effectively eliminate, or severely restrict, the land application of biosolids and residuals, thus forcing them to be landfilled. (CO, MEWEA. LAWPCA-Richardson)

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83. Comment. The commenter understands the rationale for the change in Appendix A from screening levels based on the Department's RAGs to levels primarily based on U.S.E.P.A.'s RSLs. However, the commenter strongly recommends removal of PFBS, PFOA and PFOS from Appendix A because inclusion of these three chemicals could disrupt the agronomic utilization of biosolids and other residuals, "a highly valuable and successful recycling program on which most Maine communities rely". The commenter states it has been a national leader in proactively assessing and addressing concerns about these three chemicals conveyed in biosolids, paper mill residuals and other residuals, and it has considerable data and research literature on the topic. The commenter states the 3 chemicals are ubiquitous in society and the environment, and thus the three chemicals are present in biosolids and other residuals. It expects the levels of PFOA and PFOS in residuals to exceed the proposed Appendix A level, and they may be exceeded in food waste residuals, compost and digestate. The commenter shares the concerns expressed in comment #82 about the methodology for analysis of the chemicals, and notes that the chemicals present significant issues for modeling of leaching in soils. The commenter states robust analysis and risk modeling for the three chemicals is not possible at this time, and is concerned that the Department may be forced by stakeholders to apply the Appendix A screening levels to biosolids and other residuals. (NEBRA)

Combined Response. The Department disagrees that there are insufficient data to complete modeling of leaching of perfluorinated alkyl substances (PFAS). The U.S.E.P.A. has published default national screening levels for the PFAS perfluorobutane sulfonic acid (PFBS) using the soil-to-groundwater leaching pathway. The U.S.E.P.A. makes available all the parameter inputs needed for computing soil screening levels for PFOA and PFOS using the U.S.E.P.A. RSL calculator. There is also a published peer-reviewed scientific paper that has proposed soil screening levels for PFOA and PFOS of 3 ppb using methods similar to U.S.E.P.A. RSL equations (see Xiao et al., Water Research, 72 (2015):64-74). While the Department agrees that there is uncertainty and variability in Koc values used for modeling in the soil-to-ground water pathway, there is uncertainty and variability in many input parameters for risk assessment and decisions are routinely made to select conservative values to represent a reasonably maximum exposure. The Department is relying on U.S.E.P.A. to determine appropriate default values for Koc. The U.S.E.P.A. default Koc values are 115 L/kg for PFOA and 372 L/Kg for PFOS. NEBRA describes a 2013 scientific paper that supports higher Koc values (631 L/kg for PFOA and 1,000 L/kg for PFOS). However, the Maine CDC has identified

a more recent 2015 publication that supports use of Koc values of 96 L/Kg for PFOA (essentially same as the current U.S.E.P.A. default) and 710 L/Kg for PFOS (less than 2-fold higher than U.S.E.P.A.'s default value) intended to be more representative of soils with a broad range of organic carbon content (J. Milinovic et al. / Science of the Total Environment 511 (2015) 63–71). Use of these Koc values would not have a significant impact on the PFOA screening level and only a modest impact on PFOS (approximately a 2-fold increase). U.S.E.P.A. RSL methodology has its own soil-to-groundwater equations for modeling the soil leaching scenario that could have been used as a basis for a screening level rather than the Department's use of SESOIL. This U.S.E.P.A. RSL approach would yield a lower screening level than that obtained using SESOIL, even when using the alternative default dilution attenuation factor of 20.

The Department agrees with the comment that the proposed screening levels for two of the three proposed PFAS are unnecessarily low, and will increase the screening level for PFOA from 0.2 ppb to 2.5 ppb and for PFOS from 0.66 to 5.2 ppb. In response to comments, Maine CDC reviewed the derivation of the screening levels for PFOA and PFOS. In developing the proposed screening levels for PFOA and PFOS, Maine CDC applied one-half the U.S.E.P.A. health advisory of 70 parts per trillion (ppt) as the target water concentration rather than a solely risk-based tap water value (201 ppt) derived using U.S.E.P.A. RSL methodology. The U.S.E.P.A. health advisory was derived using a default "relative source contribution (RSC)" term of 20%, that effectively allows only 20% of allowable exposure to come from drinking water ingestion (allowing 80% to come from other sources such as diet, household dust, etc). For all other Appendix A screening levels based on the soil-to-ground water pathway (except MTBE), and including the PFAS perfluorobutane sulfonic acid (PFBS), Maine CDC used target water levels derived using U.S.E.P.A. RSL methodology for the residential tap water exposure route without application of an RSC. Maine CDC has recently evaluated background exposure to PFOA and PFOS using national biomonitoring data and does not believe an RSC any lower than 80% is needed in most cases — and in fact Maine CDC has used an RSC of 80% in deriving an action level for PFOS in milk for the Maine Department of Agriculture, Forestry and Conservation. Therefore, for consistency with other Appendix A screening levels based on the soil-to-groundwater exposure route, the Department concurs with a recommendation from the Maine CDC to revise the proposed Appendix A screening levels for PFOA and PFOS based on risk-based tap water values derived using U.S.E.P.A. RSL methodology. The resulting screening values that meet the Chapter 418 risk standard are 2.5 ppb for PFOA and 5.2 ppb for PFOS. These values appear to be similar to mean values that have been found in New England biosolids. According to NEBRA, mean levels of PFOA and PFOS for New England biosolid products are 2.3 and

5.3 ppb respectively.[2] NEBRA also appears to support PFOA and PFOS levels in the range of 3 to 140 ppb as appropriate guidance values for cumulative loading of soils.[3]

Currently, the Department does not require that residuals proposed for utilization be analyzed for PFAS. Given the uncertainties and questions associated with these emerging contaminants of concern however, it is not possible at this point to know how policy may change in the future with regard to them.

84. Comment: The commenter, who worked with the Department to develop Appendix A of this rule, notes that 152 of the 165 chemicals listed in Appendix A are risk-based values derived using U.S.E.P.A. RSL methodology or a related process that links RSL methods with soil-to-groundwater modeling performed by the Department. However, for 13 of the Appendix A chemicals, the risk-based screening level was substituted with a risk management value of 5,000 mg/kg. These 13 chemicals have a ceiling cap of 10,000 mg/kg in the Department's RAGs, intended to establish an upper level of soil contamination at sites where the RAGs are used. The Department intended the use of one-half the 10,000 mg/kg ceiling to maintain consistency with the risk standard in this rule. The commenter recommends that the application of a one-half adjustment factor to a risk management ceiling level is not necessarily consistent with the risk standard of this rule, and that in some instances it would be advisable to base Appendix A screening levels on a risk-based level. The commenter identifies 6 chemicals for which it recommends a change to risk-based values for screening levels; these levels would be higher than 5,000 mg/kg, but less than 10,000 mg/kg, and would meet the risk standard of this rule. The 6 chemicals, and the recommended screening levels are: (CDC)

Methyl ethyl ketone (CAS # 78933)	5,460 mg/kg
Benzoic acid (CAS # 65850)	6,200 mg/kg
2,4,5-Trichlorophenol (CAS # 95954)	7,370 mg/kg
Dibutyl phthalate (CAS # 84742)	7,370 mg/kg
Ethyl chloride (CAS # 75003)	7,370 mg/kg
Styrene (CAS # 100425)	9,270 mg/kg

[2] NEBRA Fact Sheet & Talking Points for Per- and Polyfluoroalkyl Substances (PFAS) in Biosolids. V3 – May 10, 2017. Pg. 7: "Ongoing proactive sampling and testing of New England biosolid products and related media is finding concentrations of PFAS in biosolid products that are typical or at the low end of biosolids elsewhere, with mean concentrations of 2.3 and 5.3 ppb for PFOA and PFOS respectively."

[3] NEBRA Fact Sheet & Talking Points for Per- and Polyfluoroalkyl Substances (PFAS) in Biosolids. V3 – May 10, 2017. Pg. 8: "**What can biosolids managers do? Calculate cumulative application rates to determine potential soil levels.** The very limited literature on leaching potential has suggested that, based on the most conservative assumptions, minimal risk is likely if the concentration of PFOA and PFOS in soil is no greater than 3 ppb. However, other modeling suggests a reasonable maximum acceptable level may be as high as 140 ppb in soil. More research is needed, but this range of soil concentration values can serve as initial guidance for now."