APPENDIX I

SOLID WASTE ISSUES

Regulating Agricultural Utilization of Solid Wastes in Maine

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Introduction: For decades, Maine industries have recycled organic solid wastes into fertilizers and soil amendments. Today, Maine is seen as a leader in this field (Goldstein, 2000). The Maine Department of Environmental Protection (the DEP) allows these solid wastes to be recycled, if the DEP determines that the use will not pollute any water of the State, contaminate ambient air, constitute a hazard to health or welfare, or create a nuisance (38 MRSA 1310-N). "Agronomic utilization" or "utilization" means the land application of residuals in a controlled manner in order to supply crop nutrients, improve soil conditions, or provide some other horticultural benefit. "Residuals" are solid wastes generated from municipal, commercial or industrial facilities that have undergone scrutiny by the DEP to make sure they are suitable for agronomic utilization. Residuals that have been approved for use include food, fiber, vegetable and fish processing wastes; dredge materials; biosolids; sewage sludge; short paper fiber; dewatered septage; and ash from wood, sludge or other fuels.

State Regulations: The Department has been overseeing utilization activities since the late 1970s. The DEP currently licenses agronomic utilization activities under Chapter 419, "Agronomic Utilization of Residuals" (effective December 19, 1999). Under this Chapter, a residual generator must first demonstrate to the DEP that land application of their residual would benefit crops or soil. Then, based on the contaminant concentrations in the residual and proposed uses, the DEP assesses the risk to public health and the environment. Finally, the DEP determines how the residual must be handled at the utilization site to prevent adverse impacts. These decisions are made through a licensing process, in which the generator of the residual notifies the public and then submits a proposal. The DEP reviews the information and all the comments submitted on the application and then issues a written license that either approves or denies the proposed project. Any license issued by the Department specifies the circumstances under which the residual may be used. The degree to which a residual is regulated varies with the potential human or environmental threat posed by the material. Generators must obtain site specific licenses from the DEP to utilize residuals that require special handling or when protection of public health and the environment depends on specific site characteristics, such as depth to bedrock, depth to water table, slope, and soil type. Utilization of benign residuals, such as clean woodash, is afforded through a blanket approval process.

Benefits: The potential benefits of a given solid waste will vary. Residuals such as sewage sludge and fish by-products are rich in nutrients, and are ideal replacements for mineral fertilizers. Farmers can substitute other residuals for agricultural lime, such as wood ash and lime-mud, to adjust soil pH for optimal plant growth. Other residuals, such as primary paper mill sludge or wood wastes, can enhance a soil's moisture holding capacity and structure. By using these products, farmers and foresters can increase the health of their crops (e.g. Clapp, 1993), which may in turn reduce the need to apply pesticides or herbicides.

Pathogens: Sewage sludge, dewatered septage, and similar residuals contain pathogens. Pathogens are microorganisms that can cause disease in humans, including bacteria, viruses, protozoa and helminth ova. The DEP has not established risk based standards for pathogens due to their high variety in sewage sludge, the cost and uncertainty of identifying and quantifying viable pathogens, and the lack of risk assessment protocols for these organisms (Farrell 1992; EPA, 1999). Rather, the DEP uses technology-based standards for treatment of pathogens; before being used, these residuals must be treated in a certain way to kill pathogens.

At a minimum, the DEP requires that residuals containing pathogens be treated by one of six processes which will reduce pathogen concentrations by at least 90%. Most Maine treatment plants achieve this so-called "Class B Pathogen Reduction Standard" through lime stabilization, in which enough lime is mixed with the sludge to raise the pH to 12 after two hours of contact with the lime. Once a residual has undergone a Class B process, it may be land applied at a licensed site. After being land applied, pathogenic organism are reduced to background concentrations by environmental factors such as ultraviolet radiation from the sun, competing soil microorganisms, drying out, temperature changes, soil pH, and organic matter (Farrell, 1992). In order to protect public health while this environmental destruction of pathogens takes place, Chapter 419 mandates waiting periods before a farmer can harvest crops or graze livestock on the land where Class B-treated residuals are utilized. The DEP requires that a generator obtain a utilization permit prior to land application of a residual that is treated to a Class B standard, to ensure that the sites are appropriately managed.

Table 1: Waiting Periods After Using Pathogen-Containing Residuals that are treated to a Class B Pathogen Reduction Standard

Waiting period (in months)	How the Residual is Land Applied	Type of crop	Location of harvested parts
14	top-dressing to land surface	food	above soil
20	incorporated after residual is on the land surface for 4 months or more	food	in soil
38	incorporated within 4 months of application	food	in soil
1	surface or incorporated	feed/fiber	n/a
1	surface or incorporated	grazing	n/a
12	surface or incorporated	Turf	n/a
38	surface or incorporated	topsoil	n/a

Residuals containing pathogens, such as sewage sludge, can also be treated more fully, to a so-called "Class A Pathogen Reduction Standard", using one of ten different processes. In a Class A process, pathogen concentration are reduced to natural background soil concentrations (Rubin, 1994). In the State of Maine, this is usually done through composting the residual. Heat drying is another common Class A process that generators in other states use to treat sewage sludge before it is marketed in Maine. The DEP generally licenses compost use under a blanket "Program" license, rather than requiring site-specific permits. This is because harvesting restrictions are not required for compost products as they are for Class B residuals, composting reduces odorous emissions, and nutrients are generally less available in composted materials as compared to unprocessed materials. The DEP requires compost facilities to monitor and report compost quality and the volume of compost sold in the State. The facility operators must also record to whom they sell the compost, and its intended use. DEP inspections ensure that the information is accurate.

Nutrient Imbalances: Groundwater contamination is a potential problem at utilization sites if nitrogenous residuals are mishandled. Nitrogen contamination in groundwater, reduced to nitrite by bacteria and ingested by humans, interferes with the blood's ability to transport oxygen to cells, particularly in infants (Hicks, 1993). DEP regulations protect groundwater by requiring that nitrogenous residuals be applied at an agronomic rate. An agronomic rate is the amount of residual necessary to supply the nitrogen needs of the crop for optimal growth, without oversupplying nutrients. If excess nitrogen is supplied, it will dissolve in rainwater and leach into groundwater. DEP also requires that the residual be applied during the growing season. In this way, the crop takes up the nitrogen before it passes through the root zone to groundwater. Further, the DEP prohibits utilization of nitrogenous residuals on excessively drained soil or on shallow soil. Finally, as an added layer of protection, nitrogenous residuals can not be applied within 300 feet of a water supply well.

When utilizing phosphorus-containing residuals, the DEP is concerned with potential degradation of surface water quality. Phosphorus from the residual tends to bind with soil particles on the site. However, if soils erode from the site into nearby surface waters, water quality can be adversely impacted (MEDEP, 1992). Phosphorus is the limiting nutrient in most surface waters (Krebs, 1978). When soil washes into a surface water body, the phosphorus acts as a fertilizer and greatly increases algae plant growth in the waterbody, giving the waterbody an unsightly green tinge. This cuts down on the sunlight that reaches the bottom, and the plants die and sink. The decaying process uses up the oxygen at the bottom of the lake, so that there is not enough oxygen for cold-water fish populations. To prevent this eutrophication process, in sensitive watersheds the DEP requires that no more phosphorus be added to a utilization site than will be removed when the crop is harvested. In this way, phosphorus concentrations in soil cannot increase above background concentrations. In less sensitive watersheds, DEP requires that buffers between the utilization area and drainage features be established and maintained. While soil phosphorus concentrations may increase in these areas, the buffers filter out soil and phosphorus to help protect surface waters. Additionally, the DEP prohibits utilization of high phosphorus residuals on poorly drained soils and on steeply sloped land, again to help prevent soil with high phosphorus concentrations from running into a waterbody. Finally, the DEP requires that landappliers monitor soil phosphorus content, and cease use of an area if the phosphorus concentration exceeds reasonable levels.

The DEP is also concerned that repeat utilization at sites will ultimately damage soil health, and thus crop productivity. Therefore, the DEP requires annual soil tests at licensed utilization sites to monitor the balance of essential minerals, such as potassium, magnesium, calcium and phosphorus. These tests also ensure that the soil is optimally balanced for soil pH, organic matter content, and has the optimal ability to retain essential nutrients, as measured by the soil's Cation Exchange Capacity (CEC). The optimal target levels in soil for these parameters will vary depending on the crops being grown (Hoskins, undated). Residual utilization increases the optimal levels of one or more of these parameters in soil, and thus increases crop growth. However, residuals may over-saturate the CEC with a given cation, thus displacing other essential cations that leach from the system. When cation imbalances are detected, the DEP requires the generator to restore the nutrient balance through the addition of other nutrients. Generators of residuals are beginning to blend residuals to provide nutrients balanced to the crop's need. In this way, residual generators leave the soil at utilization sites healthier than it was when they began to use the site.

Heavy Metals: Some residuals, such as woodash or sewage sludge, may contain heavy metals which, in excessive amounts, could be detrimental to human health, crop productivity, or wildlife. The DEP requires that generators monitor metal levels in residuals and prohibits land application of residuals that exceed State standards. Historically, some residuals, such as sewage sludge from industrial areas, had extremely high heavy metal concentrations. However, in 1982, the Clean Water Act mandated that industrial dischargers pre-treat their effluent to remove contaminants that accumulate in a treatment plant's sludge, so that today most sewage sludge has metal levels that are well within acceptable limits. Woodash generators can change the fuel mix to meet DEP standards. Other residual generators can manipulate process controls or change chemical inputs in order to meet residual concentration standards.

In addition to residual concentration standards, the DEP has established limits on the amount of heavy metals that can be put on a site in any year, and over the lifetime of site use. When the level of metals in a residual exceeds conservative (low) screening standards, the generator of the material is required to calculate how much metal will be loaded onto the site, and confirm the calculations with actual soil tests. The rules establish maximum lifetime loading rates in order to make sure that the site remains suitable for any future use, and does not adversely impact abutting properties. In the past 30 years of utilization in Maine,Cation saturation of the CEC or nutrient buildup in soil has curtailed utilization activities long before the site reaches soil metal limits: utilization of residuals has never been suspended due to high metal loading. In fact, soil data from the most heavily utilized sites in Maine (Houtman, 1995) shows that soil and plant metal concentrations are still within typical agricultural soil (Pollock, 1997; Shacklette, 1984) and plant (ERG, 1992) background concentrations, and do not even approach risk based standards (ERG, 1992). In addition to residual quality standards, residuals with high metal concentrations can only be used on sites where soil types, buffers, and low slope will protect surface and ground water from heavy metal impacts.

The DEP established metal standards based upon a critical review of a 1992 risk assessment conducted for EPA as they developed Federal sewage sludge regulations. EPA evaluated fourteen (14) pathways of exposure including direct ingestion of sewage sludge by children, drinking water impacts, contamination by airborne dust, ingestion of plants or animals from sludge amendment sites, phytotoxic effects and impacts to animals (ERG, 1992). The EPA risk assessment is specific to the sewage sludge matrix. Therefore, the results of the

EPA risk assessment on sewage sludge can not be directly applied to other media, such as woodash. DEP also assessed new toxicological information from hazardous waste site clean-ups. The DEP developed risk-based standards designed to protect human health and wildlife from adverse impacts while the site was being utilized, and after utilization was concluded. Then, the standards were further reduced when existing technologies made lower metals concentrations feasible in the residual. Appendix A contains heavy metal standards for sewage sludge & other residuals.

Dioxin: Dioxin and furans are a class of 205 halogenated aromatic hydrocarbons, which can have detrimental impacts on human health at very low concentrations (EPA, 1994). Several congeners of dioxin and furans have been detected in sludge from sewage treatment plants, and in some residuals from tanneries, textile mills, and paper mills (Mower, 2000). Dioxin forms when organic substances are heated in the presence of chlorine. Sources of environmental dioxin are from the use of herbicides containing 2,4,5-T; wood preservatives; incineration of bio-medical, hazardous and solid wastes; wood combustion in the presence of chlorine; transformer fires; and leaded gasoline use (ASTDR, 1989). Dioxin in sewage sludge may come from industrial dischargers to the system, or from airborne dioxin settling onto land areas, and then being washed into storm sewers, and then into the treatment plant. The dioxin is not formed in the sewage treatment process.

The DEP requires that, prior to utilization, generators test sludge and residuals with the potential for containing dioxin. Dioxin and furan concentrations are expressed in dioxin equivalents, which is the summation of the dioxins' proportional toxicity to the most potent dioxin congener, 2,3,7,8 tetrachlorodibenzo-*p*-dioxin (2378 TCDD). The DEP prohibits the use of residuals that contain greater than 250 ppt dioxin equivalents. The DEP requires that generators that spread residuals containing greater than 27 ppt dioxin equivalents measure the resultant concentration in soil. If soil concentrations exceed 27 ppt dioxin equivalents, the generator is required to put a restriction in the property deed that prohibits growing crops or raising animals for human consumption at the site. Additionally, generators must locate and manage sites to minimize erosion of soil into waterways when utilizing residuals with greater than 27 ppt dioxin equivalents. There are no additional restrictions for utilization of residuals containing 27 ppt dioxin equivalents or less.

Currently all Maine sewage treatment plants landfill sludge that routinely has concentrations above 27 ppt 2378 TCDD equivalents. Paper mills historically had sludges that exceeded these standards. However, with the phasing out of chlorine use in the papermaking process, the concentration of dioxin has dropped below 27 ppt.

Other Hazardous Substances: Other organic hazardous substances have been detected from time to time in residuals generated in Maine. These hazardous substances are often divided into general categories based on the methods used to analyze for them, such as volatile compounds and acid/base-neutral compounds, or by specific chemical classes such as poly-chlorinated biphenyls (PCBs) or dioxins. Sludge or residuals generated in industrial settings have the potential to contain these hazardous substances. Therefore, the DEP requires that generators test for these compounds before utilization. Examples of residuals found to contain these substances are sewage sludge with industrial inputs, paper mill sludge, and textile sludge.

When hazardous substances are detected in a residual, the DEP screens the concentrations of contaminants against risk-based standards in the solid waste rules. These standards were developed based on soil clean-up guidelines (e.g. EPA, 1994b; Smith, 1995). These guidelines are designed to protect a highly exposed individual ingesting either soil or groundwater contaminated by soil. The approach of screening residual concentrations against guidelines developed for soil errs on the side of protecting human health since the approach does not take into account the dilution, volatilization and degradation that will reduce contaminant concentrations at the utilization site (Overcash, 1981, Howard, 1991). However, in the majority of instances, the contaminant concentrations found in residuals are less than these conservative screening guidelines. In situations where residuals exceed these screening guidelines, site- specific research into degradation processes or more sophisticated risk assessments are conducted to determine if the residual can be safely utilized, or if it must be landfilled.

Odors: Nitrogenous solid wastes can generate offensive odors at utilization sites. These odors can be strong for several days and may last two weeks, depending on the residual being utilized and weather conditions. Mixing of odorous materials with other residuals, such as woodash, can alleviate odors. Site management practices, such as incorporation of the residual into the soil, setbacks to residences, or waiting for favorable weather conditions can also mitigate odor impacts. Under Chapter 419, the DEP requires that land appliers develop and implement a site-specific odor control plan to alleviate odorous emissions from utilization activities.

Groundwater monitoring: Scientists have done extensive research into the impacts on groundwater from the use of manure, sewage sludge and other residuals (e.g. Doak et.al, 1995; Dowdy et. al. 1993). Based on this research, the DEP was able to establish the residual standards and siting requirements described above to protect groundwater from adverse impacts. Therefore, the DEP does not require routine groundwater monitoring at utilization sites. The DEP does require that the generator monitor groundwater at utilization sites when the residual will be used in an innovative way and sufficient research has not been done on groundwater impacts. For instance, short-paper-fiber from paper recycling operations has been blended with mineral fertilizers or sewage sludge to make artificial topsoils. These topsoils have been used as the medium in which to grow the vegetative layer on dozens of landfills that have been closed in Maine. The topsoil demonstrates a superior resistance to erosion, and supports a healthier cover crop than natural topsoils. As use of this artificial topsoil expands into gravel pit closures, the DEP is requiring that users monitor groundwater at reclamation sites to ensure that groundwater is not adversely impacted. The DEP has also entered into a cooperative agreement with the University of Maine to assess whether field storage of sewage sludge poses a contamination risk to groundwater through nitrate leaching. Nitrogen is generally the parameter of concern monitored at a utilization site since it has a higher mobility in the environment than pathogens, metals, or other organic pollutants (Dowdy, 1993; Larson, 1993; ERG, 1992; NWWA, 1989).

Economics: While solid waste by-products from industries may provide an agronomic benefit to farmers or foresters, improper utilization of these residuals can have deleterious effects on the environment as described above. Generators must remove residuals from treatment plants or factories on a regular basis or they interfere with the primary function of the facility, yet the residuals are only needed at the farm during limited windows of time dictated by crop production. Putrescible residuals may need to be composted or otherwise stabilized to allow for storage. Proper utilization requires that residuals be stored, transported and appropriately managed at the site of utilization, costing in the neighborhood of $20 to $45 a ton to land apply, and $30 to $60 a ton to compost. The marginal cost of landfilling ranges roughly from $5 per ton for a company to dispose of waste at its private landfill, to over $80 a ton at a commercial landfill. However, landfilling costs are significantly higher if the full cost of developing, operating, and closing new landfill space is factored in. Therefore, it would appear that direct agricultural utilization and composting prior to utilization would realize significant savings over landfilling, so materials will be recycled rather than landfilled. However, transportation costs are often the most significant factor precluding utilization. For instance, Great Northern Paper demonstrated that land application of their papermill sludge had a significant benefit of increasing crucial organic matter on potato land. However, the transportation costs to agricultural areas, as compared to transportation to the facility's adjacent landfill, precludes utilization of this resource. The dryness of a residual is also an important economic factor in determining the feasibility of utilizing a residual, since moisture content bears directly on the weight of the residual and influences how easily the residual can handled.

Some people advocate the deregulation of residual utilization, and allowing the free market to dictate use. The problem with this is that there are external costs that are not included in by-product handling that must be internalized. Simply stacking residuals outside the generator's gate has significantly lower short-term costs than proper utilization or disposal. However, external costs of groundwater contamination, public health impacts, or the generation of nuisances for abutters are not accounted for in this scenario. While the long-term costs of remediating environmental damage from improper disposal will be much greater than landfilling costs, this is not factored into the short-term cost equation. Therefore, DEP's regulation of residual utilization is needed to compensate for the short-term free market incentives to improperly handle these residuals. The regulations also serve to decrease a generator's long-term cost that would otherwise stem from remediating contaminated sites.

Conclusion: Utilization is the land application of solid waste residuals to derive an agronomic benefit. Since 1978, DEP regulations have effectively protected human health and the environment from the risks posed by utilization, while allowing the recycling of valuable resources back to the land, and providing cost-effective disposal options for generators. Specifically, the regulations require generators to meet residual quality standards, apply at agronomic rates, and adhere to siting standards. The regulations were revised in late 1999 to incorporate experience gained from implementing the rule during the previous two decades, the latest scientific research, and legislative changes. Continued regulation of utilization is necessary to maintain protection of human health and the environment, compensate for short-term free market incentives to improperly handle residuals, and to avoid increased long-term costs to generators from remediating contaminated sites.

References Cited:

ASTDR, June 1989, Toxicological Profiles for 2,3,7,8, Tetrachlorodibenzo-*p*-dioxin, ASTDR/TP-88/23.

Chapter 567, 06-096 Code of Maine Regulations, Rules for Land Application of Sludge and Residuals, last amended January 4, 1994).

Clapp, C.E., et. al., 1993, "Crop Yields, Nutrient Uptake, Soil and Water Quality During 20 Years on the Rosemont, Mn Sewage Sludge Watershed", in Sewage Sludge, Land Utilization and the Environment (Conference Proceedings, Soil Science DEP and USDA-ARS, Univ. of Min., St. Paul, MN 55108) August 11-13.

Doak, R., R. Kirschbergen and J. Jemison, 1995, Groundwater Protection Pilot Project (Nitrates and Agrichemicals), (Prepared for the MDEP, 17 SHS, Augusta, ME 04333) 17 p.

Dowdy, R.H., C.E Clapp, D.R. Linden, W.E. Larson, T.R. Halbach, and R. C. Polta, 1993, "Twenty Years of Trace Metal Partitioning in the Rosemount, MN Watershed", in Sewage Sludge, Land Utilization and the Environment (Conference Proceedings, Soil Science DEP and USDA-ARS, Univ. of Min., St. Paul, MN 55108) August 11-13.

ERG, Eastern Research Group, 1992, Technical Support Document for Land Application of Sewage Sludge, Vol I & II (Prepared for USEPA, 401 M Street S.W., Washington D.C., document number PB93-1105757).

EPA, 1999, Control of Pathogens and Vector Attraction in Sewage Sludge, (EPA/625/R-92/013), October

EPA, 1994, Estimating Exposure to Dioxin-Like Compounds, Volume II: Properties, Sources, Occurrence and Background Exposures (External review draft, EPA/600/6-8/005Cb) June.

EPA, 1994b, Soil Screening Guidance, (External review draft, EPA/540/R-94/101, PB95-963529) Dec.

Farrell, Joseph B., 1992, Technical support Document for Reduction of Pathogens and Vector Attraction in Sewage Sludge (Edited by Jan Connery of Eastern Research Group, for USEPA, 401 M Street S.W., Washington D.C., document number PB93-110609)

40 CFR Part 503, Standards for the Use and Disposal of Sewage Sludge, last revised October 25, 1995.

Goldstein, Nora, 2000, "The State of Biosolids in America", BioCycle Journal of Composting & Organic Recycling (JG Press, Inc., Emaus PA) Vol. 41, No. 12, December 2000

Hamparian, Vincent V., et. al., 1985, "Sludge Disposal on Farm Land: An Epidemiologic Evaluation of the Risk of Infection" in Demonstration of Acceptable Systems for Land Disposal of Sewage Sludge, by Robert E. Brown, Ohio Farm Bureau and USEPA (USEPA Document No. EPA/600/2-85/06) August.

Hicks, LaBelle, 1993, Maine Dept. of Agriculture, "Human Health Effects of Nitrogen in the Environment" in conference proceedings for Nitrogen in the Environment (University of Maine, Water Resources Program, 5715 Coburn Hall, Orono, Maine 04469-5715), Oct. 10

Hoskins, Bruce, (undated), "Interpreting Soil Test Results for Commercial Crops" (Maine Soil Testing Service, 25 Deering Hall, University of Maine, Orono, Maine 04469)

Houtman, Nicolas R., Larry M. Zibilske, David Power, (1995), Survey of Soil Chemistry Data at Sludge Application Sites in Maine, (Maine Sludge and Residuals Utilization Research Foundation, Research Report No. 4, University of Maine at Orono, ME)

Howard, Philip H., et. al., 1991, Handbook of Environmental Degradation Rates, (Lewis Publishers, Chelsea, Michigan).

Krebs, Charles J., 1978, Ecology: The Experimental Analysis of Distribution and Abundance, (Second Edition, Harper & Row Pub., New York, NY)

Larson, W.E. August 11, 1993, "Case Study - Rosemont, Minnesota Watershed" in Conference Proceedings from Sewage Sludge: Land Utilization and the Environment (Soil Science DEP and USDA-ARS, University of Minnesota, St. Paul, MN 55108).

MEDEP and MEDHS, 1994, Guidance Manual for Human Health Risk Assessments at Hazardous Substance Sites, (BRWM, MEDEP, 17 Station, Augusta, ME), June

MEDEP, April, 1992, "Best Management Practices to Control Nonpoint Source Pollution, a Guide for Town Officials" (BL&WQC, MEDEP, Station 17, Augusta ME, 04333-0017).

Mower, Barry, March 2000, 2000 State of Maine Dioxin Monitoring Program, (BL&WQC, Maine MEDEP, 17 Station, Augusta, ME).

MWCA, Maine Waste Water Control Association, March 19, 1986, "Potential Health Effects from Dioxin Containing Sludge", (BRWM, MEDEP, 17 Station, Augusta, ME).

Nault, Gary, August 22, 1984, memo to Board of Environmental Protection, "Written Statement Explaining How DEP Handled Comments Concerning Rule 567, Rules for Land Application of Sludge and Residuals" (BRWM, MEDEP, 17 Station, Augusta, ME).

NWWA, 1989, Introduction to Ground Water Geochemistry (Course proceedings: National Water well Association, Dublin, OH) Oct.

Overcash, Michael R. (Ed.), 1981, Decomposition of toxic and Nontoxic Organic Compounds in Soils, (Ann Arbor Science Publishers, Inc., Ann Arbor, MI).

Pollock, James (1997), Background Metal Concentration on Agricultural Soils in Maine, prior to residual utilization (BRWM, MEDEP, 17 Station, Augusta, ME)

Rubin. Alan B., Water Environment Federation, Memo to Interested Parties, RE: Pathogens in Sewage Sludge, October 13, 1994.

Shacklette, Hansford T. and Josephine G. Boerngen (1984), Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States (USGS Professional Paper 1270, US government printing office, Washington, D.C.)

Smith, Roy, 1995, EPA Region III Risk Based Concentration Table, (USEPA Region III, Philadelphia, PA).

Sproul, Bryce, Sept. 17, 1986, Memo to Board of Environmental Protection "Written Statement explaining the factual and policy basis for the amendment to Chapter 567, Part D", (BRWM, Maine MEDEP, 17 Station, Augusta, ME)

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
NON-HAZARDOUS WASTE TRANSPORTER PROGRAM

HISTORY: Regulations were adopted in 1991 pertaining to the transportation of non-hazardous waste within the State of Maine. Unless exempt, all vehicles and/or containers transporting non-hazardous waste within the state must have a license. The transportation of certain wastes (category A & C) require manifesting. Copies of the manifests are submitted to the Department on a quarterly basis.

1. What is a non-hazardous waste?

Non-hazardous waste is any solid waste, special waste, or septage that is not otherwise classified as a hazardous waste, biomedical waste, or low level radioactive waste.

Solid waste will include garbage, rubbish, refuse, construction and demolition debris, and tires.

Special waste means in general terms solid waste generated from industrial sources which has been identified by the legislature and the Board of Environmental Protection in statute and regulation and requires special handling, transportation, and disposal procedures. By example, special wastes may include boiler and incinerator ash, paper mill sludge, medical waste, petroleum contaminated soils, and sandblast grit.

Septage includes waste, refuse, effluent, sludge, and any other materials from septic tanks, cesspools, or other similar facilities.

2. What is a non-hazardous waste transporter?

Anyone transporting septage or special waste or solid waste within the State of Maine is a non-hazardous waste transporter unless:

> *the transportation of municipal solid waste is limited to 5 or less households per week; or three trips or less per week from a commercial establishment.*

Municipal solid waste means solid waste generated from domestic and normal commercial sources. By way of example this includes garbage, rubbish, and refuse. It also includes front end process residue from the processing of municipal solid waste. It does not include a residual which is used in a composting or utilization facility. Tires and construction/demolition debris are not considered municipal solid waste for the purposes of the transporter rule.

3. When is a license required?

The regulations separate non-hazardous waste into three categories. Category "A" includes special waste, construction and demolition debris (c/d), and tires. Category "B" includes all municipal solid waste which are not Category "A" waste. This typically is garbage, rubbish, and refuse from domestic and commercial sources. Category "C" is septage.

Chapter 411 of Maine's Solid Waste Management Regulations (06-096 CMR 411) defines the transport vehicle (also known as the conveyance) as the power unit, trailer, semi-trailer, or the container being transported. A license is required for any conveyance to haul category "B" waste where the vehicle has a gross vehicle weight of 10,001 pounds or more.

A license is required to haul construction and demolition debris for any vehicle with a gross vehicle weight of 26,001 pounds or more. Transporters are exempt from a license for hauling inert fill or landclearing debris or recycling material. There is no conveyance weight exemption for the transport of septage, tires, and special waste.

4. *How do I obtain a license?*

You need to file a complete application with the Department. Application packages are available from the Augusta office. A complete application must include:

- the type of waste being transported;
- a photocopy of the conveyance's registration, or serial number if it is a trailer;
- a certificate of insurance with DEP as a certificate holder;
- a disclosure statement of the applicant's history for the last five years relating to any environmental violations, final judgements, and/or administrative orders relating to the handling of waste; and
- an application fee.

Generally, a license can be issued within 14 days upon receiving a complete applicaiton. Licenses are valid for two years. Fees are based on the number of conveyances licensed. The first and second conveyances are $100 each; the third through the tenth conveyance are $70 each; and the eleventh conveyance and on are $50 each. The maximum biennal fee for any applicant is $2000. The regulations require an application for the renewal of a license must be submitted a minimum of 30 days prior to the expiration date of the current license.

5. *When must a licensed non-hazardous waste transporter "manifest" the waste hauled and what is a "manifest"?*

Any licensed (categories A or C) non-hazardous waste transporter hauling tires, construction and demolition debris, special waste, or septage is required to manifest their waste. A manifest is a three page document which the transporter fills out and covers the transport of the waste between two locations. The manifest will describe the type and quantity of the waste, name and location of the generator, and the name & location of the receiving facility. Legible copies of all manifests are submitted to the Department on a quarterly basis by the transporter.

A licensed transporter can be exempt from filing manifests with the Department if the disposal facility accepting the waste is required by its license or regulation to maintain records and to report the quantity and source of the waste received to the Department.

6. Are there any additional requirements/conditions which I must follow as a licensed non-hazardous waste transporter?

- a decal is issued for each vehicle licensed. It must be prominently attached to the driver's side window;
- the license must be kept with the conveyance during all operations except for transport by rail;
- all non-hazardous waste transported must be properly contained during transportation to prevent a discharge to the environment;
- all non-hazardous waste transported within the State of Maine must be transported to solid waste facilities which are duly licensed or are exempt from licensing;
- department staff or a public safety or law enforcement officer have the authority to inspect the conveyance including the non-hazardous waste transporter license and manifest;
- all spills or discharges shall be properly cleaned up. If the non-hazardous waste spilled exceeds 0.5 cubic yards of solid or special waste or twenty gallons of septage, it must be reported to the Department. Within 5 working days of the date of the spill or discharge, the transporter shall notify the Department in writing. The letter of notification shall describe the spill or discharge, how it was cleaned up, and where it was ultimately disposed of; and
- the transportation of asbestos-containing waste materials or asbestos contaminated waste shall be containerized, stored, and transported in accordance with Department regulations. Asbestos is further described in statute and Department regulations as a special waste. Further information can be obtained from the Department's Asbestos Coordinator at *(207) 287-2651* or by writing to: *Asbestos Coordinator, DEP, State House Station 17, Augusta, Me 04333*.

nonhaz/nhtrain

Licensed Commercial Solid Waste Facilities
Serving Maine

LANDFILLS	
MidCoast Corporation Union Street Rockport/Camden Contact: Gary Leighton (207) 236-7958 (non profit corporation but accepts CDD outside 4 town region for tipping fee)	CDD
Sawyer Environmental Recovery Facility 358 Emerson Mill Road Hampden, Maine 04444 Contact: Scott Hagemeyer/Bill Murdock (207) 862-4200	Special Wastes Tires White Goods Demolition Debris
Waste Management Disposal Services of Maine - Crossroads PO Box 629 Norridgewock, Maine 04957 Contact: Paul Burns 1-800-562-7779	MSW Special Wastes Demolition Debris Asbestos
Consumat SANCO Inc. 501 South Street Box E Bow, NH 03304 Contact: Michael Viani 1-603-225-0579	MSW Demolition Debris Special Wastes
Turnkey 97 Rochester Neck Road PO Box 7056 Gonic, NH 03839 Contact: Gary Boucher or Joyce Gauthier 800-847-5303	Asbestos – MSW Special Wastes Tires - White Goods Demolition Debris
INCINERATORS	
Maine Energy PO Box 401 Biddeford, Maine 04005| Contact: Matt Hughes (207) 282-4127	MSW Special Wastes
Penobscot Energy Recovery Corporation PO Box 96 Orrington, Maine 04474 Contact: Hadley Jordan or Carlo White (207) 825-4566	MSW
Regional Waste Systems Inc. 64 Blueberry Rd Portland, Maine 04102 Contact: (207) 773-6465 (quasi-municipal but accept commercial waste)	MSW

TRANSFER STATIONS	
Andino, Inc. 132 North Street Houlton, Maine 04730 Contact: Andrew Marino (207) 532-6383	MSW White Goods - Tires Demolition Debris
Cheshire Sanitation Maple Street West Paris, ME 04289 Contact: Robert Magnusson (207) 883-6837	MSW
Eastern Maine Recycling Inc. PO Box 787 Southwest Harbor, Maine 04679 Contact: Lee Worcester (207) 244-9033	MSW White Goods - Tires Brush - Demolition Debris
HAPCO Farms Inc. PO Box 121 Fort Kent, Maine 04744 Contact: Robert Berube 1-800-848-9236	MSW
Riverside Bulky Waste Transfer Station City of Portland Riverside St Portland, Maine 04101 Contact: Eric Higgins (207) 797-6200 (municipal but accept commercial waste)	Construction/Demolition Debris White Goods - Tires Brush - Yardwaste
White Knight RFD 1 Box 611 Oakfield, Maine 04763 Contact: David Condon (207) 757-8594	MSW & CDD

PROCESSING FACILITIES	
Aggregate Recycling Corporation PO Box 363 Eliot, Maine 03903 Contact: Brian Kittredge (207) 773-1957 or (207) 439-5584	Oil Contaminated Soil
Archie's Inc. 344 River Road Mexico, Maine 04257 Contact: Alan Archibald (207) 364-2425	Clean Woodwaste
Arthur Schofield, Inc. 18 Oakland Road Fairfield, Maine 04937 Contact: (207) 453-8543	Bark & Woodchip
Beaulieau Industries 1225 Sabattus Street Lewiston, Maine 04240 Contact: Roger Beaulieau (207) 783-7663	Bark & Clean Woodwaste
Blue Rock Industries PO Box 9002 Westbrook, Maine 04098-5002 Contact: John McGrath (207) 854-2561	Pozzagonic Coal Fly Ash

Commercial Recycling Systems 2 Gibson Road Scarborough, Maine 04074 Contact: Bill Garland (207) 883-3325	Virgin Oil Contaminated Soil Special Wastes - ShinglesConstruction/Demolit ion Debris - White Goods
Cousineau Lumber, Inc. PO Box 260 Strong, Maine 04983 Contact: (207) 684-4444	Woodwaste
Cummings Concrete Inc. RR 1 Box 334 Old Town, Maine 04468 Contact: (207) 989-8363	Wood-Fuel Fly Ash
Dragon Products Co. US Route 1 PO Box 191 Thomaston, Maine 04861 Contact: Ann Thayer (207) 594-5555	Oil Contaminated Soil
Grimmel Industries R-1 Box 234 Topsham, Maine 04086 Contact: Gary Grimmel (207) 729-1691	Scrap Metal - White Goods Demolition Debris Ash Processing
Harry C. Crooker & Sons, Inc. Route 196 PO Box 5001 Topsham, Maine 04086 Contact: Frank Crooker or Dick Morgan (207) 729-3331	Virgin Oil Contaminated Soil
Hughes Bros. Inc. 719 Main Road North Hampden, Maine 04444 Contact: Edward J. Hughes (207) 942-4606	Coal Fly Ash in Redi-mix Concrete
J.P. Routhier & Sons, Inc. 256 Ayers Road Littleton, MA 01460-1010 Contact: Paul Routhier (978) 772-4251	Used Tires
Jolly Farmer Products PO Box 527 Poland Spring, Maine 04274 Contact: Sid Malone 1-800-879-2275	Bark - Clean Woodwaste
Kevlaur Industries, Inc. Champlain Street Van Buren, Maine 04785Contact: (207) 868-2761	Bark Mulch
KTI310 Cottage Road Lewiston, Maine 04240 Contact: Ron Ozalarski (207) 783-2941	Construction/Demolition Debris Oversized & Bulky Waste
Lane Construction Corporation PO Box 103 Bangor, Maine 04402 Contact: W. J. Kemm III (207) 945-0850	Virgin Oil Contaminated Soil
Maine Metal Recycling PO Box 1478 Auburn, Maine 04211 Contact: Dave Murphy (207) 786-3531 ext 15	Scrap Metal White Goods – Cars Used Tires – CDD Bulky Waste

Marriner's Inc. PO Box 600 Rockport, Maine 04856 Contact: Milford Thomas (207) 236-4317	Virgin Oil Contaminated Soil
PR Russell, Inc. RR 2 Box 9050 Richmond, Maine 04357 Contact: Mark Woodbury or Peter Russell (207) 737-8543	Bark and Clean Woodwaste
R.I.D., Inc. PO Box 121 Bath, Maine 04530 Contact: George MacDonald (207) 443-3217	Bark and Woodwaste
R.J. Grondin & Sons 11 Bartlett Road Gorham, Maine 04038 Contact: Phil Grondin (207) 854-1147	Stump Grinding Asphalt/Concrete Recycling
Robert Wardwell & Sons, Inc. PO Box 730 Bucksport, Maine 04416 Contact: (207) 469-3872	Bark & Woodwaste
Saco Steel Company Lund Road PO Box 187 Saco, Maine 04072 Contact: Mike Zaitlin (207) 284-4516	Scrap Metal Processing White Goods - Cars
Seaward Corporation 66 Dow Highway, Rt. 236 Eliot, Maine 03903 Contact: Paul Chase (207) 439-5974	Tires
Shaw Brothers Construction, Inc. Rte. 237 PO Box 69 Gorham Maine 04038 Contact: Danny Shaw (207) 839-2552	Stump Grinding
Thomas DiCenzo, Inc. PO Box 404 Calais, Maine 04619 Contact: Robert R. Bailey (207) 454-7538	Virgin Oil Contaminated Soil
Tilcon Maine, Inc. PO Box G Medway, Maine 04460 Contact: David Bess (207) 746-5636	Virgin Oil Contaminated Soil
Tilcon Maine, Inc. Bishop Street PO Box 1560 Portland, Maine 04104 Contact: Jonathan Oakes (207) 676-9973	Virgin Oil Contaminated Soil
Vaughn Thibodeau & Sons 119 Coles Corner Road Winterport, Maine 04496 Contact: Michael Thibodeau (207) 223-4279 or (207) 567-3444	Coal Fly Ash in Redi-mix Concrete

William Kitchen PO Box 80 Costigan, Maine 04423 Contact: (207) 827-2450	Wood and Bark Mulch