

Profile of Marin's Annual Organic Material Stream

1. Disposed directly to HWMA (aka Landfill)

"Other Organics", according to the Marin County-wide Plan Update Jan. 2007, out of the total amount of material disposed in a year equates to 46%. ("other organic" classification is for other organics except green wastes)

Household "other organic"	47,191
Business "other organic"	58,623

Total "other organic" dumped to HWMA in 2006 - 105,824 tons

2. Green Yard Organics Used as Alternative Daily Cover

According to the California Integrated Waste Management Board (CIWMB), which has the statutory responsibility to monitor recycling rates in Marin County a total of 46,675 tons of organic material collected from curbside (yard/garden) and similar organic materials directly disposed by customers at the Redwood HWMA's "green organic materials processing center" site was accounted as recycled and diverted from the waste stream.

Furthermore according to CIWMB, 100% of the "diverted organic recycled materials" ended up in the HWMA (aka landfill) being used as Alternative Daily Cover (ADC). That is ADC at the Redwood HWMA was placed directly on wastes and was used to cover up materials disposed during the day.

Total Amount Annual Organic Wastes to HWMA (Landfill) in Marin in 2006.

100% of all Organic Materials ended up in a landfill environment.

"Diverted Recycled Organic" 46,675 tons

"Other Organic" 105,824 tons

Total Annual Organic Material Stream in the Landfill = 152,499 tons

Total annual volume of materials reported disposed at Redwood "landfill" - 237,146 tons. (Marin County-wide Plan update 2007)

Note to Reader:

The term "waste" is frequently abused in modern use, waste is a verb not a noun. Also the use of the euphemism, landfill is also a misnomer, the waste disposal area is neither land nor is it fill. According to the EPA it is classified as a hazardous waste material area. (HWMA)

Introduction and Summary

The total weight of materials disposed into Marin garbage disposal environments including the organic green compost used for ADC amounts to a total of 283,821 tons. (2006)

Organic materials permanently lost and mixed-up to become contaminated toxic garbage in the disposal environment account for 54% of all materials disposed in Marin County.

It was the unanimous recommendation of the Strategic Planning Groups to establish effective programs and mechanism to recover Marin County organic material, particularly garden/yard wastes, kitchen scraps, industrial and institutional organic materials including commercially generated food wastes to maximize resource recovery of organic material to be used to enhance soil fer-

tility for valued added agricultural and home use applications. The effect of this recommendation would ban all organic materials including the use of clean organic green waste used as ADC from the garbage disposal environments.

1.0 Rationale for Recovery of Organic Nutrients

1.1 We Must Stop "Trading Soil for Oil"

Top soil is the fertile upper layer of soil without which almost nothing will grow. It is essential for life and yet it is being eroded at an alarming rate through over-use and denaturing due to the excessive use of synthetic fertilizers and toxic pesticides.

The US has lost half of its top soil since 1960, and continues losing top soil 17 times faster than nature can create it.

During the 1980's, it was estimated that the world lost 240 billion tons of topsoil in excess of new formation; that is more than half the amount found on all current US croplands combined. When we lose soil, we are losing a resource that is, for practical purposes and human time spans, essentially non-renewable.

An inch of soil takes between 200 - 1000 years to form, yet it can be swept away in a single rain storm.

"We plowed the prairie and never knew what we were doing because we did not know what we were undoing. There had been droughts before the dust bowl without resulting dust bowls; it took plowing the prairie in company with drought to really do it." Wendell Berry

1.2 Expanding Market for Compost

California was once blessed with fertile fields and an abundance of organic produce. However, growers if they are to avoid reliance on fossil fuel derived pesticides and fertilizers, need on average **5 tons of nutrient rich compost every year for every acre they crop.**

1.3 Excessive Use of Fertilizers Rob Soil of Fertility

Use of inorganic fossil fuel based pesticides and fertilizers rob the soil of its essential health. Once soil fertility is lost then agriculture becomes ever more dependent on petroleum-base products. In fact, it is estimated that about **1/2 of the fertilizer applied to US farmland is necessary just to replace nutrients that are lost with soil erosion.**

1.4 Excessive use of Fossil Fuel in Food Production

20% of America's total consumption of fossil fuels is used for the production, processing and transport of food products. On average food consumed in the Bay Area travels 1,500 miles from its point of origin to our kitchen tables.

2.0 The Case for Banning Organics from Landfill Environments

2.1 Organic material in landfill generates toxic leachate

Organic material is rich in bacteria, especially partially composted yard and kitchen wastes. When bacteria rich organic materials come in contact with solid waste material in the landfill environment, the bacteria hasten the decomposition and corrosion of all materials. The hundreds of products made with heavy metals – lead, mercury and cadmium being the three most persistent and toxic common components - are released and then begin to migrate

down into the landfill sub-surface to form a toxic mixture of highly carcinogenic liquid ooze commonly referred to as landfill leachate.

Furthermore, the placement of organic material in a landfill environment actually becomes the medium itself that carries and mixes toxic materials. If landfills are managed to minimize both organic material and intrusion of surface water into organized and compacted waste cells then leachate production is greatly minimized.

2.2 Organic Materials When Decomposing Generates Methane

The landfill environment is best described as a continuous biological reactor. Given legal requirements to apply cover (soil) to any waste materials disposed everyday, the reactor becomes anaerobic in nature. (decomposition without air). Anaerobic digestion and decomposition generates vast quantities of methane gas. Two thirds of the mass of organic materials when disposed and decomposed in the landfill's anaerobic environment are converted to a mixture of predominately methane gas, only a third of the original organic mass remains as "solid material". Methane is 23 times more lethal than carbon dioxide (CO₂) in terms of its impact on global warming and associated climate change.

It needs to be noted that recovery of organic materials for soil amendments or as compost fertilizer, the process is aerobic. Aerobic decomposition is aided by the presence of oxygen thus aerobic decomposition does not produce methane.

The inner toxic environment of the Redwood Landfill's biological reactor is considered one of Marin County's single

most significant contributors to greenhouse gas emissions.

If all organic material were to be diverted away from the landfill then GHG emissions would be greatly minimized.

2.3 Disposal of Organics to Landfill for "Energy Recovery" is Bad Science

It is estimated that less than 5 to 10% of methane off gassing at landfills that were not originally designed with state of the art lining, leachate treatment and embedded gas reticulation/ collection systems is actually collected. The thermodynamics of using landfill methane gas for direct- fire electricity generation is in its self no more that 30% efficient – efficiencies can be improved if used with a combined heat and power cycle co-generating system. However nevertheless, gas recovery at old landfills (with significant volumes of organic material historically disposed to the land) is important and should be encouraged to at least in some fashion attempt to mitigate the negative environmental effects of the methane generation.

3.0 Summary Recommendations

1. Recover organic material for economic and ecological value.

Whereas there is an urgent global, national, statewide and local need to enhance soil fertility to ensure that we are able to sustain our food growing capacity.

It is of paramount importance for Marin County to establish comprehensive consumer education programs coupled with effective

organic resource recovery collection systems to ensure that Marin's valuable nutrient-rich organic materials are processed to create value added soil amendments and or compost to be use by agriculture, institutions and homeowners.

2. Ban disposal of organic material from all landfill environments

Whereas the disposal of organic material to landfill environments results in two major avoidable environmental hazards 1) creation and migration of lechate and 2) generation of significant quantities of greenhouse gases.

It is hereby recommended that all organic material be banned from disposal to landfill environments.

3. The use of clean nutrient rich organic yard and garden materials as Alternative Daily Cover is an ecological abomination by any person's measure.

The mixing of clean fresh organic materials with toxic substance to produce chemical ooze is arguably as insane as any thing modern society does given our global crisis in soil nutrition depletion and erosion.

Technically, ADC is to be as impermeable as possible to minimize the penetration of surface water into the waste cavities so as to reduce the production of lechate and stop ground water contamination or in this case pollution of SF Bay. Green compost

is highly porous and not appropriate for ADC use.

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Marin County presently throws away enough clean organic material, losing it forever, in a toxic garbage mound, to fertilize 30,000 acres of vegetable crop land annually.