



**g**ainey's

**The same applies in Africa...  
Lord willing**

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BCEE**

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April 26, 2024**





**WHERE?**  
**05.4316° N 000.4769° W**

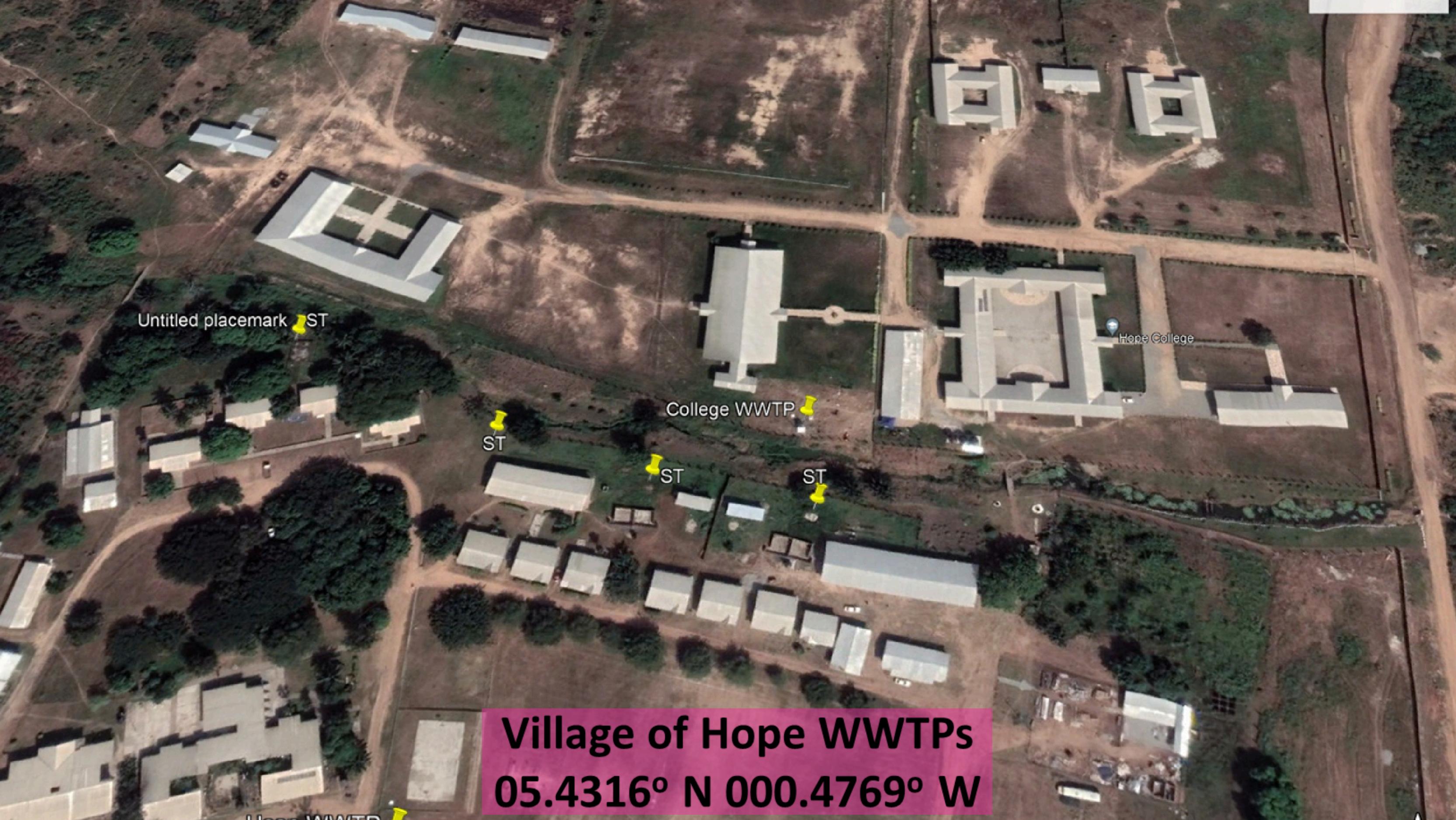
**WHERE?**

**05.4316° N 000.4769° W**

**Central Region**

**Gomoa Fettah**





Untitled placemark ST

Hope College

College WWTP

ST

ST

ST

**Village of Hope WWTPs**  
**05.4316° N 000.4769° W**

# WHY do you do what you do?

## *Ephesians 2: 8-9 and 10*

For by grace you have been saved through faith, and that not of yourselves, it is the gift of God; not as a result of works; so that no one may boast.

**For we are His workmanship, created in Christ Jesus for good works, which God prepared beforehand so that we would walk in them.**

Everlasting God,

Living well and doing good requires a wisdom beyond myself. Even well-intended attempts at doing good often result in unintended consequences that yield more misery than gain. Humble and help me to do good arises out of true faith, conforms to Your love, and is done for Your glory. Amen. *Seeking His Face*



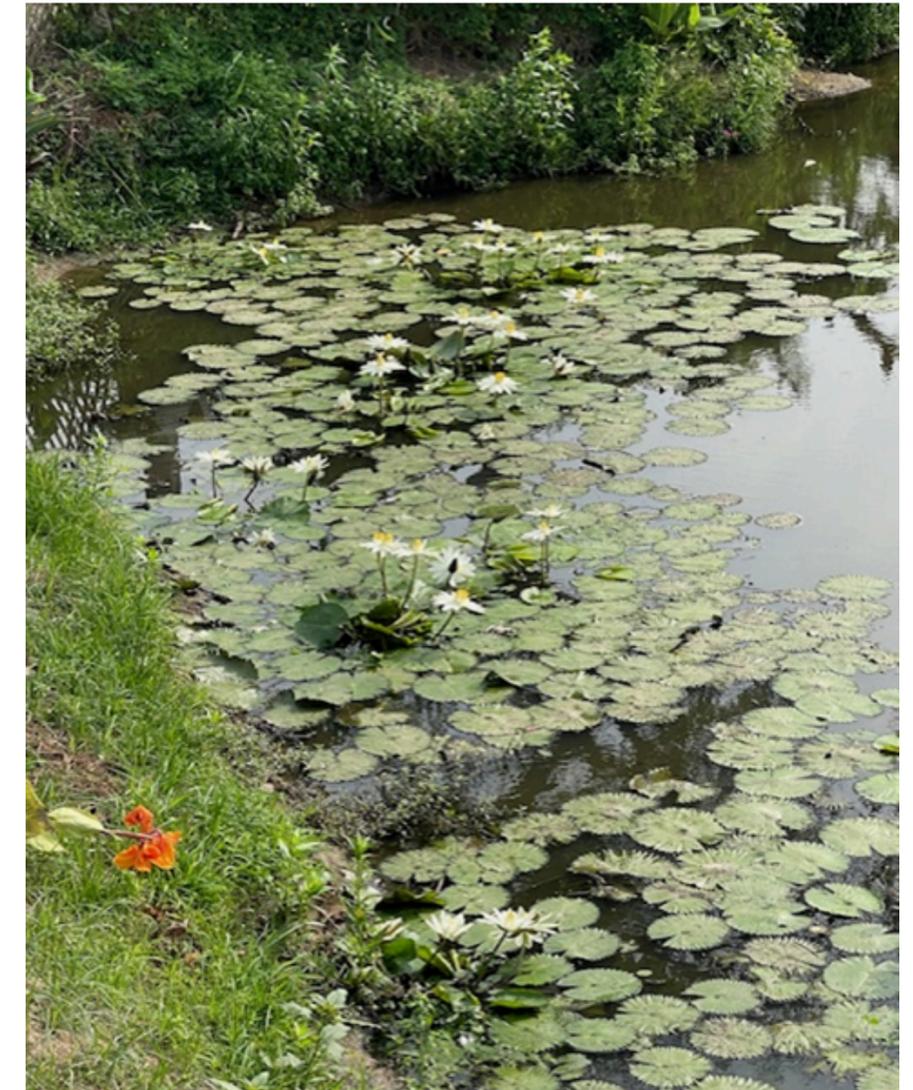
# HOW? The Peugeot Center for Engineering Support to Developing Communities at Lipscomb University, School of Engineering



- Why? Not only help developing communities but help graduating engineers appreciate the service aspect of engineering
- Relationship with church communities here and in Central Ghana and Lipscomb engineering school
- Not a one-time affair; on-going relationship
- Connections could result in long term tech transfer to Ghanaians and expansion of use in Africa
- Advance WW treatment in humanitarian efforts

# WHAT? Purpose:

- Reduce inadvertent discharge of septic effluent to surface water (streams).
- Reduce human exposure to septic effluent that does not percolate into the soil.
- Reduce pumping septic tank contents to holding areas “over there”.
- Help VoH be a good neighbor.
- THE WATER PRODUCED IS **NOT FOR DRINKING.**
- SECONDARILY TREATED WATER WILL BE DISINFECTED and suitable for landscape irrigation.**



# FOR? Village of Hope (Gomoa Fetteh, Ghana)

- Hope Childrens Village (Orphanage)
  - 242 children: nursery thru junior high school
  - House couples care for 10-12 children each
- Hope Christian Hospital & Clinic
  - Village Children + 4 surrounding counties
  - 76 beds for in-patient care; 60/day outpatients
- Hope Christian Academy:
  - 2 yr old à 9th grade: 504 students
- Hope College: 9th à 12th grade: 505 students
- Plus: staff; especially orphanage couples



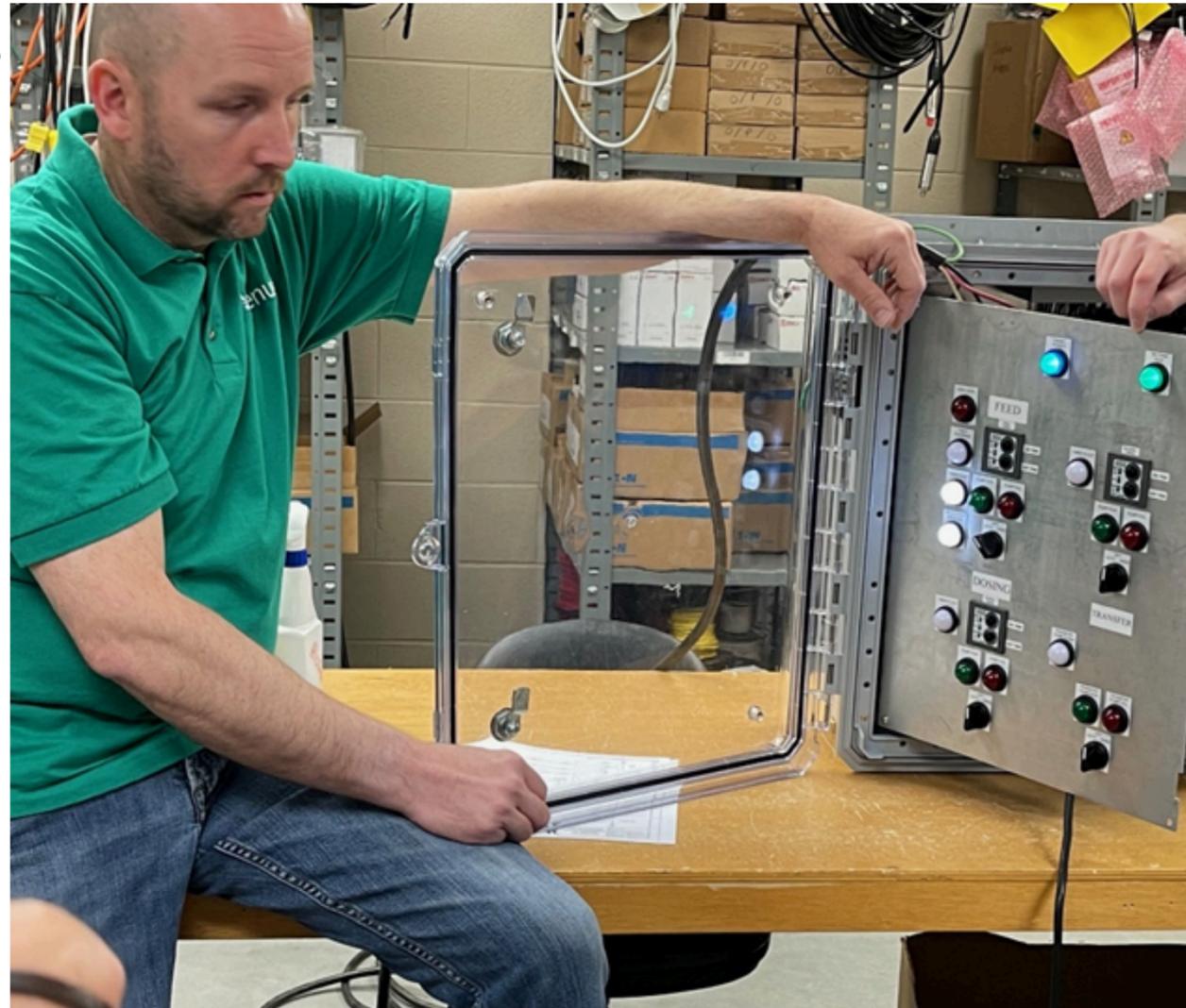
# WHO? Credit where due:

- Craig Lindell: **AquaPoint**; Bioclere empirical design information
- **Caleb Meeks PE**: 2018 & 2019 design & construction
- Jerry Cravens: **WASCON**: original 60Hz-110 V pumps and floats
- **Glenn Marcum**: **EcoStruct**: 2019 construction
- Bryan Bellar PE & **Adenus Technologies**: control system for 2023 conversion to 50 Hz, video troubleshooting and control changes 2024
- Ran Batson: **RBC**: 2023 construction
- TPC: students & sponsors

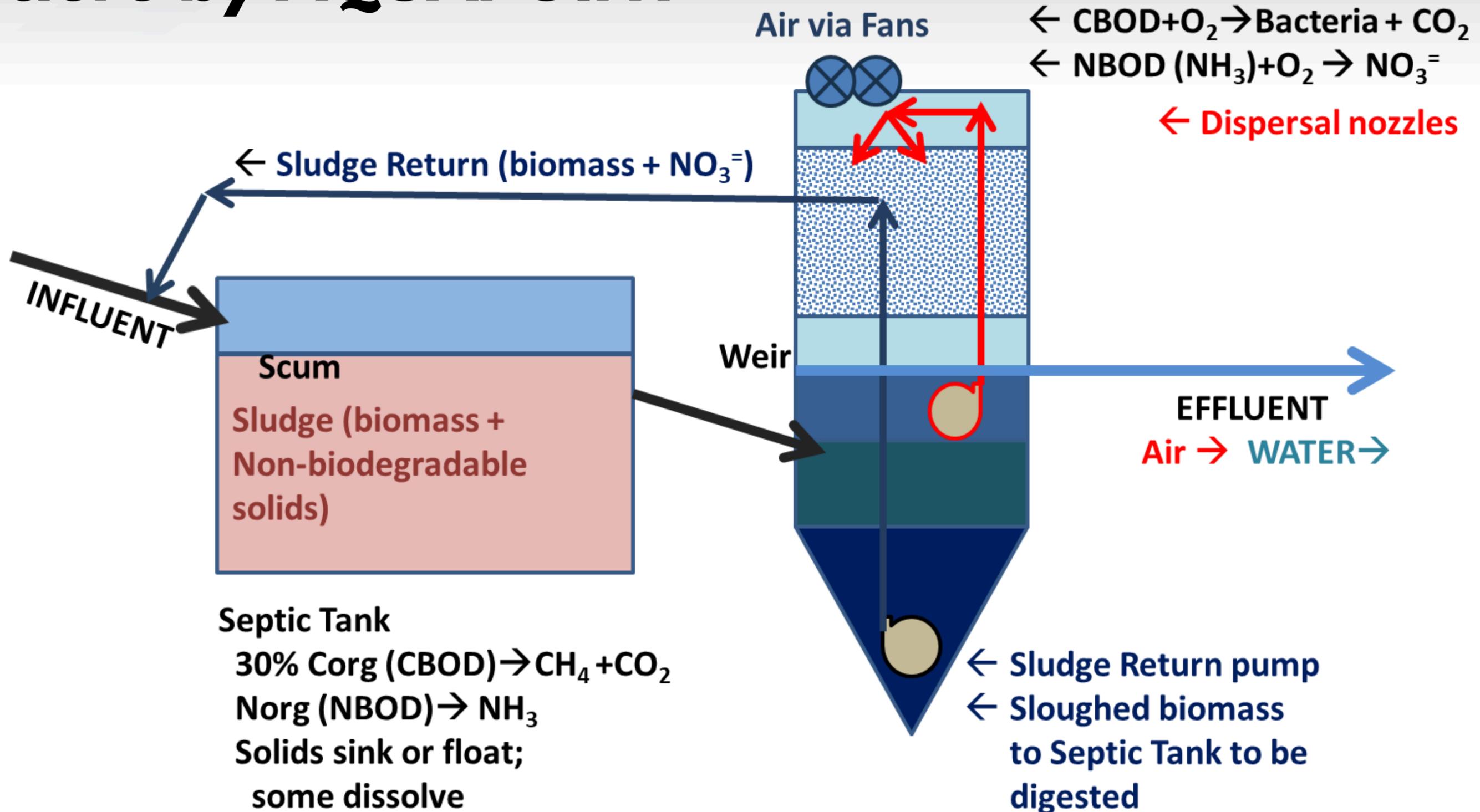


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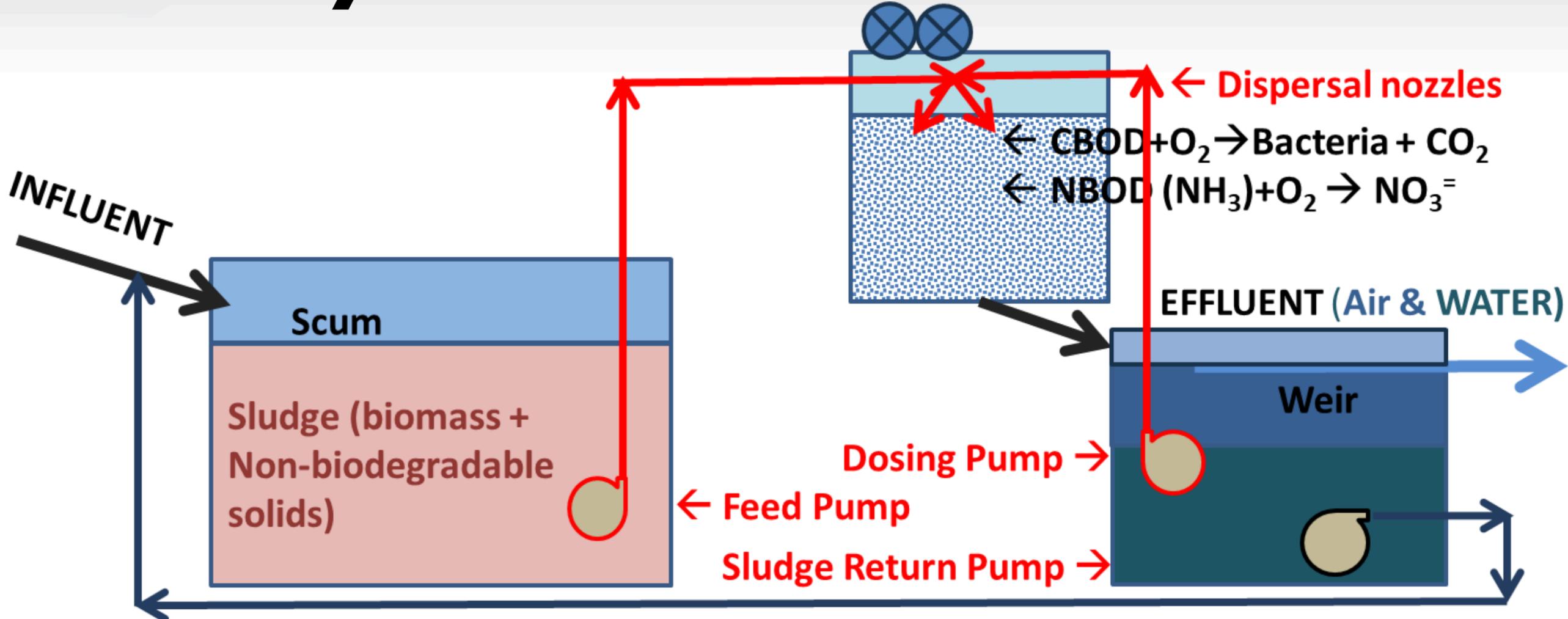
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# Bioclere by AQUAPOINT



# Bioclere...by...uh..us?



**Septic Tank**  
 30% Corg (CBOD)  $\rightarrow$   $\text{CH}_4 + \text{CO}_2$   
 Norg (NBOD)  $\rightarrow$   $\text{NH}_3$   
 Solids sink or float;  
 some dissolve

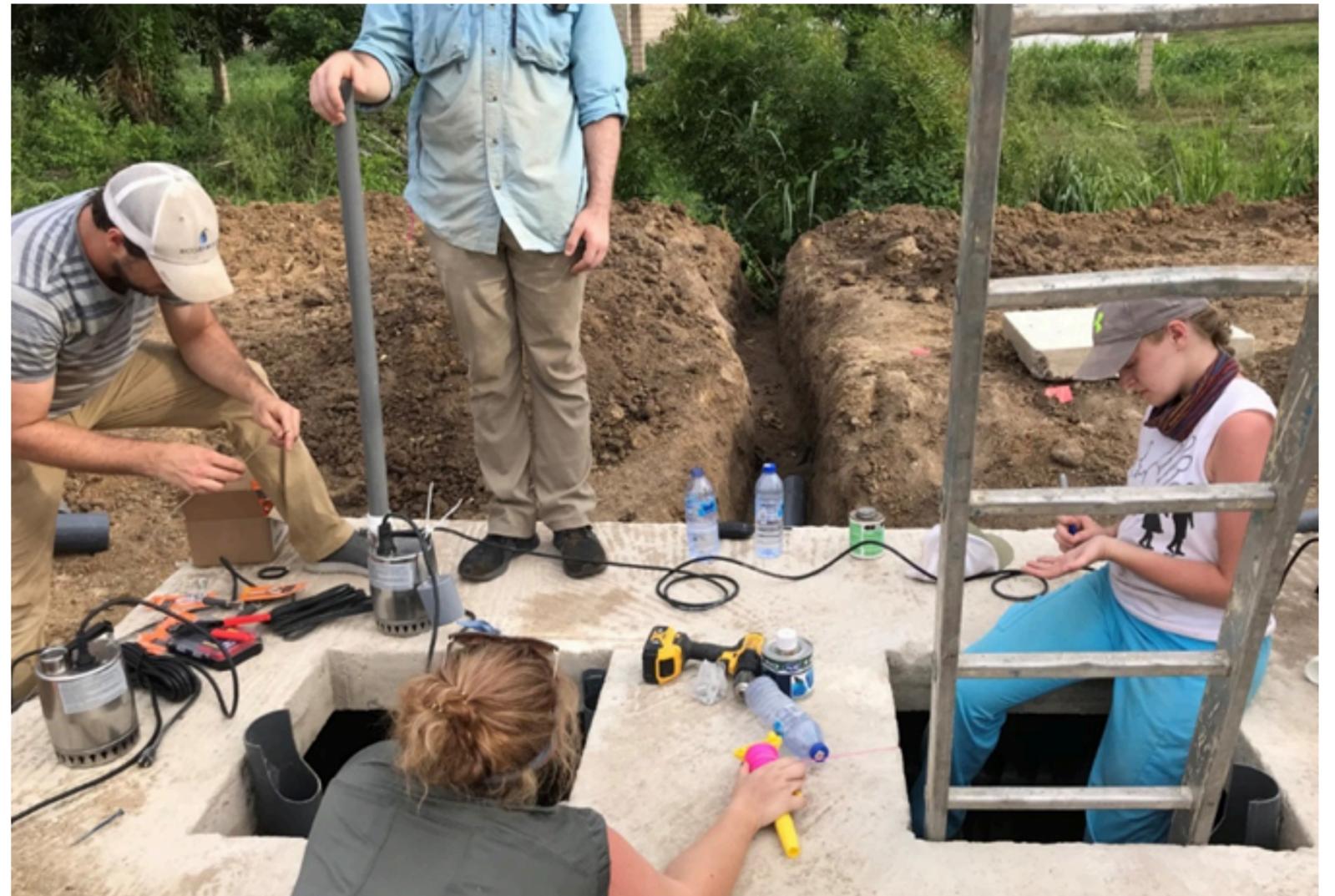
$\leftarrow$  Sloughed biomass to Septic Tank to be digested +  $\text{NO}_3^-$

## Where there is a will...college students will find a way

Turning 1.6 miles of vacuum cleaner tubing into 8 m<sup>3</sup> of media



**“Mad dogs and Englishmen go out in the noon day sun”  
(Noel Coward)**



Dec 2023

**Legend**  
● Hope College  
● ST



Untitled placemark ST

ST

College WWTP

ST

ST

Hope College

Hosp WWTP

Google Earth

Image © 2024 Maxar Technologies



200 ft

**gainey's**

February 2024

**Legend**

- 📍 Hope College
- 📌 ST

**"Over there"**

**SOCCKER FIELD**

Untitled placemark ST

College WWTP

**Guest Hses & Conf Cntr**

**SOCCKER FIELD**

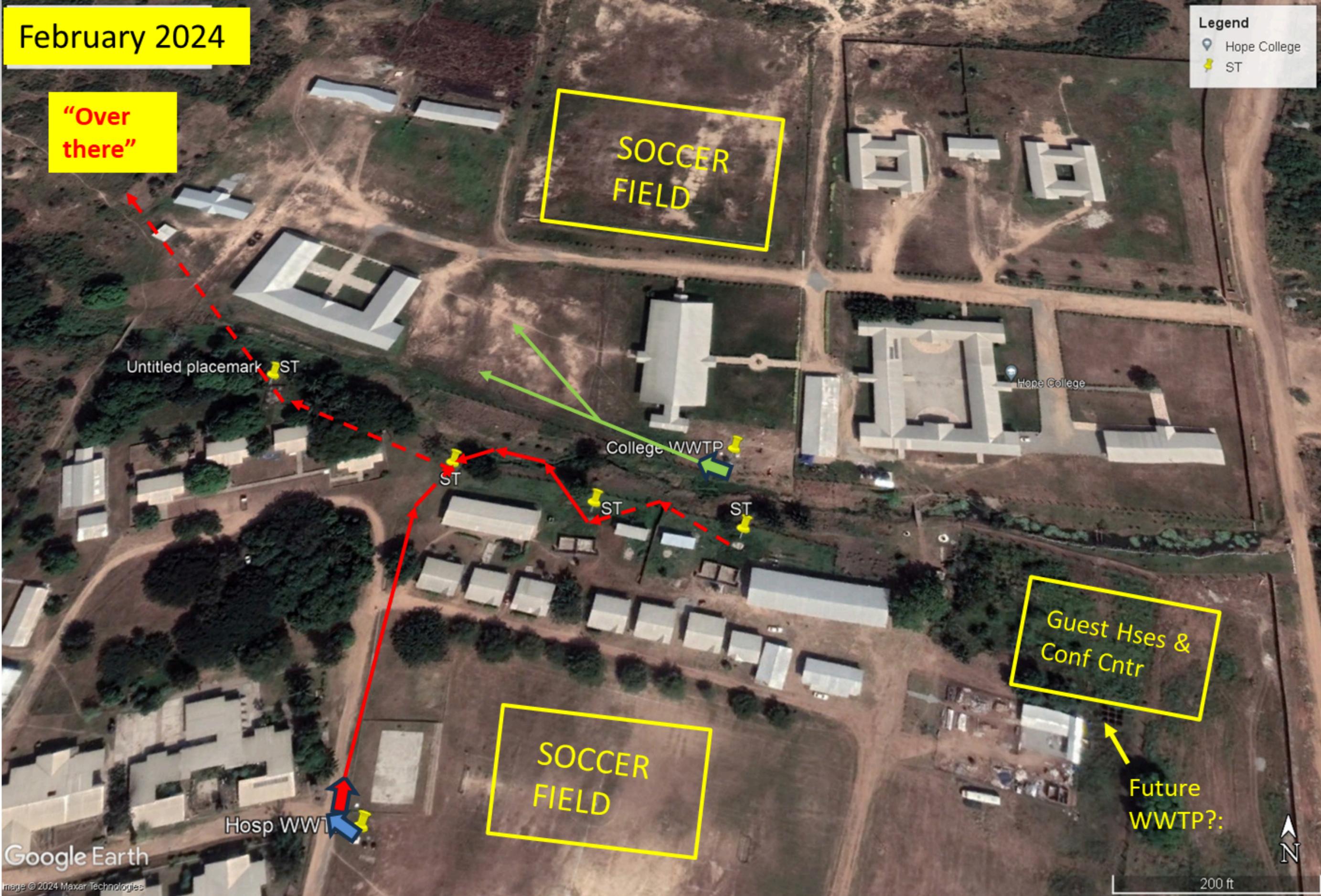
**Future WWTP?:**

Hosp WW1

Google Earth

Image © 2024 Maxar Technologies

200 ft



May 2024?

**Legend**

- Hope College
- ST

"Over there"

SOCCER FIELD

SOCCER FIELD

Guest Hses & Conf Cntr

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Future WWTP?:

College WWTP

Hosp WWTP

Future WWTP?:

SP1

SP2

SP3

SP4

GR1

PR1

TR1

TR3 TR4

PR3

FMR2

PR2

TR2

FM4

FM2

FMR1

Google Earth

Image © 2024 Maxar Technologies

gainey's

200 ft



# Lessons Learned

- Show respect → listen first
- Be sensitive → you do not understand their culture or environment; use the egret approach
- Involve them → create a partnership
- Keep it simple (at least START close to their technological comfort zone); but don't sell them short!
- Long distance emphasizes the importance of:
  - Communication: in our case → use WhatsApp; a picture/diagram/video is more often than not worth a thousand words
  - Reliability à sustainability → ***sine qua non***
  - Things will be different when you get there; their environment is evolving also; pack your patience



# Questions?



**Got a better caption?**

**What do we do with this part left over, Kemo Sabe?**