

FREQUENTLY ASKED QUESTIONS (FAQ'S):

QUESTIONS, ANSWERS & FACTS ABOUT BIOSOLIDS IN NOVA SCOTIA

By NSEN Biosolids & Waste Water Caucus

- (1) **What are Biosolids?** Biosolids are organic stabilized material produced during treatment of domestic, commercial, hospital, industry, and street run-off sources of sewage and septic sludges. They include the residue removed by waste water treatment processes but do not include screenings and grit. They are removed during the preliminary treatment stages. Biosolids differ from sewage and septage sludges in that they have been treated to remove pathogens. Biosolids are used as a soil amendment or fertilizer for use on agricultural land in Nova Scotia. N-Viro Systems Canada is one of the largest generators of biosolids in the province.
- (2) **How are Biosolids made?** The treatment process includes the reduction of volatile solids by 38% or if sufficient alkaline material is added to sludge, such as cement kiln dust or fly ash, a highly alkaline material is produced. The alkaline content produces a 'corrosive' environment sufficient to reduce the numbers of microorganisms and can help decrease acidic soil conditions common in parts of the province. The alkaline mix also reduces soil availability of some metals and chemicals but has no effect on some and increases the availability of others.
- (3) **Are there different classes of Biosolids?** N-Viro produces Class A biosolids which meet a higher standard for heavy metal concentration and pathogens than Class B biosolids. Class B biosolids, generated at other facilities, are not treated or "stabilized" to the same extent as Class A biosolids and are no longer permitted for use on agricultural lands. Class B biosolids have recently been approved to be placed on public areas such as golf courses, recreational lands, land reclamation sites, trails, forests, and in commercial sod.
- (4) **What nutrients are found in Biosolids?** Biosolids are rich in nutrients such as nitrogen and phosphorous, and contain trace elements such as sulfur, magnesium, calcium, copper, and zinc. However, it is also important to note that many of the earth's major bodies of water are now developing large 'blooms' of algae overgrowth, resulting from excessive pollution of watercourses by fertilizers and human waste nutrient sources and, because they consume vast quantities of available oxygen, are responsible for killing off substantial amounts of marine life forms.
- (5) **What contaminants are found in most urban sludges?** The Environment Protection Agency has completed, in 2009, a sludge survey which determined that most urban sludges contain the following:
 - 30 metals (calcium, lead, zinc, arsenic, mercury, etc.)
 - 6 polycyclic aromatic hydrocarbons (pyrene, furanthene, etc.)
 - 6 semi-volatile organics (chloraniline, fluoride, etc.)
 - 2 inorganic anions (nitrate, nitrite)

- 6 polybrominated diphenyl ethers (flame retardants)
- 40+ Antibiotics (penicillin, cephalosporins, fluoroquinolones, etc.)
- 25 Steroids and Hormones (campesterol, estriol, desmosterol, etc.)
- 40+ Disinfectants, Antimicrobials, and Other Drugs (digoxin, codeine, soaps, perfumes, cleaners, etc.)

In addition to the above, sludges may have a potential to contain, yet not be tested for, illicit drugs, chemotherapy and radiation residues, chlorinated pesticides, and numerous bacteria, viruses, parasites, fungi, protozoa, and prions.

- (6) **How and what is N-Viro testing for in sewage sludge?** The Nova Scotia Department of Environment's guidelines recommends that testing be done for 11 heavy metals, two bacteria, dioxins, and furans on every 1,000 tonnes of treated sludge. The generators of the product are conducting their own post-treatment sampling and sending to a laboratory of their choosing. Only one sample from 10,000 tonnes of treated sludge is required to test for: industrial chemicals; flame retardants, alkylphenols, ethoxylates, pharmaceuticals, hormones and steroids, personal care products, and others. No indication is given as to what specific contaminants are being sought, or at what concentrations they will be detected, or at what levels these contaminants are to be considered 'toxic'. It is noteworthy, that most Canadian labs do not have adequate equipment that can test for pollutants properly that would give any meaningful results. Additionally, some tests, such as a highly sensitive test for flame retardants, can cost upwards of \$1,500 US each, making such testing a burden on taxpayers.
- (7) **Who is permitted to use Biosolids?** According to the guidelines, Class A biosolids may be used by a farmer on any crop or forage field. Farmers are recommended to respect separations distances, slope of land, risk of flood areas, waiting periods and having a nutrient management plan in place for the farm. Class A biosolids users need no approval from the Department of Environment. Generators of biosolids must hold an approval, however. The department's Approval # 2005-0455546-A02 states that, "The Approval Holder shall communicate to the general public the use of Exceptional Quality/Class A biosolids generated at the Facility. The communication plan shall include, but not be limited to, local and, provincial media, contact with municipalities where product will be utilized, and a contact phone number where enquiries may be directed." This is not being done in communities receiving N-Viro or any other Class A biosolids.
- (8) **When did the practice of using treated sewage sludge as a soil amendment start in Nova Scotia?** Although some municipalities allow sewage sludge to be put on farmland over past years, many others do not. N-Viro began processing biosolids in 2008, and immediately began land applying it once the Department of the Environment granted its Approval.
- (9) **Did the Province first consult with farming communities and engage in discussions with rural residents before approving the use of Biosolids on their agricultural land and in and around their communities?** No. If asked, farming communities would have questioned the merit of

having urban waste products being transferred from HRM to rural landscapes. Broad public opinion considers food “tainted” if grown or raised using biosolids. The farming community would, undoubtedly, have expressed concerns that the use of biosolids by some farmers could negatively impact the buy local initiatives fostered by the Department of Agriculture.

- (10) **Is there problem with foul odors or particulate matter entering the air from land spreading of Biosolids?** Yes. Cement kiln dust is very particulate and irritating to airways because of its caustic properties. Cement kiln dust may also contain numerous heavy metals such as the carcinogen, thallium. Dust particles may contain dead pathogens and fungi and can cause allergic alveolitis. Heavy metals such as beryllium are damaging to the lung tissue when inhaled. Problems with foul odors are a problem with neighbors and, although temporary, can negatively impact property values and the quality of living in rural communities.
- (11) **Is land application of bio-solids safe?** No. The following adverse effects have been noted on lands following treated biosolids application:
- Loss of soil fertility (excessive loading of soils with heavy metals - copper, zinc, molybdenum - destroy good soil microorganisms)
 - Contamination of ground water sources with pollutants (copper, lead, zinc, and pesticides via facilitated transport onto organic molecules)
 - Regrowth of pathogens in biosolids after mixing with soil (potential for food-borne illnesses – salmonella, coliform bacteria, viruses, prions)
 - Contamination of soils with persistent and bio-accumulative toxins, such as heavy metals (lead, cadmium - breast cancer), persistent and volatile organic pollutants (such as flame retardants - carcinogenic), hormones/steroids (affect human and wildlife reproductive function), any thousands of other chemicals
 - Uptake and storage of contaminants by some plants/forages
 - Livestock illness and death (nutrient imbalances, direct ingestion of biosolid contaminants/pathogens in forages)
 - Risk of liability to end users (farmers) regarding complaints of human or animal illness, environmental contamination , and potential loss of property value.
- (12) **Is it safe to eat foods grown or raised on soils where Biosolids are used?** No. It has been well documented that livestock ingesting biosolid treated fields can store contaminants in body fat and milk glands (thallium and flame retardants are both lipophilic (fat loving) and carcinogenic. Some plants, such as green leafy vegetables take up and store heavy metals (lead, molybdenum, etc). Incidences of cancer, respiratory diseases and food –borne illnesses are on the rise and we must consider that land application of toxic sludge could be a major contributor.
- (13) **How will I know if Biosolids are being used in my community?** Unfortunately, you won't know. Regulations as set out in the Approval process and recommendations put forth in the provincial guidelines are already being ignored (see question 7). Asking whether a particular farmer is using the product will most likely result in denial. Asking the generator of biosolids to disclose

who is using their product and where it is being used will not be answered either. Trucking companies hauling the product to agricultural destinations are not permitted to disclose who the end users are. The Department of Environment has facilitated and promoted the biosolids industry to be non-transparent and non-labile for negative impacts. Citizens remain uninformed and unengaged.

- (14) Can Nova Scotians expect to see products resulting from Biosolids use be labeled as a means to promote informed consent on consumer goods? **Not likely.** There are no plans to label foods grown using treated sewage sludge as fertilizer. The reason may be simple if you consider that, by adopting the practice of non-labeling, any complaints of ill health or environmental contamination resulting from product use would be virtually untraceable back to the users or generators of the product. The Organic Council of Nova Scotia prohibits the use of any form of human waste/sewage products to be used in growing/raising of food stuffs. Organic farmers consider biosolids being used as fertilizer as an unethical and unsustainable land stewardship practice and warn that users of biosolids may not be allowed to convert to organic status in the future.
- (15) Who is bearing the burden of costs of process and to transport this product to rural agricultural districts? Taxpayers paid for N-Viro's \$12.5 million plant and the facility claims that it costs \$175.00 to process one tonne of biosolids. No mention is made whether this cost includes transportation from the waste water plant to the facility or if taxpayers are subsidizing the transportation from the facility to rural communities. Selling price to farmers is \$19.00 per tonne.
- (16) Are farmers being advised of the potential risks of contamination to soil and/or groundwater sources? Of the potential for reduced fertility of soils? Of the potential for human and/or livestock illness? Of the potential to be legally bound to foreclose whether or not they have used bio-solids on their crop or forage fields at the time of sale or transfer of property? Farmers may not be fully aware of the potential risks associated with using biosolids in the context described above. Some farmers may not be overly concerned about risks because chemical fertilizer costs are soaring. Even though many farmers have nutrient management plans or land application plans for fertilizer use and would receive instruction about how much needs to be applied at any given location for maximum benefits, some may not be aware that nutrient management planners may also pose as consultants or promoters for the biosolids industry.
- (17) Who will be liable if agricultural soils and/or groundwater sources are contaminated, if soil fertility is lost, or property salability decreases as a result of bio-solids being used? The Department of Environment stated that it will be the end user who will be responsible. Without labeling or public knowledge about where product was used and by whom, perhaps no one will be ultimately liable for any resultant negative impacts.

- (18) What are the risks to our agricultural industry if public perception about food safety of locally-produced goods is questioned? It is believed that the ramifications to the buy local initiative will be hugely negative as the practice of using a potentially toxic fertilizer on food crops or forage crops will undermine consumer confidence and eliminate any local advantage in selling local foods. This, in turn, will favor commercial enterprises which import from low wage labor communities and where their farming practices are unknown as concerning food safety and environmental issues.
- (19) Are there other disposal alternatives for Biosolids? Yes. Landfilling is no longer an option in Nova Scotia for wastes considered “organic”. Lagooning, wetlanding, and compost toilets are all natural options whereby a variety of organisms degrade human waste rendering clean water. Another alternative is fluid bed incineration where the sludge is reduced to a negligible mass and pollutants are destroyed without entering the atmosphere by high heat application. Plasma assisted oxidation of sludge (PASO) is a newer technology which creates energy from the UV irradiation of sludge which destroys contaminants and reduces the mass of sludge substantially. BioGas generation is another option whereby methane gas is produced by anaerobic digestion of waste material.

REFERENCES & WEB SITES:

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Report – Targeted National Sludge Survey:
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