

Speed of Light?

The world of onsite treatment can learn lessons from Star Trek about the power of advances in technology

By Theo B. Terry III, R.S.

After leaving a committee meeting dealing with state regulatory changes, and while walking through an airport terminal, I passed a gentleman who simply touched an earpiece and was instantly connected with a phone call.

“How cool is that?” I thought. As I waited at my gate, then boarded my plane, it seemed most of the business people around me were similarly connected. This started me thinking: Technologies in other industries seem to go from concept to reality at lightning speed, yet the onsite industry seems to move at, well, the speed of sludge.

Future past

Was it really 30-odd years ago that *Star Trek* was a hit show? Creator Gene Roddenberry looked into the future and made impossibilities seem real. Remember those communicators that Captain James T. Kirk and the rest of his crew used to talk to one another? What seemed so futuristic then is almost backward technology today: Witness the flip phone.

In the late 1980s and early 1990s, *Star Trek: The Next Generation* showed advances with communicators built into one's everyday clothing. All Captain Pickard had to do was tap the communicator on his shirt to talk with someone. That's kind of like the man in the airport, only with today's rapid communications advances, it just took about 18 years to make the leap from fantasy to reality.

So why does it take so long for the

onsite industry to embrace new technologies? Some would say it's because our rules are prescriptive rather than performance-based. Others would say that the regulatory community has the upper hand in our industry, does not like change, and simply has no incentive to change.

I think the reason is more fundamental. I believe onsite rules are written with both prescriptive and performance-based standards, according to accepted, current technology. In other words, we write onsite regulations to fit what we know the technology can do, rather than what we can and should be doing, according to science. We lack vision.

Spacing trenches

One example is the spacing requirement for undisturbed soil between drainfield trenches. Most state codes

now call for six to eight feet of spacing. So where did this figure originate? The answer is simple: It's the distance needed to set backhoe stabilizers to dig a trench with a central boom.

But recent research by Dr. Larry West of the University of Georgia has

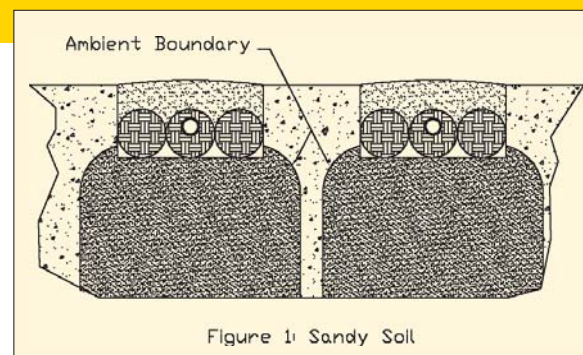


Figure 1: Sandy Soil

The ambient boundary concept indicates that drainfield trenches in sandy soils could be more closely spaced than trenches in clay soils.

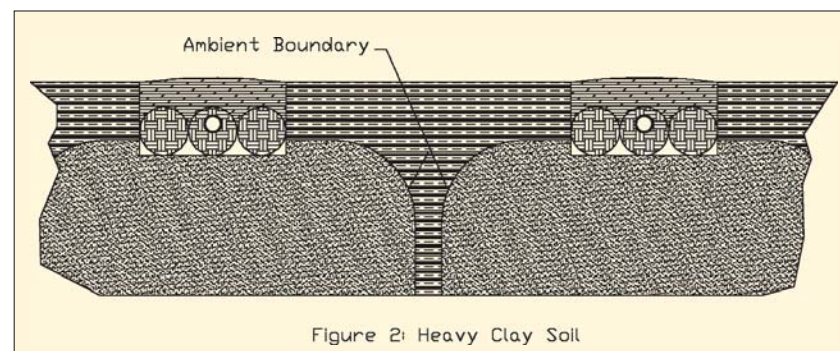


Figure 2: Heavy Clay Soil

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determined that this distance should vary, depending on soil type. He has identified an ambient boundary (AB), defined as the boundary beyond which the hydraulic effects of onsite wastewater additions to soil are not measurable. This boundary changes depend-

ing on the wastewater loading and ambient soil water potential.

Dr. West uses a great visual analogy to explain the appearance of the ambient boundary: “It is very similar to a hoop skirt — horizontal from the trench and then mostly vertical.” The lateral component is due to capillary gradient from dry soil away from the trench, and the vertical component is due to gravity.

In other words, the lateral movement of wastewater away from the trench is soil-dependent. It is less for sandy soils than for heavier clay soils. For clay soils, the trench spacing probably should be about six feet of undisturbed soil.

At the same time, based on the same concept, only about four feet of undisturbed soil should be needed between trenches for sandy soils.

How should this apply to the average homeowner or developer? In the late 1980s and into the early 1990s, a trend developed to make lots smaller. These lots were accommodated by reducing the linear feet of the drainfield: installing shorter, wider trenches, thereby reducing the drainfield footprint.

However, this trend led to some industry concerns: By reducing the linear length of drainfields, were we shortening their life expectancy? Although the debate over "long and narrow" versus "short and wide" continues, it appears that new research is leaning toward long and narrow. Today, with Dr. West's research indicating that we can space trenches closer together (at least in the majority of soil types), we can keep that footprint small without having to resort to short, wide trenches.

Perception and reality

That is, unless our industry continues to base regulations on perceptions rather than science. A member of a state regulatory committee recently commented in a meeting I attended that he didn't care what the science showed. Perceptions were that separa-

tion distances between trenches needed to be X number of feet, and therefore that should be the reality. What if that attitude carried over into other industries? We could still be talking on party lines, or maybe Dixie cups and string.

At another technical review committee meeting in a different state, a member said he did not want to change the regulations to allow trenches to be installed closer together, because he didn't want his customers to have to buy new equipment to install drainfields. Yet isn't that a decision for installers to make, based on how they can most effectively run their business? Remember, at one time, all ditches were dug by hand.

It's time for the onsite industry to move into the 21st century! Let's write regulations around scientific evidence and give our industry a target to aim for. Who knows? Maybe in a few years, equipment manufacturers will develop backhoes with two booms that can dig two parallel trenches in close proximity to one another. Then maybe our industry can truly go where no one has gone before.

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