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# SLUDGE TRACKER<sup>®</sup>

A book by:

Richard C. Honour, PhD & Michelle Horkings-Brigham

The Adverse Impact of Land-Disposed Toxic Sewage  
Sludge on Human and Environmental Health

Amazon Books, *Sludge Tracker*<sup>®</sup>

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King County Sewage Sludge  
Benton County, WA

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Health / Environment / Climate / Adventure

TOXICUS AD INFINITUM

*Toxic Sewage Sludge* and other toxic wastes contaminate and pollute our living environment, inciting environmental degradation, diminished sustainability, lost biodiversity, economic hardship, adverse human health effects, and climate change, and they compromise the quality of our air, food, soil, and water. Protecting our essential resources is critical to human survival. Workable solutions exist to convert toxic wastes to renewable clean energy and beneficial byproducts—a climate crisis no longer.

SLUDGE TRACKER

## SLUDGE TRACKER

The Adverse Impact of Land-Disposed  
*Toxic Sewage Sludge*  
on Human & Environmental Health

Horus Publishing, Inc.



[www.SludgeTracker.com](http://www.SludgeTracker.com)

HORUS

Richard C. Honour, PhD  
Michelle Horkings-Brigham



SLUDGE TRACKER<sup>®</sup> is offered as an educational document to inform the public about the adverse consequences of land-disposed toxic wastes

King County Sewage Sludge  
Snoqualmie Forest



## **Contamination and Pollution = Disease**

### Sources of Land-Disposed Toxic Wastes:

- Toxic Sewage Sludges
- Wastewater Effluents
- Landfill Leachates
- Legacy Leachates
- Produced Waters
- Hazardous Wastes
- Refinery Sludges
- Septic Wastes
- CAFO Wastes
- Landfills

King County Sewage Sludge  
Snoqualmie Forest



## Land-Disposed Toxic Sewage Sludge

- Is it safe?
- What is it?
- What's in it?
- What does it do?
- Where does it go?

Answered only by  
Comprehensive  
Qualitative Chemical  
Analysis and Safety-  
Toxicology Studies of the  
revealed chemicals

- What are the Synergistic Toxicities?
- What is its fate in the environment?

King County Sewage Sludge  
Marckworth State Forest



**The Neverland of Toxic Sewage Sludge:  
What is it? What's in it? Where does it go?  
What does it do? Is it harmful?**

- The analyses never done
- The questions never asked
- The consequences never investigated
- The adverse impacts on human and environmental health never determined

King County Sludge  
Snoqualmie Forest  
King County, WA



**What are the adverse effects on:**

- Fish and Wildlife?
- Global Climate Collapse?
- Air, Food, Soil, and Water?
- Human and Environmental Health?

King County Sewage Sludge  
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## **Objective and Purpose of Land-Disposed Toxic Sewage Sludge:**

- Economic Incentives and Convenience  
(Notwithstanding the Risk, Threat and Harm to Human and Environmental Health)

King County Sludge  
Snoqualmie Forest  
King County, WA



## Classes of Biosolids (EPA, 40 CFR Rule)

**Note: There is no such thing as:**

### I. Classes of Biosolids:

a.<sup>1</sup> Class A, EQ (Exceptional Quality)

b.<sup>2</sup> Class A

c.<sup>3</sup> Class B

<sup>1</sup> Class A, EQ (Exceptional Quality): Must meet and exceed Class A pathogen reduction, plus meet requirements for metals and Vector Attraction Reduction (VAR)

<sup>2</sup> Class A: Reduce Pathogens to non-detectable levels and comply with standards for metals, odors and Vector Attraction Reduction (VAR). Can be used as fertilizer on farms and vegetable gardens, and sold as compost or fertilizer

<sup>3</sup> Class B: May contain higher levels of pathogens and may require an EPA permit

**It's all Toxic Waste**



Loop<sup>®</sup> Biosolids At Work  
Application Area Boundary



US ENVIRONMENTAL PROTECTION AGENCY  
OFFICE OF INSPECTOR GENERAL  
(Report No. 19-P-0002 November 15, 2018)

## Conclusions:

- “EPA is either not fully implementing its processes, the Clean Water Act and the Biosolids Rule, or it has control weaknesses”
- “EPA is Unable to Assess the Impact of Hundreds of Unregulated Pollutants in Land-Applied Biosolids on Human Health and the Environment”

No entre en esta área hasta:

No recoja plantas comestibles hasta:

10/2021



Para más información visite [LoopForYourSoil.com](http://LoopForYourSoil.com) o el programa de biosólidos Loop del condado de King al 206-477-5557. Puede contactar al coordinador de sept. de ecología de Washington, 3190 160th Ave SE, Bellevue, WA 98008, 425-649-7258.

King County Sewage Sludge  
Snoqualmie Forest  
King County, WA



## Definition of Biosolids (There is none)

[https://search.epa.gov/epasearch/?querytext=%28CFR%29+Part+503&areaname=&reacontacts=&areasearchurl=&typeofsearch=epa&result\\_template=#/](https://search.epa.gov/epasearch/?querytext=%28CFR%29+Part+503&areaname=&reacontacts=&areasearchurl=&typeofsearch=epa&result_template=#/)

“Biosolids is used to mean Sewage Sludge, as defined in Title 40 of the Code of Federal Regulations (CFR) Part 503, and therefore Biosolids or Sewage Sludge is the solid residue from domestic sewage, whether that domestic sewage is combined with industrial wastewater or not”

Snoqualmie River  
King County, WA



## EPA References on Land-Disposed Toxic Sewage Sludge, aka, "Biosolids"

[https://www3.epa.gov/npdes/pubs/503pe\\_2.pdf](https://www3.epa.gov/npdes/pubs/503pe_2.pdf)

<https://www.epa.gov/biosolids>

<https://www.epa.gov/sites/default/files/document/s/40CFR503-July-2001.pdf>

<https://www.epa.gov/biosolids/guide-land-apppliers-requirements-federal-standards-use-or-disposal-sewage-sludge-40-cfr>

[https://cfpub.epa.gov/si/si\\_public\\_record\\_report.cfm?Lab=CESER&dirEntryId=352653](https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=CESER&dirEntryId=352653)



## Toxic Waste is Dangerous!

The safety and quality of our air, food, soil and water are diminished by the planned and thoughtless degradation of our living environment, as encouraged and authorized by Local, County, State and Federal agencies, without regard for Human or Environmental Health

The collective Toxic Dusts from Fertilizers, Pesticides, Toxic Sewage Sludges and Hanford, impact the communities and living environments of most of Central Washington State



King County Sewage Sludge,  
Douglas County, WA



Toxic Sewage Sludge is Toxic and Hazardous Waste, not to be disposed on land or in water, especially in forests or on farms or rangelands

King County Sewage Sludge



No matter how well Toxic Sewage Sludge may be “Treated” (i.e., “Processed”) by any conventional methods, it is not Safe

**Toxic Sewage Sludge is not a Fertilizer Substitute, Soil Amendment or Compost, because it:**

- Contributes to Climate Collapse
- Disrupts soil structure and function
- Is Toxic to animals and many plants
- Inhibits functional mycorrhizal activity
- Disrupts the functional soil microbiome
- Contributes to the Toxic Soil Volatilome
- Contaminates Surface and Ground Waters
- Results in cumulative loading of toxics in soils
- Exposes wildlife and people to infectious agents



## Sewage Sludge: What's In It? - Everything!

- **Biochemicals, Chemicals, Metals, Plastics, Microorganisms, Parasites**
- “Sewage Sludge may include any and all waste materials in any form that may enter any drain that flows to any wastewater or sewer system, including all municipal wastes, industrial and manufacturing wastes, metals, chemicals, landfill leachates, pharmaceutical and personal care products, medical wastes, stormwater runoff, fertilizers, pesticides, infectious agents or biological materials, whether manmade or natural, plus new chemicals and new forms of microbes created *in situ* within the sewage conveyance system or within a Wastewater Treatment Plant (WWTP) or Publicly Owned Treatment Works (POTW), or that is a discarded waste product” (US EPA)

King County Sewage Sludge  
Benton County, WA



## MicroPlastics (50 $\mu\text{m}$ - 5 mm)

### NanoPlastics (<100 nm)

#### Sources:

- Shed from synthetic fibers
- Produced for commercial uses
- Formed in the environment as Degradation Products of MacroPlastics

Volatilization and Degradation Products incite Toxicity, including:

- Epigenetic modifications of gene expression
- Chromosomal damage, gene mutations, chronic diseases
- Enzyme Inhibition and Interference with Carbon Recycling and CO<sub>2</sub> Sequestration

## MacroPlastics (> 5 mm)

Fibers, fabrics, labels, liners, medical products, seals, wrappers, pharmaceutical & personal care products, and more.

What are the Volatilization and Degradation products? Unknown!



King County Sludge  
Snoqualmie Forest  
King County, WA



**Toxic Sewage Sludge (TSS) Contributes to Chronic Disease, Climate Collapse and Environmental Degradation**  
**Soils and Waters are our most precious resources!**

Sludged Wetlands  
Snoqualmie Forest, King County, WA



## **Core Principles and the Adverse Consequences of Land-Disposed Toxic Sewage Sludge**

- Nearly all chronic diseases are incited by the cumulative effects of long-term exposure to low levels of environmental contaminants and pollutants
- Air, Food, Soil and Water are essential resources that assure the sustainability of human and other life forms
- Our Essential Resources must be protected because they are matters of National Security

King County Sewage Sludge  
Snoqualmie Forest  
King County, WA



**Toxic Sewage Sludge is Solid Waste,  
simply renamed by altering the definitions**

Fecal Matter and other Organics are reduced by Aerobic and Anaerobic Digestion in a WWTP/POTW, leaving behind Toxic Chemicals and Solid Waste as Plastics, Glass and Metals, along with Toxic Chemicals, plus New Toxic Chemicals formed *in situ*, as well as Toxin-Tolerant and Anti-Microbial-Resistant Microbes, also formed *in situ*

King County Toxic Sewage Sludge,  
Hwy 24, Moxee, Yakima County, WA



Raw Sewage entering a  
Wastewater Treatment Plant as  
“Combined Flows” includes:

- Stormwater Runoff (Extremely Toxic)
- Municipal Waste (Incl. Medical Waste)
- Industrial Waste (Often Pretreated)
- Landfill Leachates (Highly Toxic)

King County Toxic Sewage Sludge,  
Douglas County, WA



## General Permit for Biosolids Management

Waste 2 Resources Program, Department of Ecology

Requirements for Bulk Biosolids Applied to Agricultural or Forest Land

- **10.1. Remove Manufactured Inerts:** Biosolids must meet requirements for removal of manufactured inerts (MI) in WAC 173-308-205, must contain <1% by vol recognizable MI. Screening with a max 3/8" aperture required
- **10.2. Agronomic Rate:** Biosolids must be applied at an agronomic rate in accordance with WAC 173-308-190
- **10.3. Pollutants:** Table 4 - Summary of WAC 173-308-160 Tables 1, 2, and 3
- **10.4. Pathogens:** Biosolids must meet either one of the Class A standards in WAC 173-308-170(1)-(4) or one of the Class B standards in WAC 173-308-170(5)-(7) [*Fecal coliform* or *Salmonella* spp. bacteria density]
- **10.5. Vector Attraction Reduction:** Biosolids must meet vector attraction reduction standards in WAC 173-308-180

Marckworth State Forest  
King County, WA



## 10.1. Remove Manufactured Inerts

- Biosolids must meet requirements for removal of Manufactured Inerts in WAC 173-308-205, i.e., <1% recognizable Manufactured Inerts.
- Screening with a maximum 3/8" (was 5/8") aperture is required.
- Except for Sewage Sludge approved for long-term disposal, all biosolids or Sewage Sludge must be treated by a process such as physical screening or another method to significantly remove Manufactured Inerts prior to final disposition.

**If 10.1 is met, Toxic Sewage Sludge is still Toxic Waste**

Marckworth State Forest  
King County, WA



## 10.2. Agronomic Rate

- Biosolids must be applied at an agronomic rate in accordance with WAC 173-308-190.

Biosolids Management Guidelines for Washington State  
Washington State Department of Ecology  
Publication #93-80, July 2000

Calculating Biosolids Application Rates Based on Nitrogen  
Match the plant-available N supplied by biosolids to crop N needs:

1. Collect information on site and crop, including N requirement
2. Estimate plant-available N needed from the biosolids application
3. Collect biosolids nutrient data
4. Estimate plant-available N per dry ton of biosolids
5. Calculate agronomic biosolids application rate on a dry ton basis
6. Convert the application rate to an as-is basis

**If 10.2 is met, Toxic Sewage Sludge is still Toxic Waste**



## **10.3. Pollutants**

### **WAC 173-308-160 - Biosolids Pollutant Limits**

Sets pollutant concentration limits and cumulative pollutant loading rate limits for biosolids that are applied to the land.

- (1) Table 1 - Maximum Allowable Concentration (ceiling limit) of Pollutants in biosolids applied to the land. Sewage sludge that contains a pollutant greater than the allowable ceiling limit is not biosolids, is a solid waste, and may not be applied to the land
- (2) Table 2 - Maximum Quantities of Pollutants that may be added to an area of land. The cumulative pollutant loading rates apply when the concentration of any pollutant in biosolids exceeds the allowable pollutant concentration limit in Table 3 of this section
- (3) Table 3 Lower Pollutant Concentration Threshold, when achieved, relieves the person who prepares and applies biosolids, from requirements related to recordkeeping, reporting and labeling


**If 10.3 is met, Toxic Sewage Sludge is still Toxic Waste**



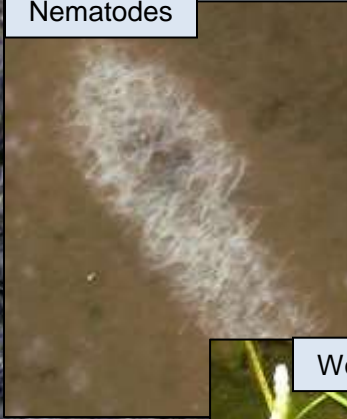
## In Situ Toxicology Field Testing on Non-Charismatic Species.

What are the consequences of Land-Disposed Toxic Sewage Sludge?  
Poor water quality; toxicity to wildlife; soil degradation; risk to public health and safety; ecosystem disruption; lost biodiversity, recreation and quality of life.


They simply dump it out there regardless of what lives or dies!




Nuttall's cottontail  
(*Sylvilagus nuttallii*)




Nematodes




Worms




Shrews & Moles




Insects



Golden-Crowned Kinglet  
(*Regulus satrapa*)



Pacific Wren  
(*Troglodytes pacificus*)



Snakes, Lizards, Newts

Snoqualmie Forest, King County  
and Snohomish County, WA



## Critical List

### Bacteria:

- *Campylobacter*
- *Salmonella*
- *Shigella*
- *Escherichia coli* (Enterohemorrhagic *E. coli* O157:H7 and O104:H4; Enterotoxigenic *E. coli*; Shiga-like toxin producing *E. coli*)
- *Klebsiella pneumonia* (VRE, CRE)
- *Acinetobacter baumannii* (CRE)
- *Clostridium difficile* (Toxin A/B)
- *Staphylococcus aureus* (MRSA)
- *Yersinia enterocolitica*
- *Vibrio cholerae*

### Viruses:

- Human Papillomavirus
- Hepatitis A, B & C
- Adenovirus 40/41
- Norovirus GI/GII
- Coronaviruses (SARS)
- Rotavirus A

### Parasites:

- *Entamoeba histolytica*
- *Cryptosporidium*
- *Giardia*

TAT ≈ 5 hours

## 10.4. Pathogens

Biosolids must meet Class A standards in WAC 173-308-170(1)-(4) or one of the Class B standards in WAC 173-308-170(5)-(7)

“Indicator Microorganisms” and “Indicator Pathogens:” **No such thing!**

“Fecal Coliform:” **Not an infectious agent!**

Six Week TAT: **Too late to take it back!**

**If 10.4 is met, Toxic Sewage Sludge is still Toxic Waste**

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## Wrong List\*

### Bacteria:

- *Escherichia coli*
- Enterobacter
- Klebsiella
- Citrobacter
- Salmonella

### Viruses:

- Poliovirus
- Coxsackie virus
- Echoviruses

### Parasites:

- Ascaris
- Hookworm
- Hymenolepis
- Taenia
- Trichuris
- Toxocara
- Helminth ova
- Giardia

TAT ≈ 6 Weeks

\* Standard used by  
WA State DOE and  
King County WTD



## The Most Dangerous Bacteria in the World (Global Perspective) WHO Priority Pathogens List

### Priority 1: CRITICAL

- *Acinetobacter baumannii*, carbapenem-resistant
- *Pseudomonas aeruginosa*, carbapenem-resistant
- Enterobacteriaceae, carbapenem-resistant, ESBL-producing

### Priority 2: HIGH

- *Enterococcus faecium*, vancomycin-resistant
- *Staphylococcus aureus*, Methicillin-Resistant (MRSA), Vancomycin-Intermediate and Vancomycin-Resistant
- *Helicobacter pylori*, clarithromycin-resistant
- *Campylobacter* spp., fluoroquinolone-resistant
- Salmonellae, fluoroquinolone-resistant
- *Neisseria gonorrhoeae*, cephalosporin-resistant, fluoroquinolone-resistant

### Priority 3: MEDIUM

- *Streptococcus pneumoniae*, penicillin-non-susceptible
- *Haemophilus influenzae*, ampicillin-resistant
- *Shigella* spp., fluoroquinolone-resistant

**Not One is Ever Tested in Toxic Sewage Sludge!**



## 10.5. Vector Attraction Reduction

(WAC 173-308-180)

- When vector attraction reduction is accomplished prior to application, the requirements in one of subsections (1) through (6) must be met
- Biosolids must meet vector attraction reduction standards in WAC 173-308-180 or be managed to reduce vector attraction in the field as described in Subsections 10.5.1 or 10.5.2:
  - ✓ 10.5.1. Injection. Biosolids must be injected so that no significant amount of the biosolids is on the surface within 1 hour after injection
  - ✓ 10.5.2. Incorporation. Biosolids must be incorporated into the soil within 6 hours after application

**If 10.5 is met, Toxic Sewage Sludge is still Toxic Waste**



Mass Extermination of Insects and other life forms attracted to Toxic Sewage Sludge



### We live in a new world of Mandated Sewage and Environmental Epidemiology

- As the Climate Changes, the Population Increases, and our air, food, soil and water resources are compromised by environmental contamination and pollution, our sewage sludges and wastewater effluents are now monitored routinely for viral, bacterial and fungal pathogens, as well as for parasites and toxic chemicals that may be the etiological agents of disease, including as epidemics or pandemics, or as introduced biowarfare agents.
- As well, there are intended or inadvertent exposures to biotoxins or to chemical immune-suppressive agents that predispose populations to infectious or other diseases that compromise human and environmental health, and national security.
- We have reached the point of No Surprises and No Compromise on matters of Public Health and National Security, and all agencies are now on notice to enhance their critical infrastructure, but have we missed the message?



# About 170,000 Tons of King County's Toxic Sewage Sludge

Stored in Benton County, WA, scheduled for disposal on Farms,  
Vineyards and Orchards in nearby Counties

## We must be Solution Providers

Thermolytic Decomposition of Toxic Sewage Sludge  
and other Wastes to Renewable Clean Energy and  
Valuable Products is an Achievable Solution



# SLUDGE TRACKER<sup>©</sup>

A book by:

Richard C. Honour, PhD & Michelle Horkings-Brigham

Consequences of Land-Disposed Toxic Sewage Sludge:

- Degradation of Air, Food, Soil and Water
- Threat to Public Health and National Security
- Accelerated GHG Emissions that assure Climate Collapse

- Toxic Sewage Sludge is Toxic and Hazardous Solid Waste
- Prevention of GHG Emissions and Climate Collapse is Essential
- Thermolytic Decomposition of Toxic Sewage Sludge is a Functional Solution
- Transformation of Toxic Wastes to Renewable Clean Energy Benefits Mankind