

Nutrient Removal Equipment Pilot Testing

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Note that the statements mentioned, and materials provided in this presentation reflect our own opinions and do not reflect the opinions of NOWRA.

Agenda

Purpose of Nutrient Removal



Equipment Tested



Pilot Studies



Preliminary Results

The Impacts of Nutrient Pollution



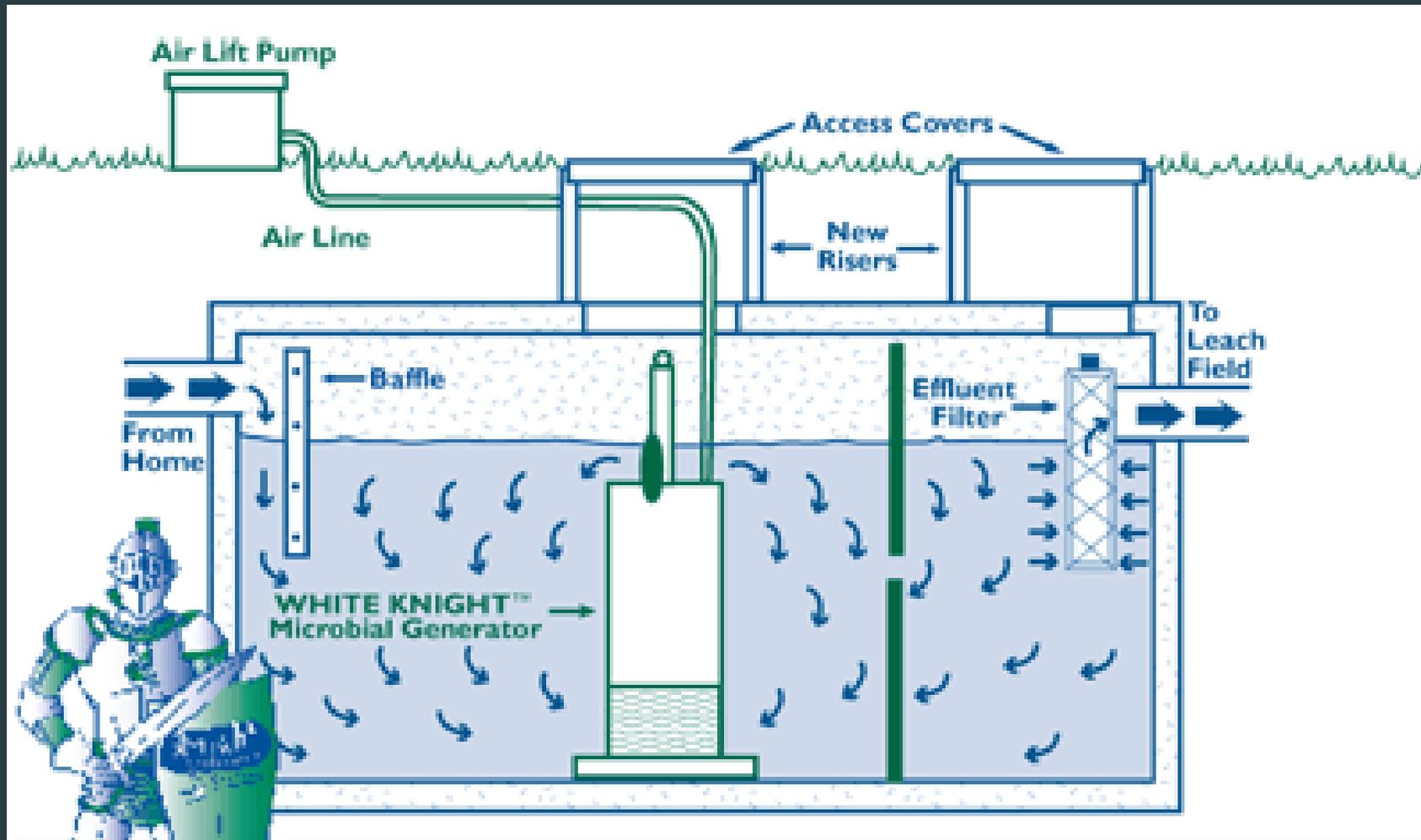
US EPA. (n.d.). *The effects: Environment*. Nutrient pollution.
<https://www.epa.gov/nutrientpollution/effects-environment>

Groundwater
Contamination

Hypoxia

Thick Muck in Water Bodies

Air Pollution



Microbial Inoculator Generator (MIG)



MIG Installation



Phosphorus Adsorption Device

- ▶ Vertical flow forced through channels
- ▶ Channels filled with media
 - ▶ Granular adsorptive media.
- ▶ Phosphorus adsorbed into media
- ▶ Added into existing septic tank or treatment tank after septic tank



Phosphorus Adsorption Installation

Slide 7

2018 Pilot Study



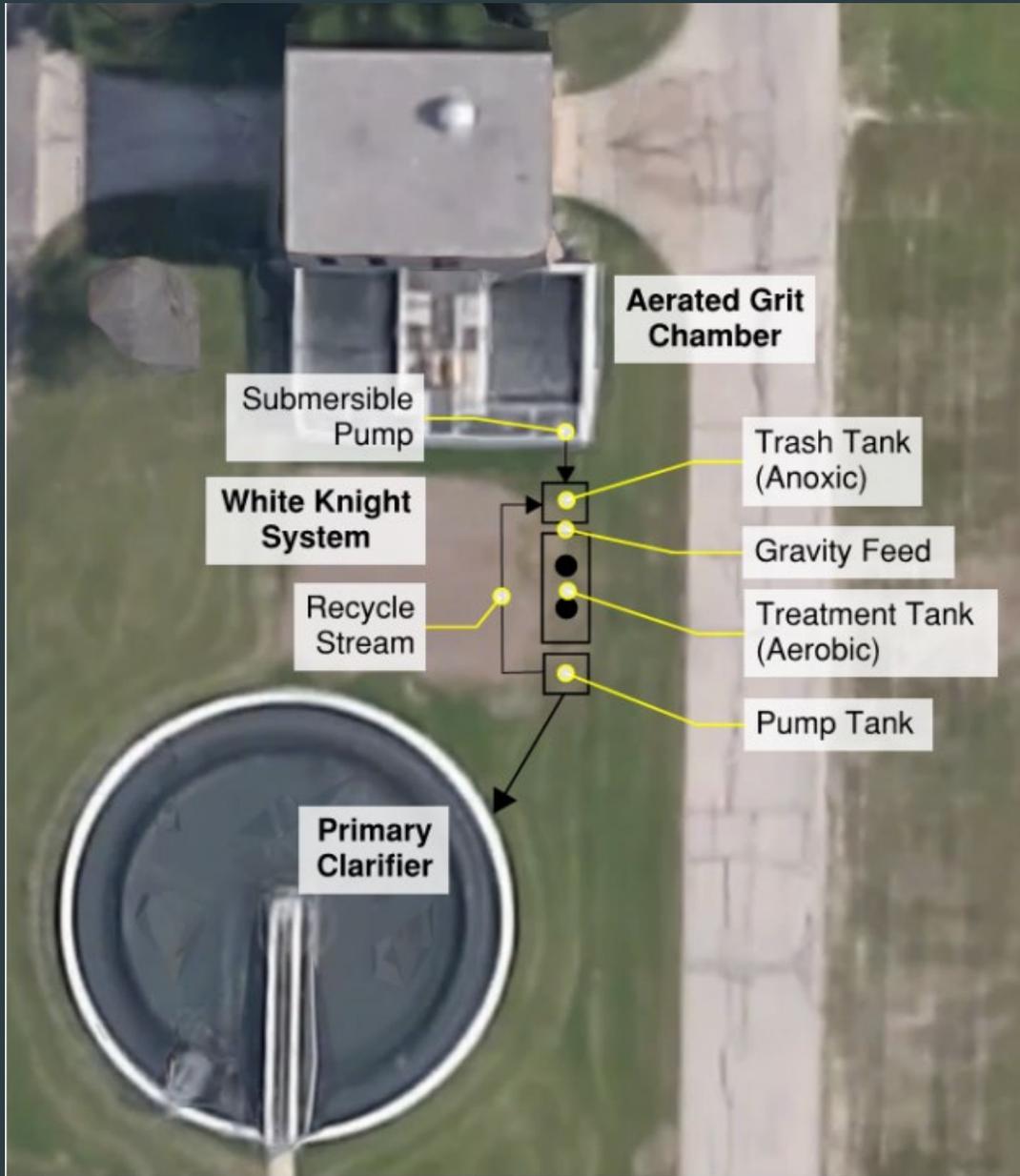
Oconomowoc Wastewater Treatment Facility



Microbial Inoculator Generator (MIG) W/ Recirculation



Goal of operation without supervision

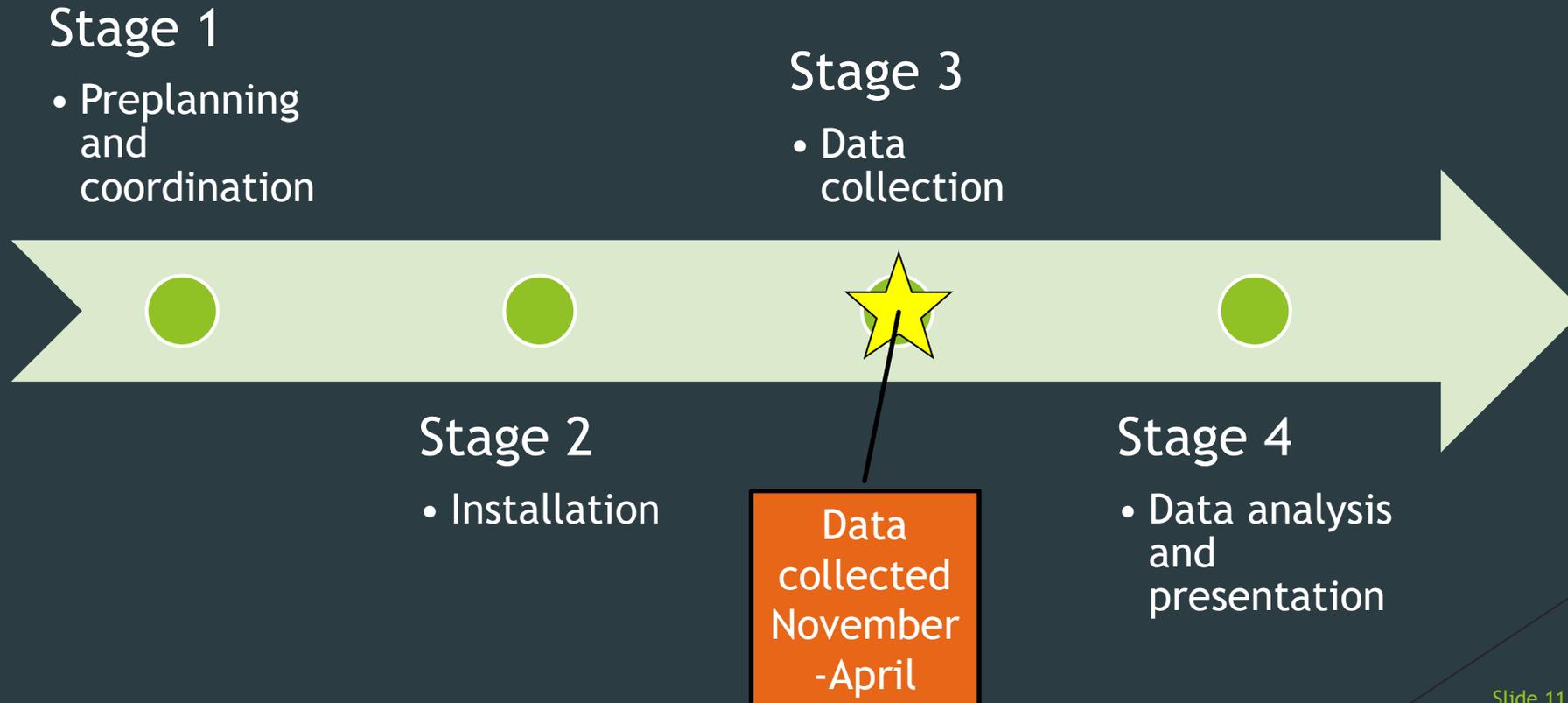


2018 Pilot Study Layout



2018 Pilot Study Installation Photos

2018 Pilot Study Timeline



2018 Pilot Study Complications



Temperature



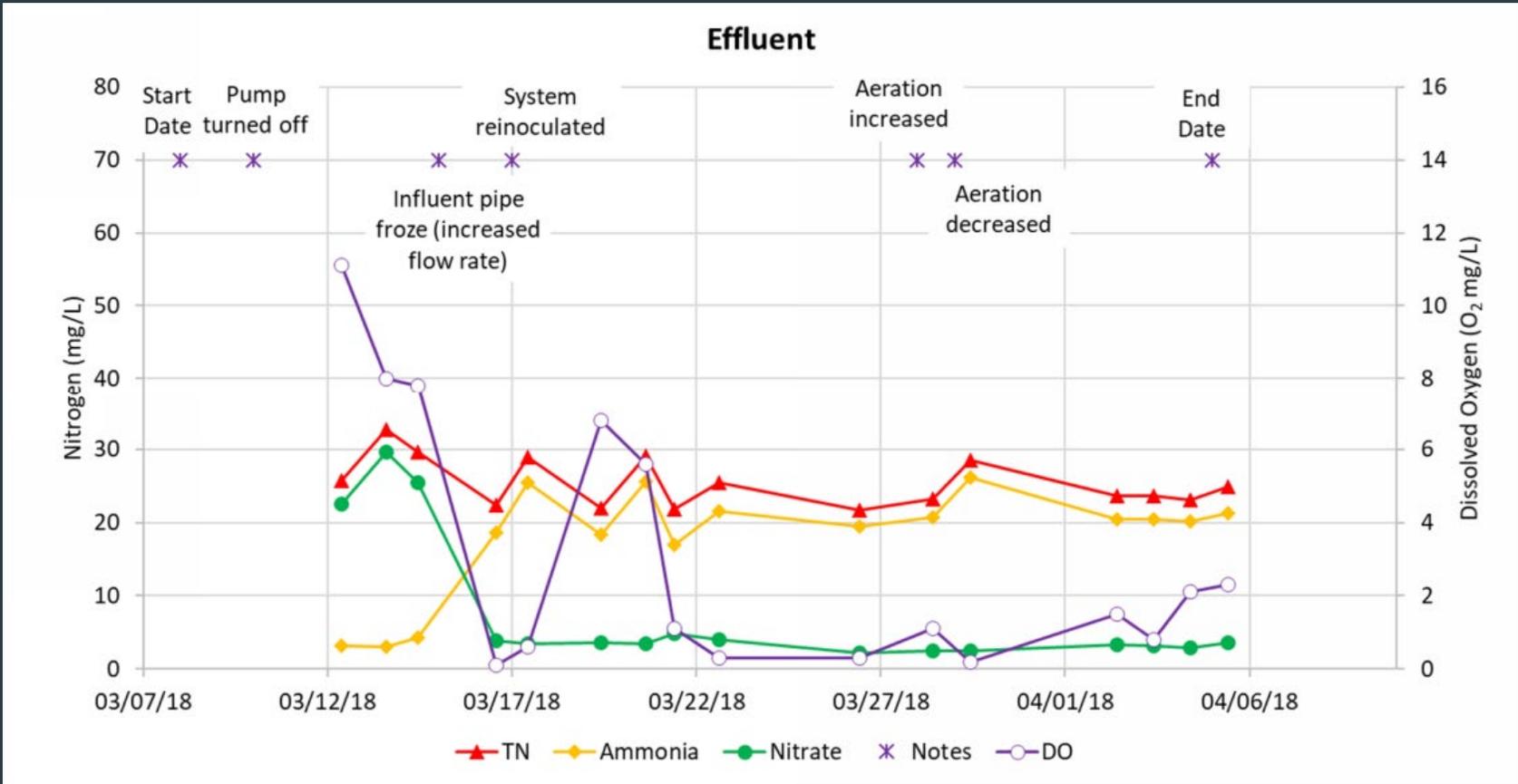
Limited Microbial Growth



Regular intervention Required



Short Period of Data Collection



2018 Pilot Study Results

Otsego Lake Watershed Pilot Study



Variety of technologies installed at four locations



Phosphorus Adsorption Device



Goal of operation without supervision



Otsego, NY Installation

Otsego Watershed Results



P removal ranged from 95% to 32% during the sampling across the P removal media



Best removal was at the two residences



The actual results exceeded the calculated removals.

2022 Pilot Study



Brookfield Wastewater Treatment Plant



Microbial Inoculator Generator (MIG) w/ recirculation



Phosphorus Adsorption Device

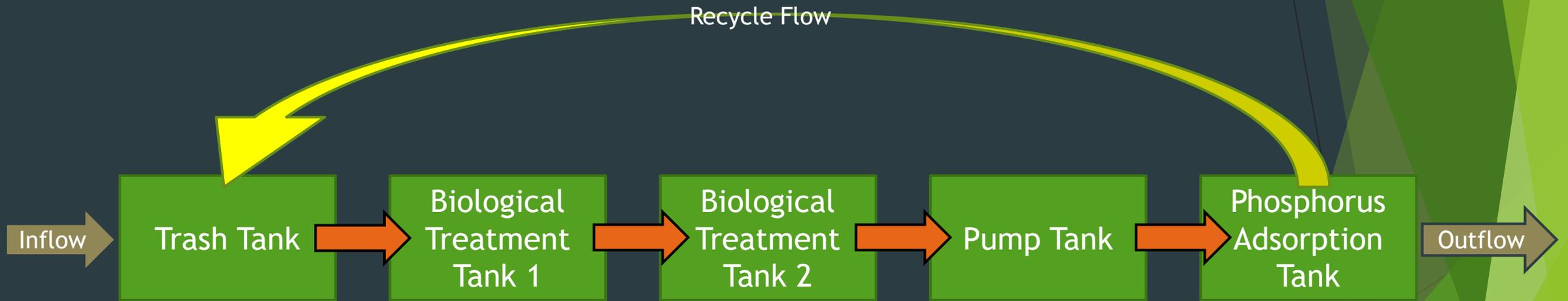


Goal of Operation Without Supervision

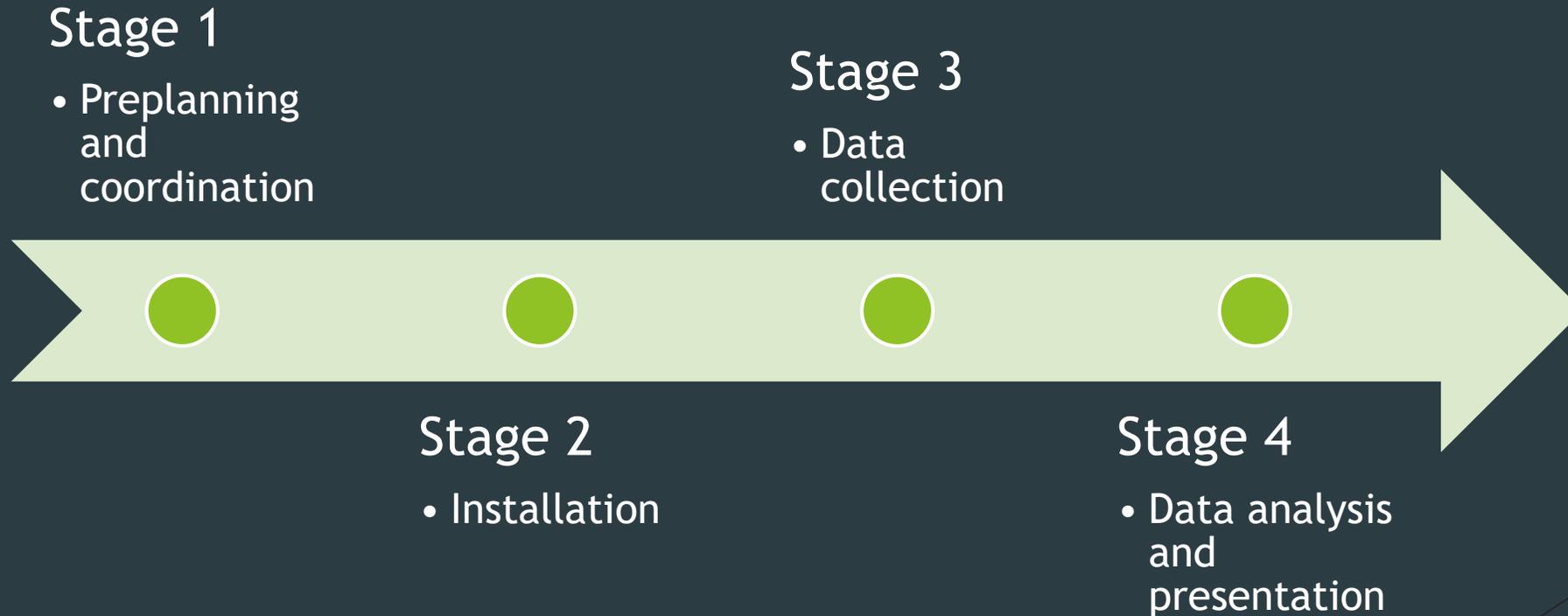


Long Period of Data Collection

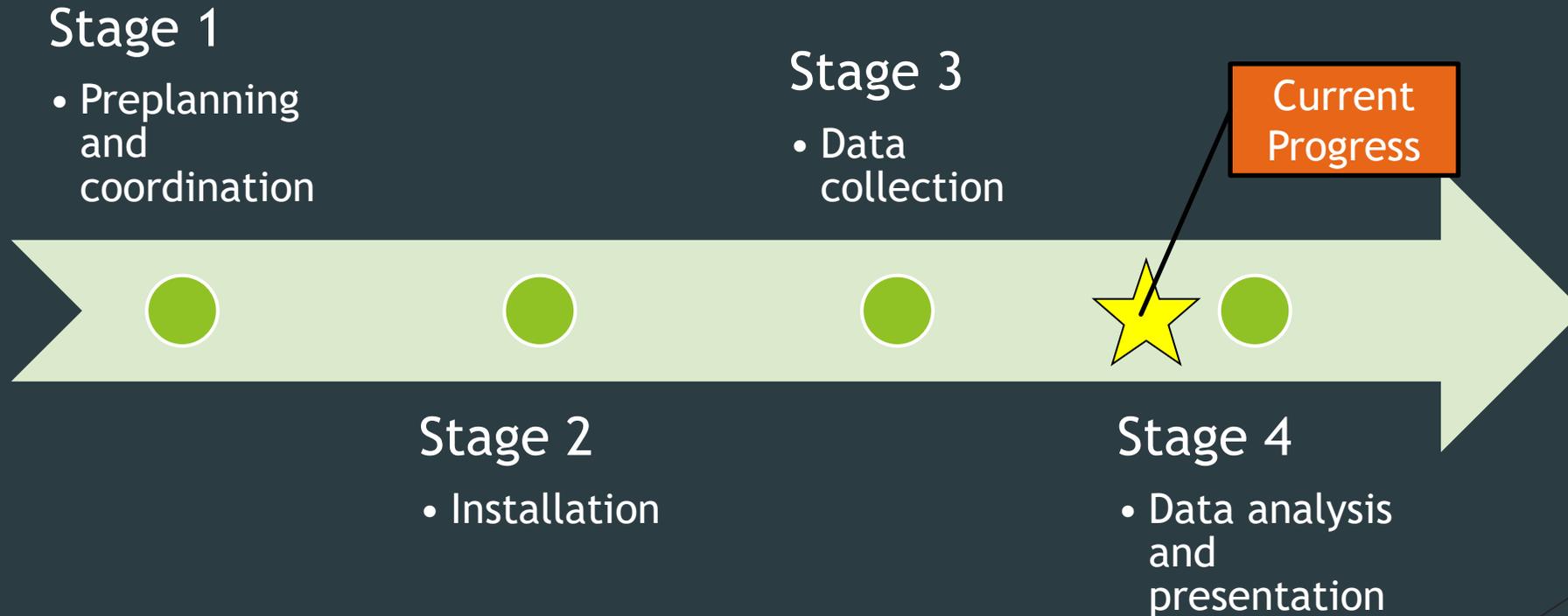
2022 Pilot Study Diagram



2022 Pilot Study Timeline



2022 Pilot Study Timeline





2022 Pilot Study Installation

Preliminary Results

Nitrification is at least
intermittent

Signs of denitrification in pump
tank

P removal unit installed 9/22/22

HUGE Thanks to:

- ▶ Rick Wentzel and the Staff at Oconomowoc WWTF
- ▶ Lakeshore Burial Vault for “loaning” the tanks
- ▶ Jeff MacDonald of Lab Technician at MSOE for being the “go to” guy
- ▶ Knight Treatment Systems, inc and First Supply, inc for donation of equipment
- ▶ The Water Council, Milwaukee, WI for financial support

Thank you!

We will now take any questions.