

## SUMMARY OF BETA-TESTING THE CUPSS MOBILE APP

In July of 2016, P3 intern David Hansen participated in the beta-testing of an app for the Check-Up for Small Systems (CUPSS) software that is currently being developed by the Water Innovation Network for Sustainable Small System (WINSSS). The app is the product of a collaboration between the Universities of Nebraska-Lincoln, Illinois, and Massachusetts. The app is intended to make populating, and updating CUPSS assets more convenient for operators at facilities.

CUPSS is a program that helps small facilities manage assets and infrastructure. It uses a risk matrix to prioritize replacement of machinery and infrastructure based on cost, and consequence of failure. The program also allows the facility to schedule maintenance and repairs. Currently, CUPSS users must collect information and enter it on a desktop computer. This process can be cumbersome for equipment that is remotely located.

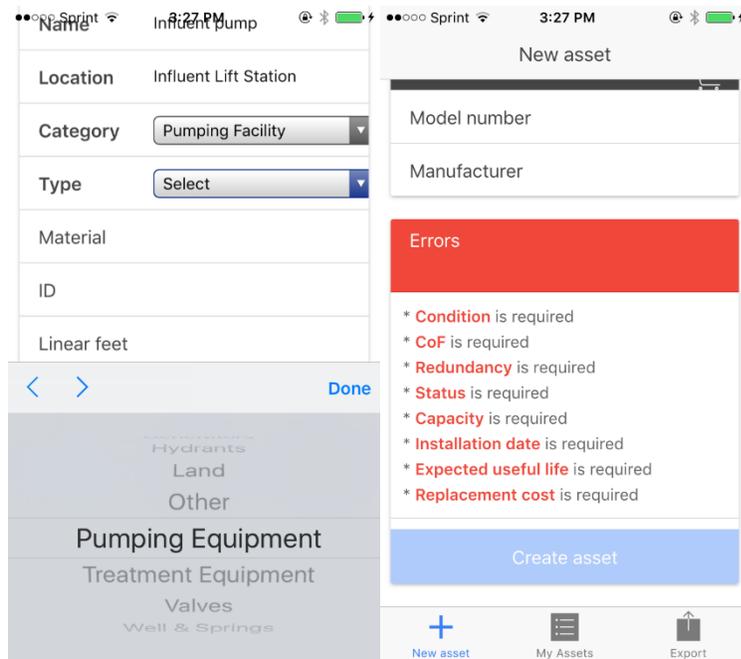


Image 1-Screenshots of the CUPSS mobile app in use.

Hansen tested the CUPSS app using an iPhone 5. Two screenshots of the app in use are shown to the left. As shown, assets cannot be created without all of the required information populated.

The testing was facilitated by a platform called Ionic View. All functions of the app were tested except the export function, which was not fully developed at the time the testing took place.

The app was tested by inputting information from pumps and motors at the Ogallala Nebraska and Arnold Nebraska wastewater treatment facilities. The assets were created, stored, and edited within the app. One issue with the app occurred if Ionic View was closed. The CUPSS app did

not stay loaded on Ionic View and stored information was cleared. This issue could likely be avoided if the CUPSS app could be loaded directly to the phone.

The app boasted a few key features and benefits that simplified the process of inputting data. First, the app is designed to work on mobile devices. This is beneficial because data can be entered while the user is next to the equipment, which eliminates the need to transfer information, as well as missing information. Second, the app provides a checklist of required information to the user, and prevents assets from being created until the required information is entered. Third, there is a minimal amount of typing required by the user. Most of the information is entered using dropdown menus, making data entry fast and easy.

Editing and storing assets in the app is user friendly. Once an asset is created it can be saved on the mobile device. More assets can be entered and saved as well. If an asset requires editing, the user simply selects the asset and makes the necessary changes. The asset will update with the new information. Once the assets are created, they can be exported and a schematic for the facility will be created and/or updated.

The main attribute of the app is the time saved for entry. Hansen used with both the desktop and mobile versions of CUPSS. For the inventory at the Ogallala facility, Hansen walked the process and wrote down all of the required information for CUPSS. All of the information was entered via desktop at a later time. The estimated time per unit of equipment was about 5 minutes. Using the app reduced this time to about 2.5 minutes, or about half the time. As mentioned earlier, using the app also prevented missing information when creating the asset. Missing information could add a significant amount of time to the process as it would require another visit to the piece of equipment.

To collect data, Hansen visited both the Ogallala and Arnold WWTFs. The process flow was followed starting at the influent station and the first piece of equipment the wastewater contacted. At Ogallala, the following pumps and motors were tested with the mobile app: influent pumps, grit unit blower, and primary clarifiers. A photo of the influent pump is shown in image 1, to the right. The data was written by hand in a journal for entry into the community's CUPSS profile. Pump information was collected from nameplates, manufacturer spec sheets.

It took approximately 3 hours to collect all of the information and input the data into the CUPSS schematic by hand and desktop. Entering the data using the mobile app took approximately the same time for entry in the desktop version. The time could potentially be cut in half by eliminating the need to write and transfer the data by hand, and also by reducing errors from missing information, which would require another visit to the machine.

Ultimately, the app worked and performed as expected. It was user-friendly, intuitive, and self-checking. The designers made the interface similar to the desktop version of CUPSS. The app will serve its users well.



*Image 2-An influent pump at the Ogallala WWTF.*