

SLUDGE TRACKER

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

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King County Sewage Sludge
Benton County, WA

SLUDGE TRACKER

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.

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

Horus Publishing, Inc.



www.SludgeTracker.com

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The Greatest Challenge: *Pollution¹ as Policy²*

¹ **Pollution:** The Introduction of Contaminants³
into the Natural Environment

² **Policy:** *A Principle or Action* by which a
government or its legislature is guided in the
management of public affairs or measures

³ **Contaminant:** A Polluting or Poisonous Substance

Speak Truth to Power
(Stand up for what's right)

Cow Manure plus King County Toxic
Sewage Sludge on Corn Fields
Yakima County, WA

- In Washington State there are about 192 rivers
- The number of rivers that function as Sewers for Wastewater Treatment Plants (WWTPs), Publicly Owned Treatment Works (POTWs), Stormwater Runoff, and Leachates from Landfills and Hazardous Waste Sites remains unknown
- None are excluded by Regulation, Code or Law
- It all flows to Puget Sound and/or the Pacific Ocean
- The surface and groundwaters and the wildlife therein are the victims

North Fork
Snoqualmie River
King County, WA

Contamination and Pollution = Disease

(Challenges of Failed Infrastructure and Regulation)

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

King County Sewage Sludge
Snoqualmie Forest

Land-Disposed Toxic Sewage Sludge (TSS):

- Is it safe?
- What is it?
- What's in it?
- What does it do?
- Where does it go?
- What is its fate in the environment?
- What are the adverse effects on:
 - ✓ Fish and Wildlife?
 - ✓ Air, Food, Soil & Water?
 - ✓ Global Climate Collapse?
 - ✓ Human and Environmental Health?

You have the right and
an obligation to Ask
and to Know!

***Can only be answered by Comprehensive Qualitative
Chemical Analysis, coupled with Safety-Toxicology
Studies of the revealed chemicals!***

**Never revealed - Costly & Complex
i.e., "That's the way we do things!"**

WWTP Effluents
Carnation, WA
Snoqualmie River
Chinook Bend

What is it, What's in it, Where does it go, and What does it do?

- Legacy Landfill Leachates
- Toxic Sewage Sludges
- Wastewater Effluents
- Landfill Leachates
- Produced Waters

**We don't know and neither
do they - it's unknowable!**

King County Sludge
Snoqualmie Forest
King County, WA

The Goal, Objective and Purpose of Land Disposed Toxic Sewage Sludge:

1. Economic Development
2. Lowest Cost, Most Convenient Disposal
(Notwithstanding the Costs to Human and
Environmental Health)

*The greatest trick the agencies ever
played was to convince the world
that toxic wastes are safe*

Toxic Sewage Sludge is Toxic Waste

King County Sludge
Snoqualmie Forest
King County, WA

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 EPA's 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: 8-13-20

No recoja plantas comestibles hasta: 10/2021

Para más información visite LoopForYourSoil.com o el programa de biosólidos Loop del condado de King al 206-477-5537. Puede contactar al coordinador de dept. de ecología de Washington, 3190 160th Ave SE, Bellevue, WA 98008 425-648-7258.



Toxic Waste Kills!

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

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King County Sewage Sludge,
Douglas County, WA

- King County generates about half of all Toxic Sewage Sludge in WA State
- Land-Disposal of Toxic Sewage Sludge is State Policy!



The Adverse Effects of Toxic
Sewage Sludge on Farmland Soils.

Not even a weed can be found!

King County Sewage Sludge,
Benton County, WA

We must facilitate the end of Land-Disposed Toxic Sewage Sludge (TSS), including:
Land Surface Disposal and Landfilling

There are no such things as *Class A*, *Class B* or *Exceptional Quality (EQ) Biosolids**

* Industry contrived Marketing Terms

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

Classes of Biosolids (EPA, 40 CFR Rule)

Note: Beware - There is no such thing as:

I. Classes of Biosolids:

a.¹ Class A, EQ (Exceptional Quality)

b.² Class A

c.³ Class B

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

² 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

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

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:

- ✓ 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)

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King County Sewage Sludge
Benton County, WA

MicroPlastics (50 μm - 5 mm)

NanoPlastics (<100 nm)

- Sources:
 - ✓ Produced for commercial uses
 - ✓ Shed from synthetic fibers
 - ✓ 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_2 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!

- Nearly all chronic diseases are incited by the cumulative effects of long-term exposure to low levels of environmental contaminants and pollutants, i.e., Toxic Waste
- Air, Food, Soil and Water are essential resources that assure the sustainability of human and other life forms, and must be protected - They are matters of National Security

Sludged Wetlands
Snoqualmie Forest, King County, WA
100 Meters from North Fork, Snoqualmie River

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

Definition of Biosolids (There is none)

https://search.epa.gov/epasearch/?querytext=%28CFR%29+Part+503&areaname=&areacontacts=&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

What's In It?

No one knows - Its unknowable (US EPA)

- What New Toxics are formed in it
- How does it flow in soils, wetlands, streams, rivers, Puget Sound or the Pacific Ocean
- How does it Adversely Affects forests, farms, rangelands, wildlife and Human Health
- How does it Accumulate in water, sediments and soils
- How may it be Bioassimilated and Bioaccumulated in Crops or Foods
- What may be its Fate in the Environment
- What may be the Adverse Health Effects on Humans or other life forms

Toxic Sewage Sludge-Contaminated spring waters emerging below a site of Land-Disposed Toxic Sewage Sludge, Snoqualmie Forest, King County, WA

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Sludge Ingredients:

- Oil
- Fat
- Silt
- Grit
- Hair
- Bone
- Sand
- Fungi
- Feces
- Fibers
- Plastic
- Grease
- Viruses
- Bacteria
- Parasites
- Pesticides
- Chemicals
- Plant Parts
- Metal Parts
- Biochemicals
- Heavy Metals
- Radionuclides
- Produce Stickers
- And so much more

Sewage Sludge Contains:

- Chemicals that Volatilize to generate GreenHouse Gasses
- Endocrine Disrupting Chemicals
- Organic and Inorganic Particles
- Partially Decomposed Feces
- Nanobeads or Microbeads
- Pharmaceutical Products
- Personal Care Products
- Persistent Pesticides
- Pathogenic Microbes
- Toxic Heavy Metals
- Toxic Chemicals
- Domestic Waste
- Industrial Waste
- Medical Waste
- Immunotoxins
- Microplastics
- Nanoplastics
- Carcinogens
- Neurotoxins
- Hormones
- Epitoxins



- Sewage Sludge contains all that goes down any toilet or drain, including what flows in industrial, domestic and medical wastes, stormwater runoff and landfill leachates, as combined sewer flows
- > 90,000 chemicals are approved for use in the US, with most never subjected to Safety Toxicology testing (EPA evaluates about 7 chemicals per year)
- Safety Profiles of chemicals are protected as Proprietary Technology, not disclosed

Raw Sewage entering a Wastewater Treatment Plant 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 Inch 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.

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

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

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

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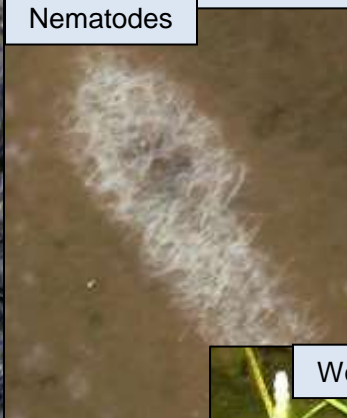
In Situ Toxicology Field Testing on Non-Charismatic Species.

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

All Images and Content are
Proprietary to Sludge Tracker

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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 of biosolids, the requirements in one of subsections (1) through (6) must be met
- The 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**



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Loop returns our excrement and toxic wastes back to us in air, food soil and water as toxic heavy metals, pharmaceutical and personal care products, endocrine disrupting chemicals, steroids, hormones, infectious agents, fertilizers, pesticides, industrial wastes, medical wastes, domestic wastes and stormwater runoff, plus the parent, congener and recombined forms of Persistent Organic Pollutants (POPs), Chemicals of Emerging Concern (CECs) and Persistent, Bioaccumulative Toxics (PBTs)



King County Sludge
Sunnyside, WA

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



King County Sewage Sludge
Benton County, WA

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Richard C. Honour, PhD & Michelle Horkings-Brigham

Consequences of Land-Disposed Toxic Sewage Sludge:

- Degraded Air, Food, Soil and Water
- Threat to Public Health and National Security
- Accelerated GHG Emissions Assure Climate Collapse

Amazon Books, **SLUDGE TRACKER**

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- Toxic Sewage Sludge is Toxic and Hazardous Solid Waste
- Prevention of GHG Emissions and Climate Collapse is Essential
- Abolition of Land-Disposed Toxic Sewage Sludge is the Singular Objective
- Thermolytic Decomposition of Toxic Sewage Sludge is a Functional Solution