

Allyson, Members of the Sustainability Board,

In preparation for the task that was assigned to you regarding our landfill, I submit the following:

The history of garbage in less than 10 seconds,

Humans have historically disposed of their solid waste in four ways:

1. Throw it in a pile
2. Bury it
3. Burn it
4. Throw it in the ocean

Actually 8.9 seconds.

The world continues to dispose of solid waste (household garbage) by these four methods.

There has been efforts to reduce our waste flow by recycling and reclaiming solid waste. The rate of recycling has been a function of the economy and enlightenment. Remember, recycling does not eliminate waste, it only delays its disposal.

Walmart reports that all the packaging in their stores will become waste in six months. They also state that almost everything they sell will be trash in six years. That is their business model.

When the economy is under severe stress there is an increase in recycling. During the Great Depression and World War II, recycling became a national obsession. However, there are countries and regions where recycling, reuse, and reclamation has become a function of the local culture without economic stress. Countries such as New Zealand and the countries of Scandinavia reduce consumption and reuse everything with significant success.

However, after the end of World War II there was a significant increase in the amount of trash due to the strong improvement of the world's economy. This had a dramatic impact on the four above mentioned methods of disposal. This became a serious logistics and public health problem.

The solution was to create "Sanitary Landfills." At least that's what they were originally called. The plan was to create an engineered structure that would function similar to a compost heap. The process was supposed to function as follows:

1. Find a location which had adequate vehicular access, but small voter impact.
2. Locate or create a physical subsurface barrier to ensure that no waste comes in contact with ground water.
3. Create hydraulic controls to ensure no release of leachate or toxic gasses.
4. Spread top soil between layers of waste to accelerate decomposition.
5. Finally cover the filled areas with a physical barrier to ensure storm water does not migrate into the buried waste.
6. Leave alone for approximately 25 years.
7. Come back and dig out the compost and sell commercially.
8. Start the process over.

I was present when one of the first landfills was opened to determine the quality of the compost. The landfill was located at Filberto's Sanitation on Parker Road in Chester Township, New Jersey. I was a newly elected member of the town's governing body and assigned the duty of having a local official observe the results. This landfill began receiving waste in 1948 and the test opening which I attended occurred in 1979.

Unfortunately, very little composting was realized. In fact, a front page of a New York Times with a headline reporting on the "Marshall Plan" was easily observed. Newsprint is usually one of the easiest substances to compost. The expected physical chemical reaction did not occur. It appears that the lack of oxygen within the solid waste layers was insufficient to cause adequate composting. In order to maximize the amount of trash at landfills, operators would routinely squeeze the waste with road rollers, squeezing out the needed O₂.

I became part of oversight boards both locally and regionally and was responsible for Remedial Action Master Plans from a regulatory perspective.

I have been involved in the remediation of over a dozen landfills and have been the project manager for the remediation of five landfills. These particular five landfills had a thirty-foot natural subsurface formation of a very tight clay layer. This was a very efficient way to ensure a physical barrier from the subsurface hydrology. The permeability rate of clays and other substances vary, but we must always strive to provide the best barrier so that solid waste never comes in contact with ground water.

The "composting" idea didn't work, but as long as hydraulic controls are maintained, landfills can be an efficient and safe method of disposing solid waste. However, we must ensure that no leachate or landfill gasses are allowed to move off the site from the landfill.

City of Doral

Over the years I have been asked to advise citizen groups, environmental organizations, governing bodies, government agencies, attorneys, and the media regarding the proper operation of landfills. Recently, and after many complaints of noxious odors from citizens living near the two landfills and a waste to energy plant in the area of the City of Doral, I was asked to volunteer my time and effort to accept appointment as chair of a "Task Force" to determine where the odors were coming from and any other environmental problem that might be occurring.

The empowering resolution was adopted in January 2018. We have had 11 meetings including a tour of the landfills and waste to energy facility. The geology is similar to what exists under Mt. Trashmore, limestone, one of the most naturally occurring permeable substances.

We observed no noxious odors from any of the sites. In fact, the work that we observed by the Waste Management Inc. was exceptional and state of the art. They cover up the days deposited waste with soil. They previously installed a liner at the bottom of the active fill area with five different layers of impermeable substances to ensure that none of the solid waste comes in contact with the ground water. They have a functioning leachate collection system that is discharged into the county's liquid waste facilities and a methane collection system. Very impressive.

But then....where are the odors coming from?

We asked for a presentation by the government agency that is responsible for monitoring air quality in Miami-Dade which was DERM (Division of Environmental Resources Management.) They reported that they respond to each and every complaint that is received by the city or the county. This process has been going on for years.

Unfortunately, they have not been able to determine the cause of the odors that generate the complaints. The complaints increased. Waste Management installed a large mister system pointed at the residential community where the complaints were coming from. The mister system sprays a perfumed liquid into large fans in an attempt to mitigate the noxious odors. The complaints increased.

We observed, and supported scientifically by DERM, that there wasn't any noxious odors coming from the landfill.

We inspected the older adjacent closed landfill and the waste to energy facility. No odors from there either.

No noxious odors from any of these facilities.

Where were the odors coming from?

At the meeting at the end of the tour someone asked when the multi layered liner was installed under the landfill? The answer was 1995. This is good and this system adequately protected the ground water from coming in contact with solid waste.

However, the next question was....When did the landfill start receiving waste? The answer was 1952. Therefore, all of the waste received at these landfills from 1952 to 1995 had no protective layer which would keep the garbage away from the ground water.

Remember, the area has a similar geology as the Key West landfill.

We asked for the results of subsurface water quality tests required by the State's DEP and conducted by a private firm with oversight by the County of Miami-Dade, based on standards and protocols established by the State of Florida's Department of Environmental Protection. All tests showed compliance with the state standards and protocols.

Similar to the environmental testing conducted at the Key West landfill.

How could this be?

Where were the odors coming from if the air quality and water quality passed state standards?

The air quality was easy. You could smell nothing. But move about a hundred yards off the landfill near the residential homes, and the smell was terrible.

The city submitted to us the results of a report that showed the frequency of complaints over time and we compared this data to atmospheric conditions. We found that the number of complaints increased immediately after a rain event.

Why?

We then reviewed that test data from the subsurface water quality test reports from the County's Department of Solid Waste Management and discovered that the tests did not contain data on hydrogen sulphide or other substances common to landfills that produce noxious odors.

What good are these tests if the protocol established by the state do not include the relevant substances?

Remember, 84,000 new chemical compounds have been created after the arrival of the Federal Clean Water Act. Are state testing standards keeping up with the toxic products that have been created after 1970?

Public officials can report that a landfill is in complete compliance with the state mandated protocols, but this information does not ensure that the toxic leachate is not migrating off the site of the landfill.

We also found that if there is a lateral migration toward the residential areas, the toxic substances would raise to the surface during a rain event and atomize causing the noxious odors.

Something stinks.

The City of Doral has immediately retained the services of a company that will take samples of the water, air, and soil, in

the residential areas, and if they confirm leachate migration, a health survey will be conducted to determine the health risks of the people impacted by this process.

The City of Doral has asked the Task Force to stay on after our deadline of [December 31](#), 2018 and monitor the results of these reports.

We shall see.

Mt. Trashmore,

The Key West City Manager deserves credit for achieving a certificate of compliance for the Key West Landfill by the State of Florida's Department of Environmental Protection.

Despite our landfill having no subsurface barrier at all on the bottom of the landfill, no leachate collection system, no methane collection system, no hydraulic controls, is situated next to an elementary school, a college, across the street from a senior citizen center, a hospital, next to two city facilities, and is the middle of a National Marine Sanctuary, Mt. Trashmore received a certification of compliance by the State of Florida. Our Mt. Trashmore has been receiving garbage since the early 1920s only stopping in 1992 without any environmental controls.

The submission by CH2M, our engineering company, for the certification contains all of this data. The submission was factual in that it clearly admits of tidal connection to the waste in our landfill. That is confirmed by their report that the concentration and force of the noxious gasses like methane discharges at a much greater rate when the tide is coming in proving a hydraulic connection to the ground water. They report that the worst methane releases occur from seven vent pipes and to varying degrees from the rest of the 32 vent pipes.

Methane is a serious dangerous greenhouse gas. It contains ten times the concentration as CO₂s. Therefore, just these seven 4" vents, produce the equivalent of 280 cars running and discharging CO₂s in the air 24 hours a day for many decades.

Climate Change anyone?

Samples of Hydrogen sulphide have also been collected from the discharge vents at our landfill as well as other toxic gasses. However, Methane is lighter than air and should not cause any health risks in the immediate area. Unfortunately, Hydrogen Sulphide is heavier than air and is a very dangerous toxic substance.

State standards are not site specific and do not take the neighboring uses into consideration. Our state's standards are "one size fits all" and might work in a remote area miles from a populated area such as Waste Management's facility in Okeechobee.

The CH2M report states and the State of Florida agreed that our landfill meets "minimum standards."

The members of the SB must determine if the state's "minimum" standards are adequate to protect the people who utilize the immediate area around the landfill. Especially the children of Gerald Adams School as well as the impact on the marine habitats in our near shore waters.

There will be a work shop that will focus on solid waste and landfill rules and regulations run by the State of Florida's Department of Environmental Protection [on January 9](#) in Fort Meyers. The title is "How to Ace Your Next Inspection." Someone from the City Commission should attend.

I will be available to assist the board in anyway.

Please let me know when this will be an agenda item and I will answer the question: If groundwater comes in direct contact with the garbage in the landfill, how come the water quality tests shows no leachate migrating off site into the Gulf of Mexico?

All the best.

Ed Russo