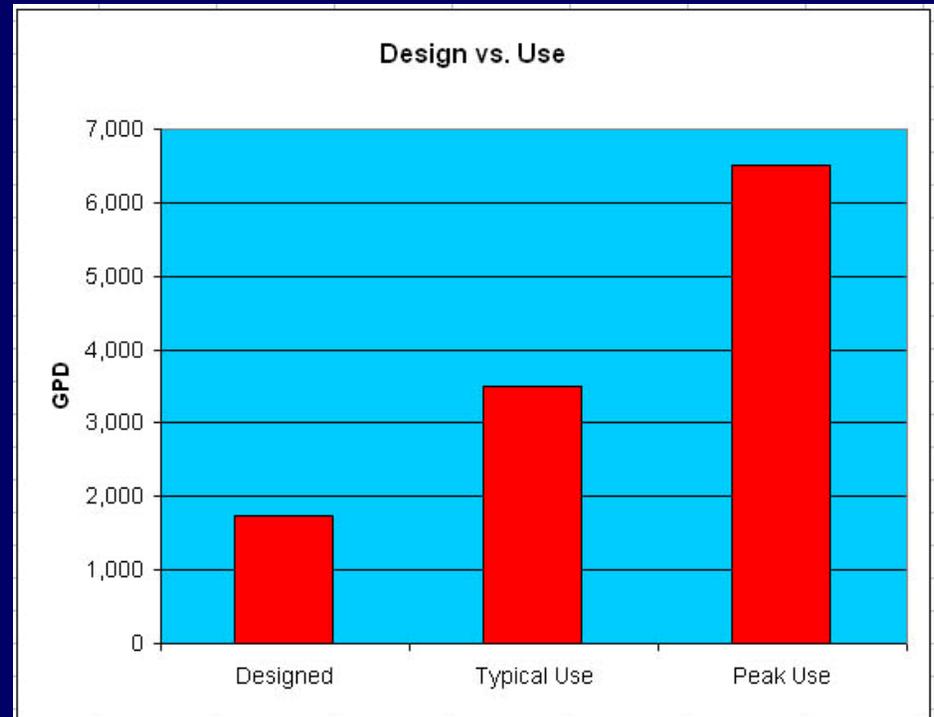
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Engineered Commercial Laundry System Malfunction

The original system was designed for 1,730 gpd.

Typical use by the owner of the laundry was 3,500 gpd, slightly more than 200% of the design flow.

Peak use for the summer months was 6,500 gpd, or 375% of the design flow.

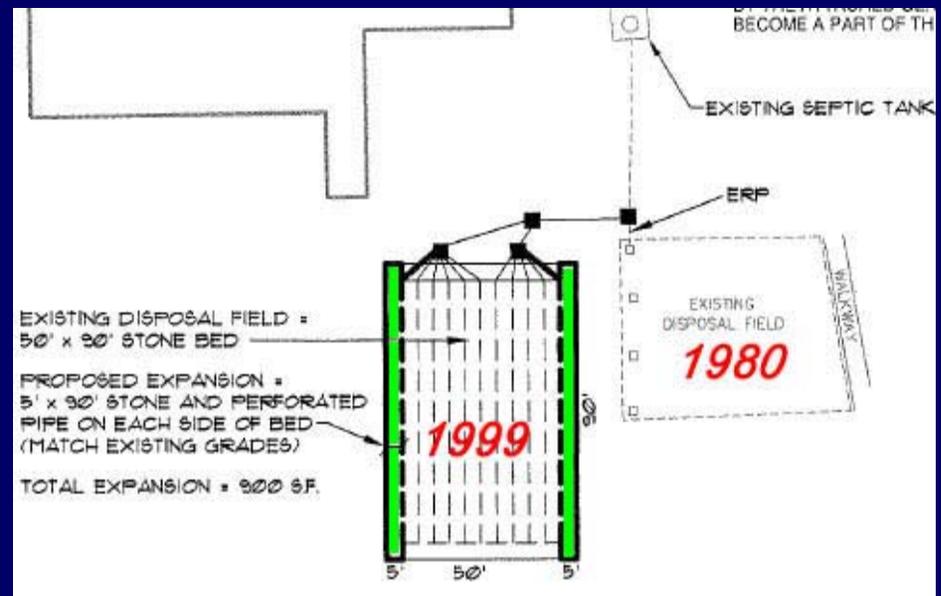


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Engineered Commercial Laundry System Malfunction

The original system included two disposal areas known as the 1980 bed and the 1999 bed. It was the 1980 bed which had malfunctioned.

The owner's engineer proposed to the LPI adding stone trenches abutting the 1999 disposal area as a stop gap solution. At that time the LPI asked the Division to review and comment on the proposal.



Tales from the Tank

Engineered Commercial Laundry System Malfunction

The Division determined the malfunctioning laundry system represented a clear danger to the public health, particularly with respect to potential transmission of pathogens. It had to be addressed in a timely manner.

However, the owner resisted repair or replacement of the malfunctioning system, claiming that the cost of doing so would put him out of business.

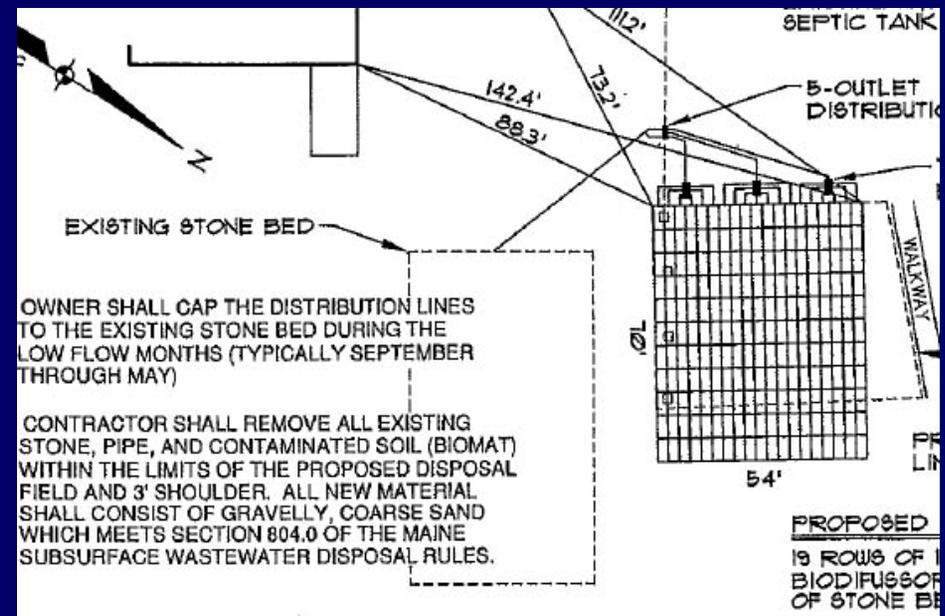
The Division was not persuaded by this argument. The mission of the Department, and by extension the LPI, is to protect the public health, not to accommodate continued use of failing and inadequate infrastructure because an owner alleges failure of the business will result due to costs if the failing infrastructure is repaired or replaced.

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Engineered Commercial Laundry System Malfunction

The engineer subsequently proposed to discontinue use of the so-called “1999 bed” during non-peak use to allow it to “rest”, and that during June, July, and August of each year, it would be reactivated in tandem with a new replacement chamber area where the 1980 bed was located.

The owner submitted and the Division approved this proposal for a replacement engineered disposal area.



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Site #6

Multiple Use Commercial System Malfunction

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Multiple Use Commercial System Malfunction

USEPA forwarded a complaint to MDEP, who forwarded it to DEH. The complainant alleged that a septic system serving a multiple use commercial property was malfunctioning and discharging to a regulated wetland.

The property was comprised of a doughnut shop, a sandwich shop, a limited menu eating place, and 2 residential apartments in a relatively recently replaced structure.

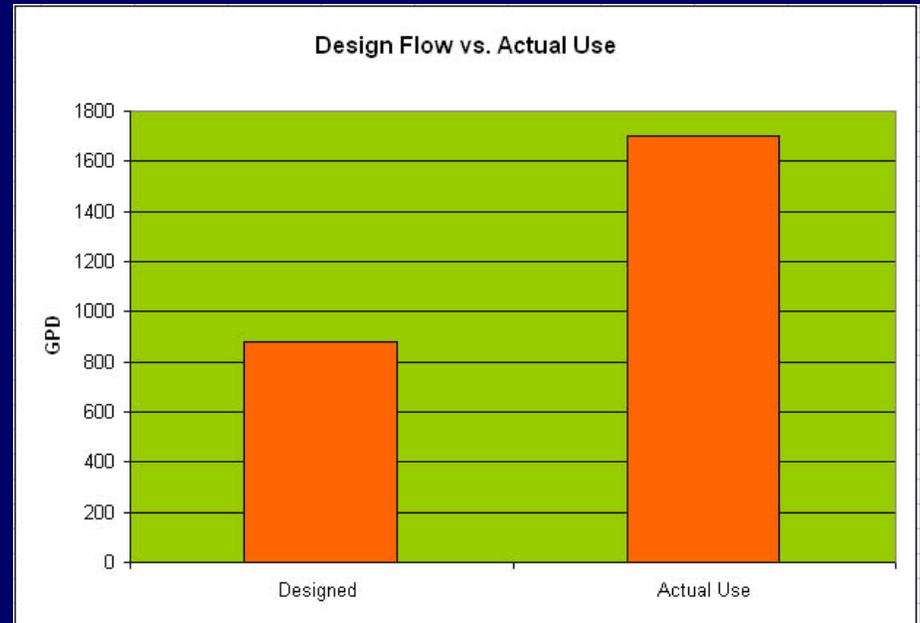


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Multiple Use Commercial System Malfunction

The system that served the prior building malfunctioned in 2005 and was replaced with the subject system, designed for 880 gpd for a doughnut shop with 15 seats, 10 office workers and takeout sandwich shop.

The owner stated that the water meter indicted water usage at about 1700 gallons per day.



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Multiple Use Commercial System Malfunction

DEH staff inspected the site along with interested parties. The system was malfunctioning, as effluent was observed exiting a vent pipe.

The owner's SE found that the grease trap had been piped incorrectly allowing grease to enter the pump station and then directly into the disposal field.

The system stopped malfunctioning after the grease trap was cleaned and re-piped, and the tank was pumped.



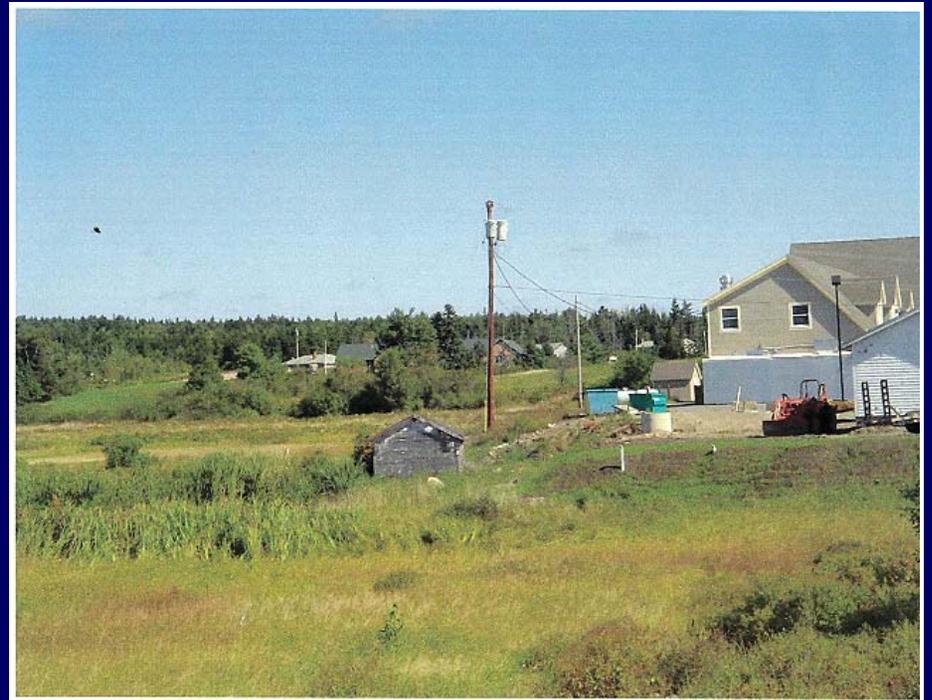
Tales from the Tank

Multiple Use Commercial System Malfunction

Staff inspected inside the building and found a water purification system for removal of iron from the water source.

The system backwashed daily and discharged approximately 150 gallons per backwash cycle to the septic system.

This was not included in the system's design flow.



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Multiple Use Commercial System Malfunction

The owner was willing to install a public force main and grant the municipality an easement for a future pump station in his parking lot, if the municipality would let him tie into a public sewer that was approximately 1,100 feet from the property.

A potential route for a force main was found in a disused railroad right of way controlled by the Maine DOT and DOC, which had recently been graded and graveled.

The proposal for installation of the force main and connection to public sewer at the owner's expense was denied by the municipality. This left the owner with few alternatives.

Tales from the Tank

Multiple Use Commercial System Malfunction

The well for the facility is located in the northeast parking lot as shown on the SE's design, less than 300 feet from the proposed system.

The SE suggested relocating the backwash from the water purification system to its own disposal system to reduce the flow to the disposal system. This would have required a DEP license.

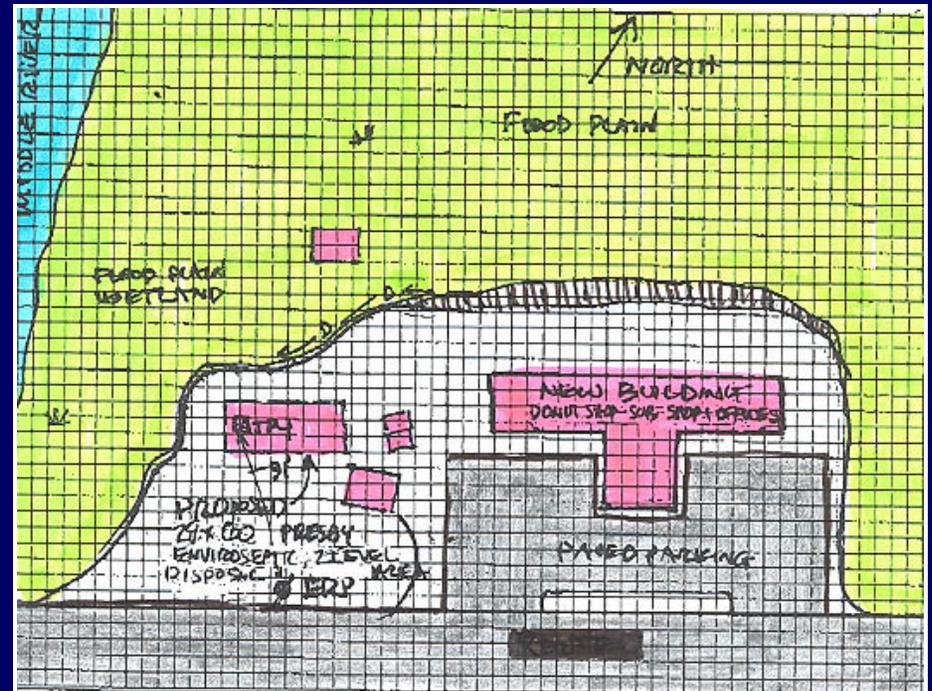


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Multiple Use Commercial System Malfunction

The practical alternative in this case was connection to the public sewer. Since the municipality declined the owner's proposal to connect an onsite system was chosen.

Given the lot size and site limitations, an in situ disposal area was the only option. The SE created a replacement system design requiring several variances which the Division reviewed and approved.



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Site #7

Multiple Agency Investigation of a Water Borne Hepatitis A Outbreak

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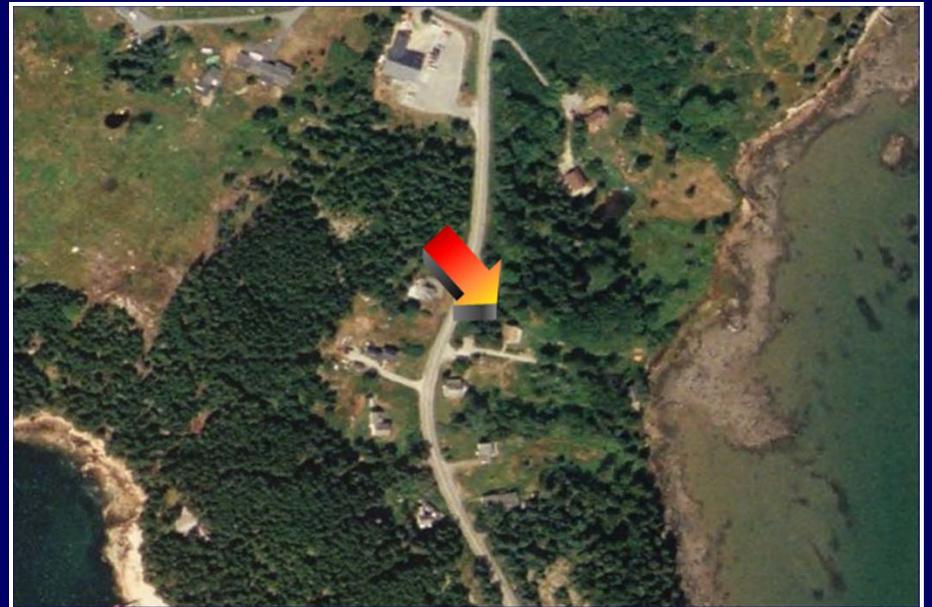
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Response to an Outbreak of Hepatitis A

Nine individuals associated with a private seasonal residence were diagnosed with HAV between July 6, 2009 and September 2, 2009. One fatality was associated with this residence-the first reported case.

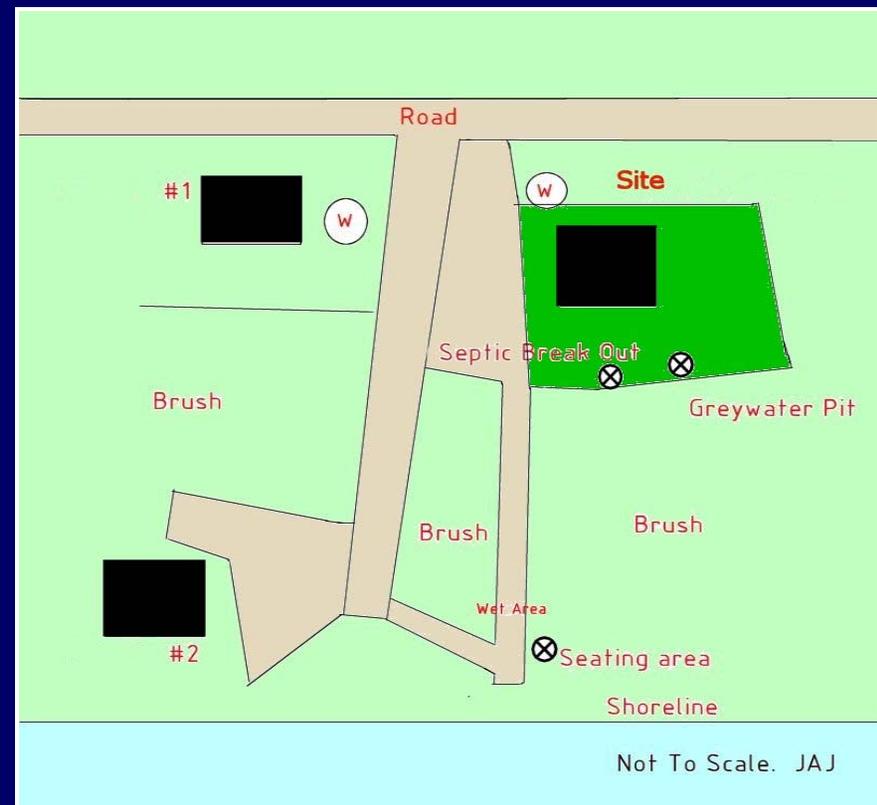
The Division of Environmental Health was made aware of this outbreak on August 26, 2009.



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Response to an Outbreak of Hepatitis A

A site inspection was performed at the subject property on August 27, 2009. Present were staff from the Department of Marine Resources and the Division of Environmental Health, Subsurface Wastewater Program, two abutters, the Local Plumbing Inspector, the Town's Emergency Management Director, and the First Selectman.



Tales from the Tank

Response to an Outbreak of Hepatitis A

Staff discovered that the drain line from the laundry room and kitchen sink had been cut, and the stub to the building drain had been capped. The greywater drain was connected to a black polyethylene pipe.

This polyethylene pipe extended to a hole in the ground covered by two rocks and a piece of pressure treated wood, comprising an illegal, nonconforming greywater disposal pit.



Tales from the Tank

Response to an Outbreak of Hepatitis A

There also was evidence of an ongoing malfunction of the main disposal area, evident by a black, very wet area adjacent to an area overgrown with brush.

The coloration suggested this was a chronic condition. The outbreak was set back +/- 200 feet from the normal high water mark of the cove and +/- 127 feet down slope from the property's well.



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Response to an Outbreak of Hepatitis A

Water samples from the dwelling were delivered to the DHHS Health and Environmental Testing Laboratory. DMR staff sampled the effluent and sent it to the CDC in Atlanta.

The water was positive for E. coli and the effluent was positive for Hepatitis A.



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Response to an Outbreak of Hepatitis A

The first person diagnosed had the disease upon arrival at the property, and did not acquire it onsite.

The property owner's septic system was malfunctioning, and the greywater disposal pit did not conform to the Rules.

The water supply to the dwelling was contaminated with bacteria and Hepatitis A virus., via the inadequate and illegal wastewater disposal methods.

The illness transmission associated with this situation was avoidable!

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The End

The screenshot shows a Mozilla Firefox browser window displaying the website for the Subsurface Wastewater Unit, Division of Environmental Health, Maine CDC. The page title is "Subsurface Wastewater Unit, Division of Environmental Health, Maine CDC - Mozilla Firefox". The address bar shows the URL: www.maine.gov/dhhs/mecdc/environmental-health/plumb/index.htm. The page content includes a navigation menu with links for "Maine CDC Home", "Health Topics A-Z", "Data/Reports", "For Health Care Providers", "For Businesses", "For Homeowners/Renters", and "Divisions/Programs". The main heading is "Maine Subsurface Wastewater Unit". The text describes the unit's role in regulating septic systems in Maine, mentioning the Maine State Plumbing Code and the Maine Center for Disease Control and Prevention (MeCDC). It also includes a "What's New at the Subsurface Wastewater Unit" section with links to "Family Burying Grounds", "Fillable Online HFE-200 Page One Available", "Elimination of Permit Labels", "Health Inspection Program Holding Tank Policy", and "Recently Approved Products". A "Featured Links" section lists various resources like "Online Rules", "Variances", "Site Evaluator Licensing", "Frequently Asked Questions", "Ten Tips for Systems", "Cemeteries and Crematoria", "Certifications", "Public Swimming Pools", and "2001 DHS & DEP Programs Review". The page also features a "Social Services Help" logo and a "Page Tools" dropdown menu.

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