

Common Abutter Concerns About Natural Burial

Among the most frequently cited concerns of abutters when faced with the possibility of sharing a border with a natural cemetery are water quality, animal disturbances, and land values. There are also issues with road use, parking, and visitor traffic management. Here are some descriptions of these concerns with links to deeper dives into the science and law. For a one-page overview, see [Real Answers to Questions Real People Ask About Green Burial](#).

In a nutshell, natural burial:

- Follows all required state laws for reporting and for distances from water, buildings, and highways.
 - Does not use concrete vaults, metal or rainforest hard wood caskets, or chemical embalming.
 - Promotes the use of locally made biodegradable caskets and shrouds.
 - Has individual graves that are the same or larger than conventional ones.
 - Encourages family, friend, and community participation.
 - Includes all military honors and religious traditions.
 - Buries at the legally acceptable depth for optimum soil conditions.
 - Memorializes with flat markers and gravestones, and often smartphone-accessible memorial features.
 - Uses GPS pins and coordinates to enhance accurate cemetery record keeping.
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Water Quality

Authority

All the authority rests in local government or groups of people dedicated to maintaining the highest standards and best practices available to them. State government sources confirm that there are only a handful of laws in a few states that exhibit concern for water beyond best practices already in place through Departments of Health or Environmental Services. What laws that do direct cemetery governance, including burial depth and setbacks from known water, buildings, and state highways, are meant for all cemeteries, whether they require a vault or not. *No state requires the use of a vault.*

Sources of Pollution

Any pollution from cemeteries is caused by casket hardware, embalming fluids, herbicide and pesticide use, and fertilizer run-off into waterways. Cemetery plume caused by leachate is attributable to what goes in the grave, not the body. It is comprised of metals, irons, and wood finishes from the casket, and embalming chemicals that include methanol, surfactants, humectants, benzene, and other toxic agents.^[1]

Nitrate Load

Dr. Helen Dawson, senior hydrologist with Geosyntec Consultants, states clearly that: 1) the type of pollution, specifically nitrate presence, is similar to septic and farming contamination but in significantly different proportions, 2) depth, soil type, and climate determine contaminant attenuation, 3) agricultural use of land releases 100 times more than 1 burial on that land; septic expulsion accounts for 200-400 times per day the amount of one burial, one time; the nitrate load of a cemetery is fractional in comparison.^[2] *We flush more than 20 times as much fluid everyday than is in one body. One body's soft tissue will decompose over a period of 4 to 6 weeks, releasing about 12 gallons of moisture total. The average family of four flushes 250 gallons of water every day.*^[3] *"Drinking water with levels at or below 10 milligrams per liter are safe for everyone."*^[4] *A Minnesota Department of Health report states that the acceptable range of nitrates in water is between 0 and 10 milligrams per liter. Average drinking water with no apparent risk, naturally has 3 milligrams per liter or less.*

Conservation level burial grounds have a significantly reduced carrying capacity, or number of burials permitted per acre, that further reduces risk. A typical conventional cemetery buries 1,200 to 1,500; a natural cemetery only 300 to 400.

Groundwater

Groundwater is not at risk when burials are situated outside common sense setbacks. A 50 foot distance between a grave and known water source is considered sufficient, though few states (6) or local ordinances state any setbacks at all. The chief concern of fluid release from a corpse is ammonia, which changes to become nitrates, which are then filtered through soil. However, studies have shown conclusively that bodies in cemeteries do not present a risk to ground water deeper than 4 feet from the bottom of the body, nor do the fluids have the ability to spread laterally for any significant distance, or uphill.

How quickly any remaining viable bacteria could theoretically get down to the ground water would also depend greatly on the type of soil. Clay particles are about 1/1000th the size of sand grains. Not surprisingly, water filters through this type of strata very slowly, giving the bacteria plenty of time to run its course and die before reaching water.

One mitigation technique used is to line the bottom of the grave with absorptive organic material that wicks the leachate away from the body and sequesters much of it, making it readily available for microbial consumption and molecular mitigation. [*Attributed to Dr. Billy Campbell, Ramsey Creek Preserve, Memorial Ecosystems.*]

Aquifers

Aquifers are not in danger. Ground water would have to filter through at least 80 to 100 types of soil to reach an aquifer, naturally making it potable.

What Vaults and Caskets Do Not Do to Protect Water Safety

When considering whether natural burial is a threat to water, a little history is helpful. Contrary to popular belief, vaults were designed not to protect bodies from polluting but to keep the “zombies” in and the “ghouls”, or graverobbers, out. Likewise, embalming has no public safety properties; it was developed as a short-term preservative to return Civil War soldiers north.

Caskets and vaults are not leakproof. Rubber gaskets age and shrink and concrete cracks 100% of the time. Anyone who is concerned about water quality and cemeteries needs to understand that what happens in a grave happens regardless of what the body is encased in, albeit at different timetables and with markedly different aerobic (natural, unimpeded decomposition) and anaerobic (with impediments to air, water, and microbial activity) results.

[1] Dawson, Dr. Helen, Senior Principal, Geosyntec Consultants, Inc. Washington, DC. *Rebuttal Report in the matter of the Application of Reflection Park, Inc., for a Conditional Use for a Cemetery*, March 28, 2022.

[2] Webster, Lee. “The Science Behind Green Burial” from *Changing Landscapes: Exploring the growth of ethical, compassionate, and environmentally sustainable green funeral service*, 2016.

[3] Minnesota Department of Health. *2020-2022 Nitrate Annual Report: Community*

Public Water Systems, September

2024.<https://www.health.state.mn.us/communities/environment/water/docs/contaminants/nitrpt20202022.pdf>

[4] Impact of cemeteries in groundwater contamination by bacteria and viruses – a review, Zychowski, J., Bryndal, T. *Journal of Water and Health*, 2015, 13 (2): 285-301

Animal Disturbances

There hasn't been any animal disturbance reported in more than 25 years in the US and longer where it is common around the rest of the world, other than noting that in some locations skunks arrive occasionally looking for grubs in the freshly turned soil. Even if animals could smell something 3.5 - 4 feet deep that provides a substantial and effective 18-24-inch smell barrier, they would likely not be interested. Animal scientists are pretty clear that wild animals are more interested in prey above ground than digging that hard for a buried human who most animals are conditioned to fear and keep distance from. Even most species of bears rarely attack humans in the wild unless given reason. Few animals of any kind are equipped to dig deeper than 12 inches, and that likely will be deterred when it hits human scent.

Property Values

Although there are some potential buyers of private property that abuts land used for burial who are uncomfortable with the idea, real estate professionals report that it is only one of a myriad of factors that influence the decision to buy or not to buy.

Real estate business Redfin reports that, "The numbers indicate that on average, homes near cemeteries are slightly smaller, but sell for more per square foot...On average, homes closest to cemeteries sold for \$162 per square foot, whereas homes located more than 500 yards away sold for \$145 per square foot." They do note that homes tend to stay on the market longer before selling. Homes less than 50 feet away from cemeteries took 48 days to sell, whereas those located more than 500 yards away took 39 days to sell, on average. [From *I See Dead People: Do Homes Near Cemeteries Sell Well?* by Christin Camacho, October 2013. No longer in print.]

There is no evidence that having a natural cemetery near or abutting land affects the asking price in any way. Anecdotal reports seem to favor the idea that a quiet neighbor is a good neighbor. And neighborhoods that have well-maintained recreational trails tend to improve real estate values of adjacent properties. Check out the pros and cons, plus their take on the changing aesthetic that is going to impact the desirability of property near cemeteries at [Fast Expert](#).

Disease Pathogens

It has also been concluded through studies conducted throughout the world, particularly in disaster zones with mass deaths and burials, that pathogens are not generally a present danger. In fact, at least one study makes a point of saying that it's the responders who carry germs that can cause health issues on site. Pathogens here in the US are very limited (*see slide*). Preferred methods of disposing of bodies infected with Ebola and Creutzfeld-Jakob Disease around the world is burial without a vault. Hepatitis B's pathogenic risk lasts about 7 days, and then, as with the rest of the bacterial world, once the host has died, the bacteria or virus does as well, usually within 12 – 24 hours.

Here is what some internationally recognized health experts say about transmission of disease from a dead body:

- *"...concern that dead bodies are infectious can be considered a 'natural' reaction by persons wanting to protect themselves from disease" although "the risk that bodies (that died in a natural disaster) pose for the public is extremely small." —Pan American Health Organization (PAHO)*
 - *"Transmission of infection requires the presence of an infectious agent, exposure to that agent, and a susceptible host... The human body is host to many organisms, only some of which are pathogenic. When the body dies, the environment in which pathogens live can no longer sustain them. Microorganisms involved in the decay process (putrefaction) are not pathogenic..." —PAHO*
 - *Once a human dies, infectious agents that would be of any concern, including those on the individual's skin or internal organs, is greatly diminished...there simply is no measurable risk of that body transmitting an infectious disease agent..." —Dr. Michael Osterholm, Center for Infectious Disease Policy and Research (CID)*
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Parking and Traffic Management

Depending on where the cemetery is located, how much land is being used, and other conditions, it's difficult to estimate what the traffic will be for any average day, funeral service, weekday, weekend, or holiday. But we do have some research that helps us understand what to expect in terms of numbers for an average funeral service. Based on documented traffic counts from ten natural cemeteries in the central southeast, the typical number of burials ranged from between 15 to 50 a year. During those services, the number of vehicles ranged between 6 and 20, with an average of 10. The reported number of visitors to the cemetery stemmed from 1-5 people per day.

Infrequent special events will likely be attended by larger numbers. Planning parking for 200 attendees may be desirable. Traffic during larger events should be directed by staff to keep order and manage speed and parking location expectations.

Pharmaceuticals and Joint Replacements

Pharmaceuticals are filtered and mitigated by soil, absorbing nutrients and binding molecules. Over time, most drugs will either stay bound or be absorbed or changed, likely by fungal activity. It should be noted that most people who have died of anticipated deaths no longer have pharmaceuticals on board at the time of death.

The metals used in knee or hip replacements are not ones that leach—usually titanium—so we do not concern ourselves with invasive procedures to remove them. Reducing the environmental impact of concrete production, the carbon footprint of exotic wood harvested from the Amazon rain forest and transported to the American heartland for processing, and the importation of steel is enough to counterbalance burying an inert joint.

Structural Integrity of the Grave

People sometimes fear that standing next to the open grave during burial services, especially while lowering the body into the grave, may cause the ground to collapse and cause injuries. To avoid this possibility, a wide-planked platform is placed around the

open grave, preventing this type of collapse and providing safe footing for those who are lowering the casket or shrouding board.

Collapse of the grave itself is also not an issue. Shroud burials have no barriers to soil so there is no collapse. Pine casket or woven willow casket burial have little airspace compared to commercially manufactured hardwood containers. All soil removed from the grave is returned, providing a protective mound that simply settles over time. At no time is stepping on or around the grave a threat to public safety.

Resources

Websites

- Natural Burial New Hampshire <https://www.naturalburialnh.org>
- New Hampshire Funeral Resources & Education <https://www.nhfuneral.org>
- Funerary Artisans Collective <https://www.funeraryartisanscollective.org>
- Conservation Burial Alliance <https://www.conservationalliance.org>
- Green Burial Council <https://www.greenburialcouncil.org>
- Ramsey Creek Preserve <https://www.memorialecosystems.com>

Articles, Videos, Books

- Articles, videos, books describing the practice
https://www.greenburialcouncil.org/books_blogs_articles_videos.html
- Academic research papers and scholarly articles detailing how it is done
https://www.greenburialcouncil.org/books_blogs_articles_videos.html
- Academic research <https://www.greenburialcouncil.org/research.html>
- Photographic evidence of procedures
<https://www.greenburialcouncil.org/gallery.html>
- List of nearly 500 natural burial cemeteries in the US and Canada showing growth since 1997 <https://www.nhfuneral.org/green-burial-cemeteries-in-the-us-and-canada.html>
- Family information
https://www.greenburialcouncil.org/green_burial_guide_for_families.html

Courses

- **Opportunities in Green Burial**
<https://www.redesigningtheend.com/courses/opportunities-in-green-burial>
- **Burial as a Conservation Strategy** Free course for land trusts and landowners
https://www.redesigningtheend.com/courses/burial_as_a_conservation_strategy
- **Green Burial Masterclass** Paid certification course for natural cemetery operators
<https://www.redesigningtheend.com/courses/green-burial-masterclass>
- **Green Funeral Services** Paid certification course for funeral professionals
<https://www.redesigningtheend.com/courses/green-funeral-services>
- **Becoming a Hybrid Cemetery** <https://www.redesigningtheend.com/courses/becoming-a-hybrid-cemetery>

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