**Presentation title**

**Ten years of urine diversion development in the United States: findings and lessons learned**

Names of authors (bold and underline speaker\*)

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**Brief bio of lead CI/presenter**

Three sentences or 50 words max along with a small photo should be included.

The bio shall be used by the session chairs to briefly introduce the speakers.

Do need not write very long bio but just include who you are, your affiliation and your roles.

**Abraham Noe-Hays** is the Co-Founder and Research Director of the Rich Earth Institute, which operates the nation’s first community-scale urine recycling program, and conducts research relating to reclaiming resources from human waste. He is also the Chief Technology Officer of Rich Earth Tools, LLC, which develops technology for productive sanitation, particularly for concentrating and sanitizing source-separated urine and vacuum-flushed blackwater for fertilizer production.

**Abstract**

The Abstract should be 350 words maximum. Figures are not necessary.

Diverting urine from the wastewater stream can, in theory, constitute a more sustainable approach to wastewater treatment and fertilizer production. In practice, there are several critical aspects to navigate, including the cost and environmental impacts of collecting and processing urine, the incentives driving people to adopt urine diversion, and the farming context in which the fertilizer will eventually be used.

The Rich Earth Institute takes a practical approach to urine diversion, operating the first and largest community-scale urine-to-fertilizer program in the United States. Initiated in 2012 as an unfunded, grassroots project to collect urine for reuse on local farms, it has grown into a research and demonstration institute with a diverse program. Research topics include urine processing technologies, microcontaminant management, social acceptance, soil health impact, and factors affecting adoption by farmers.

Over the last ten years, we have come to several broad conclusions about the prospects for urine diversion:

There is much more enthusiasm for urine diversion than we initially expected. Individuals hearing about urine diversion for the first time frequently report personal interest in the concept, with the caveat that they do not believe that others will be as receptive. This difference between ascribed and actual attitudes appears to be widespread, and it seems that the United States public is much more receptive to the idea of urine diversion than people imagine.

A significant group of early adopters are ready to begin diverting urine, if participation is affordable. About 230 individuals currently participate in our urine recycling program, despite the lack of any financial incentive. Most urine donors use inexpensive, portable urine collection systems, and although many of these people would like to have a permanently-installed urine-diverting toilet, most are deterred by the cost, logistical complexity, and permitting requirements.

Urine diversion will be most readily adopted where the practical value justifies the expense and effort of adoption. These scenarios include:

1. Where urine meets an onsite fertilizer need, using minimal treatment and infrastructure
2. Where nutrient pollution is a problem and centralized treatment with nutrient removal is impractical
3. Where urine diversion can facilitate water reuse by reducing problematic dissolved solids