Flow Meter Scope

PROJECT UNDERSTANDING

Apex is considering a permanent flow monitor network maintained by an outside service provider. The network will consist of 14 flow monitors and 2 rain gauges. In general, the scope of services will include hardware installation, web-based data hosting, flow meter maintenance, and data confirmation and reporting.

PROJECT APPROACH

Monthly billing will begin after all meters have been installed and after our initial round of training. Our training will be focused on the web-based data delivery platform, Flowlink Cipher. We will review the basic data visualization tools and develop custom dashboards that illustrate meter function, uptime, voltage, flow balances, flow versus rainfall, and any other conceived output. Flowlink Cipher capabilities are discussed below.

Proposed Equipment and Data Hosting

We propose to use TeleDyne Isco Duratracker flow monitors provided by Clearwater, Inc. The monitors will be combined with submerged area velocity sensors. Rain gauges will consist of Duratracker loggers and Isco 674 tipping bucket rain gauges. Using all Duratracker equipment will allow all data reporting and storage on one web-based platform, Flowlink Cipher. All equipment will be brand new and utilize the most up-to-date modems.

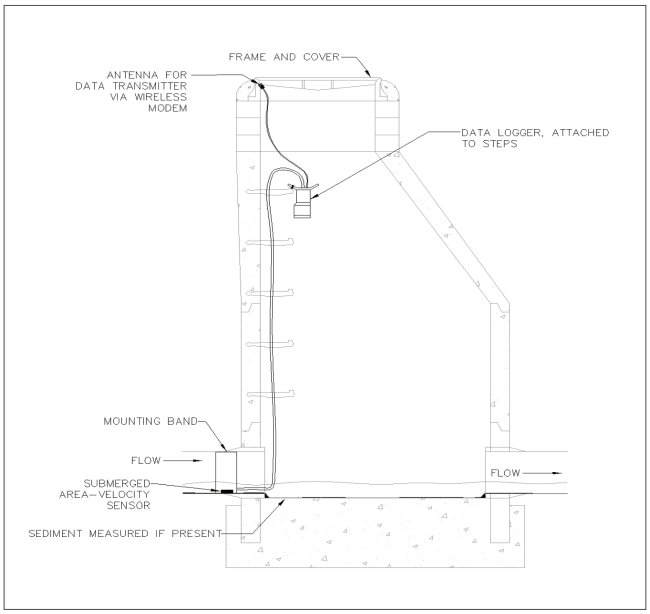
The Duratrackers can be programmed to sample flow every 1-minute but will be set to collect data every 15 minutes and call-in data every hour. Failure notifications will be programmed and set to distribute to Vision NC staff via SMS texts and emails when any problems occur with the meters. Additional level alarms, or any requested notifications can be programmed and sent to Apex staff as well.

Field Work

The success of this project starts with our team. Vision NC has experienced, local-based staff to

The Vision NC Difference:

- Our crews are confined space-certified for all installation and maintenance of flow monitoring equipment.
- All clients receive web-based data hosting to provide real-time data delivery and protected, shared access to the data for use across personnel and departments.
- Apex receives 24-hour data monitoring with alarm protocols to guarantee meter uptime and improve data quality.



STREAMLINING APEX'S WASTEWATER OPERATIONS WITH FLOWLINK CIPHER

Flowlink Cipher offers Apex a cutting-edge, cloud-based solution for efficient wastewater flow monitoring. This platform enhances data management by granting site managers the ability to easily access, manage, and analyze data across multiple sites from any device without installing any software. Key benefits include:

Centralized Data Access: Securely access site statuses and flow data on any device, anywhere, with a user-friendly interface.

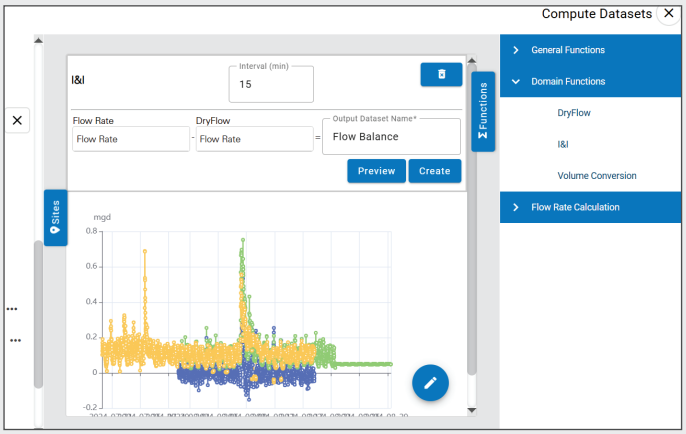
Enhanced Security and Reliability: Hosted on AWS for unparalleled protection against service interruptions or data loss.

Simplified Site Management: Effortlessly add sites, create graphs, and analyze data without expensive analysis or data manipulation.

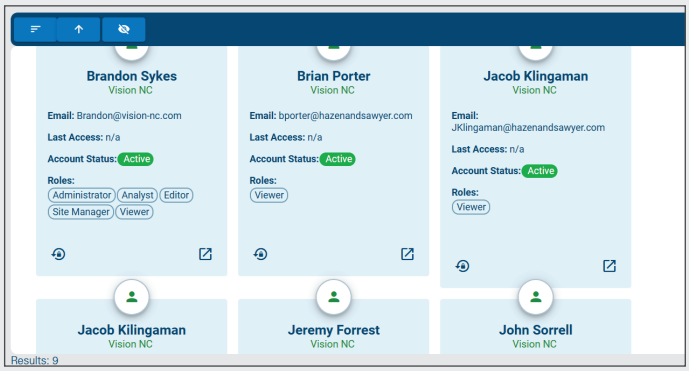
Interactive Map View: Quickly assess the status of each site with color-coded indicators and detailed site cards.

Cost Reductions: Eliminate local server maintenance, hardware costs, and free up IT resources, with automatic software updates.

Flowlink Cipher's functionality simplifies the monitoring process and provides comprehensive control and analytic capabilities, making it a substantial asset for the Apex's wastewater management efforts. Flowlink Cipher has the ability to interface with API and other software programs. This can be accomplished by a joint effort between the Town's IT programmers and Vinnie Bryant, with Clearwater Inc. who will provide additional technical support regarding equipment interface throughout the duration of the project. In addition to Clearwater, Inc., Teledye ISCO technical support team will be avialabe to assist and customize proper code modes to interface between Cipher and Town's API.

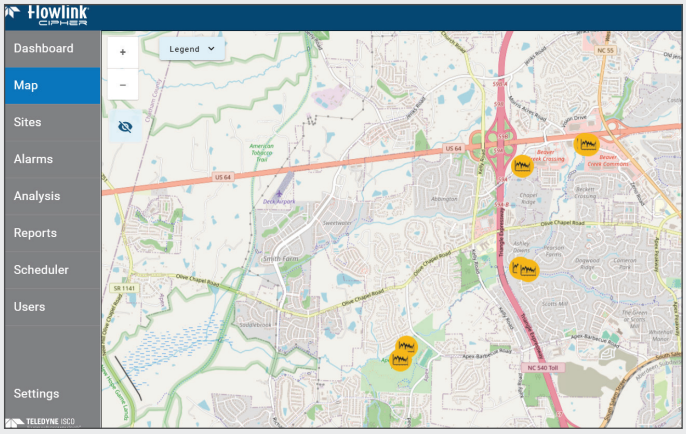


I/I calculations



Multiple users/permissions

Dashboard with customized widgets



Mapping with alarm status

support the project and to ensure that we achieve uptime requirements, and most importantly, that we capture and provide reliable data.

Installation: Field crews will install all new equipment in accordance with the manufacturer's recommendations and guidelines. All work will comply with all local and OSHA rules for confined space entry. We also understand that some of the meter sites are difficult to access, and our crews all have all-terrain vehicles that can be used to carry equipment and personnel to sites that are inaccessible to vehicles.

Meter sites will first be evaluated in the field to confirm suitable access and hydraulics. We expect that the existing sites are suitable since they are currently used to host permanent installations. However, a back-up site will be identified for any unsuitable meter locations. Alternate locations will be selected to maintain the intent of the original meter location. Our field crews will conduct a full site evaluation on each proposed meter site to evaluate its suitability and determine if there are any conditions that could adversely affect the quality of the data collected. Selected sites must be chosen with suitable hydraulic characteristics (sufficient depth and velocity, minimal turbulence, no drop connections, etc.) to ensure that the highest quality data can be obtained. A detailed Site Evaluation Report will be prepared for each potential site, including:

- Meter ID number
- Site address
- Mapping grade coordinates of meter locations
- Pipe diameter and manhole dimensions
- Manual depth and velocity measurements
- Photographs of the above-ground area around the manhole, the invert of the manhole, and sensor installations
- Vicinity map showing the location of the meter
- Documentation of previous surcharge and debris accumulation

Meter Maintenance: Once the meters are installed, it is vital that they be properly maintained to ensure that accurate data is obtained. Monthly site visits will be performed in order to ensure the sensors are clean and the meters are functioning as intended. Manual level and velocity measurements will be captured during the first two months of monitoring and compared to the meter recordings. Once the meters are "dialed in", manual measurements will be captured on a quarterly basis.

In addition to the required field trips to verify calibration and site conditions, the data will be under constant 24/7 monitoring. This is accomplished with user-set alarms that let us know when measurements are outside of the norm for a particular site. Alarm alerts are sent to our data technicians by both SMS text and email. If the data event is due to potential equipment or debris, a field crew is immediately dispatched to prevent data loss and ensure meter uptime requirements.

Our field service crews will have an inventory of replacement equipment, batteries, and other materials required for routine and emergency meter maintenance. This allows them to respond quickly to equipment failures and maintenance needs as they arise.

Data Management and Delivery

Our team will perform data management and review.. We will also remain flexible to assist outside consultants with data and access to data for hydraulic modeling. Our data technicians will monitor data daily, not only to ensure uptime but to also quickly identify level drifts or anomalies outside of the standard deviation of the diurnal that would indicate equipment malfunction. Data sets will be adjusted and reconstructed as needed. Final data can be pushed back to Flowlink Cipher for seamless integration with accurate data.

Deliverables

The raw data will be reviewed and analyzed by our data technicians and Project Manager. Analysis activities and deliverables include:

- Comparison of raw data to manual depth and velocity readings taken during calibration and maintenance visits.
- Review scatter plots of flow depth versus velocity and identify questionable data.
- Flow balancing of meters in series – comparison of the gross average daily flow rates to ensure that flow totals increase in successive meters.
- Data adjustment and reconstruction will be preformed as required. All data edits will be synced to Flowlink Cipher for seamless delivery and integration.

Vision NC believes a spreadsheet summary should be maintained in order to evaluate average daily flow balances, I/I ratios, and trending. This summary spreadsheet will be provided quarterly and include:

- Average Daily Flow (ADF)
- Average Daily Dry Weather Flow (ADWF)
- Average Total Inflow and Infiltration (Calculated per meter basin; I/I= ADF – ADWF)
- Peak 15-minute Flow and Depth

BACKED BY TELEDYNE ISCO

Your Vision NC project manager has worked with Teledyne ISCO for over 20 years..

All equipment will be purchased through Cleanwaer, Inc., our local Teledyne ISCO dealer. Vinnie Bryant will provide additional technical assistance on an on-call basis to ensure complete customer satisfaction. Vinnie is well known in our area providing wastewater solutions to many of the surrounding municipalities.

Water and wastewater treatment and operations are subjected to ever-increasing levels of regulation, public scrutiny, and pressures for more efficiency. ClearWater can assist with an array of quality instrumentation and control products to help Apex measure and manage critical parameters in your plants and systems. Their skilled team can help assure a trouble-free start-up.

Unmatched Customer Service

Teledyne ISCO's Technical Service can be reached M-F 8:00 am to 5:00 pm Central time, and we have their direct emails for additional access. The average experience of the team is a impressive 30 years with 40 years for one single member! This team can handle anything ranging from general application questions, installation questions, troubleshooting equipment, modem programing, data analysis, and software support. They have the ability to logon remotely while we are onsite and provide an addition level of troubleshooting support.