

Research Proposal: Potential for PFAS Leaching & Runoff Impacts from Biosolids, Paper Mill Residuals, & Other Land Applied Residuals

Preliminary Research by University of New Hampshire for the New England & New York Region
December 15, 2017 DRAFT v. 1.1

Research begins with evaluation of historic land application sites by a Univ. of NH research team.

Beginning in early 2018, a team at the University of New Hampshire (UNH), led by Dr. Thomas Ballestero, with funding from the New Hampshire Department of Environmental Services (NH DES) and NEBRA, will begin to gather data to further advance understanding among stakeholders – including regulators and land application managers – in New England, New York, and other states regarding residuals that contain poly- and perfluorinated alkyl substances (PFAS), including perfluorooctanoic acid (PFOA), perfluorooctane sulfonate (PFOS).

This initial, northeast U. S. research is intended to help inform a future, larger national effort. It will ensure consistent and efficient evaluation of the core issue of potential PFAS leaching and surface runoff from land applied residuals. The goal is to then expand the effort to other states and involve university researchers and regulatory agencies (including funding) in those states (e.g. NY and VT initially).

This research will address the one fundamental question:

Does historic and current land application of wastewater residuals (paper mill residuals, municipal biosolids, etc.) represent a risk to public health from PFAS contamination of a) groundwater via leaching and/or b) surface water via runoff?

Past research and experience indicate that these are the only significant concerns related to PFAS conveyed in biosolids and other residuals. Other exposure routes involving PFAS in biosolids and residuals – including dermal contact, ingestion, or inhalation – do not present any significant risk to public health.

Cursory testing indicates a need for this research.

To date, regulators and other stakeholders have conducted cursory sampling for PFAS at a few biosolids and residuals utilization sites in Northeast states. The resulting, preliminary data indicate a need for further research. Limited published research corroborates the potential for groundwater and surface water impacts by PFAS conveyed in land applied biosolids and residuals. Concentrations of PFAS in waters potentially impacted by residuals have been reported at levels within the same order of magnitude as screening concentrations established in regulatory agency drinking water health advisories (e.g. the U. S. EPA public health advisory level for combined PFOA and PFOS in *drinking water*, which is 70 parts per trillion (ppt)).



Biosolids & residuals are recycled on farms, like animal manures, building healthy soils.



This research will be informed by a literature review, the experience of stakeholders, & ongoing communications.

The environmental and public health implications of PFAS are a rapidly developing field of interest worldwide. For the past year, NEBRA has been compiling information focused sharply on PFAS in biosolids and other residuals – including a literature review that is being provided to the research team. NEBRA will continue to ensure that the most current information is incorporated into the research protocols and report. NEBRA will also continue two-way communications with stakeholders – including Northeast region regulatory agencies – regarding this research. Through this facilitation, the research project will benefit from the most current scientific knowledge.

Assessing and controlling variables is critical. Because PFAS have been ubiquitous in society and the environment for decades, careful assessment and control of variables and potential cross-contamination will be required. To date, the data generated by cursory testing of a few residuals land application sites in this region are only useful for rough screening purposes. This research project will develop a robust, defensible protocol for site characterization, sampling, and analyses that can be replicated around New Hampshire, initially, and then across the region. This will produce quality data for comparisons from site to site and residual to residual. Careful analysis of multiple sites may eventually lead to a large enough data set to allow for teasing out the most significant variables.

Two especially critical aspects of the research will be the selection of an appropriate list of PFAS compounds for analysis and determination of analysis method(s). These aspects are in flux, and different states are using different target compound lists and relying on different analysis methods. NEBRA and the research team will integrate the latest information on these aspects into this research.

Phase I research steps & timeline – Univ. of NH evaluations of NH sites

by January 2018 – Finalize start-up funding & contracts

by March 2018 – Evaluate and prioritize compiled list of NH land application sites; select four sites for full evaluation

by May 2018 – Secure landowner & stakeholder agreements, finalize QC sampling & analysis protocols, contract with laboratories, secure equipment, schedule field work

by July 2018 – Conduct field evaluations, install monitoring wells, sample waters & soils, submit samples for analysis

by October 2018 – Complete draft report

by November 2018 – Complete final report

Budget The total Phase I research effort will total \$66,000 in 2018: \$60,000 for the UNH research team and \$6,000 for NEBRA facilitation. NH DES and NEBRA plan to secure commitments for these funds by the end of January 2018. Contact NEBRA to assist and/or discuss: info@nebiosolids.org or 603-323-7654.



Liberty Park, NJ. Biosolids products are used in many places. These recycling programs create jobs & economic activity.

NEBRA is helping facilitate this research work as part of its efforts to proactively address PFAS concerns related to biosolids & residuals. During Phase I, NEBRA and other stakeholders, with the guidance of the UNH research team, will establish commitments from other states and university researchers, secure Phase II funding, review and revise protocols as needed, and advance Phase II evaluations of residuals land application sites in other states.

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