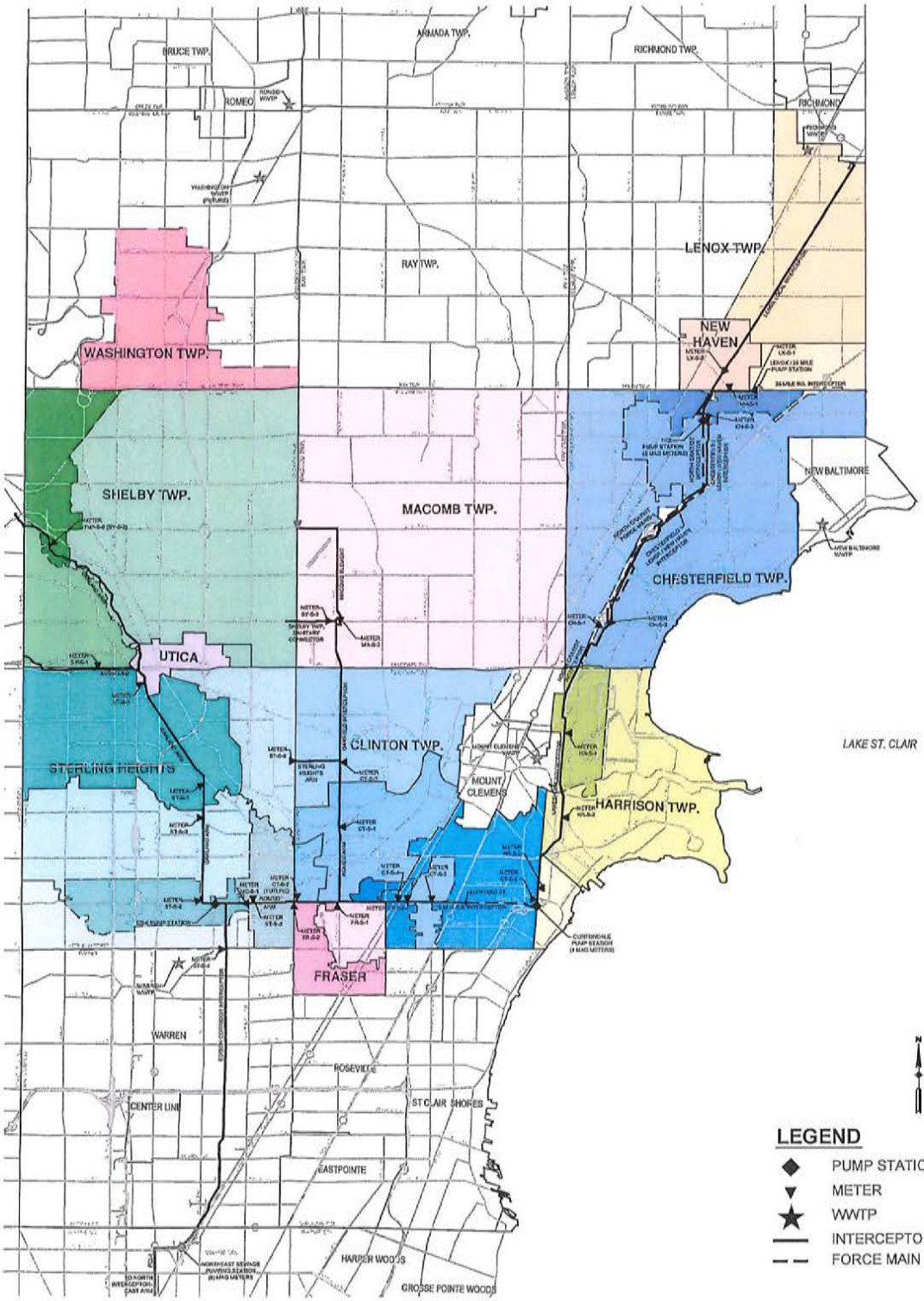
Miller
Santo
Mijac

MACOMB INTERCEPTOR DRAIN
INTRA-COUNTY DRAINAGE BOARD
MAY 13, 2019
10:30 A.M.
AGENDA

	Page
1. Call of meeting to order and roll call	
2. Approval of Agenda for May 13, 2019	
3. Approval of Minutes for April 8, 2019	3
4. Public Participation	
5. SCADA Standards and Communication Study – Vince Astorino	7
Motion: To approve the proposal from Tetra Tech for the Phase 1 SCADA Standards & Communication Study for a not-to-exceed amount of $98,500	
6. Biofilter Media Replacement – Vince Astorino	16
Motion: To approve the proposal from Cortis Bros. to remove and replace the media at the Biofilter for a not-to-exceed amount of $84,500	
7. Purchase of (4) MID Flow Meters – Vince Astorino	22
Motion: To approve the proposal from ADS for the purchase and installation of four Flow Meters and six month maintenance for a not-to-exceed amount of $46,200	
8. Consideration for approval of invoices (see attached)	34
9. Financial Report – Bruce Manning	36
10. Adjourn	

MACOMB INTERCEPTOR DRAIN DRAINAGE DISTRICT



MACOMB COUNTY MICHIGAN

Candice S. Miller

MACOMB COUNTY PUBLIC WORKS COMMISSIONER

fish

UPDATED: FEBRUARY 2017

An adjourned meeting of the Intra-County Drainage Board for the **MACOMB INTERCEPTOR DRAIN** was held in the Office of the Macomb County Public Works Commissioner, 21777 Dunham, Clinton Township, Michigan, on April 8, 2019, at 10:28 A.M.

PRESENT: Candice S. Miller, Chair

Bryan Santo, Member

Robert Mijac, Member

ALSO PRESENT: Brian Baker, Chief Deputy Commissioner, Karen Czernel, Deputy Government Relations, Vince Astorino, Operations & Flow Manager, Evans Bantios, Construction & Maintenance Manager, Dan Heaton, Communications Manager, Kellie Kource, Drain Account Specialist, Bruce Manning, Financial Manager, Tom Stockel, Construction Engineer, Kyle McKee, Community Services Manager, Macomb County Public Works; Joe Viviano, MIDD Attorney, Ben Aloia, MIDD Attorney, Chris Dilbert, New Haven, Mary Bednar, Clinton Township, Stephen Saph, Insurance Broker

The meeting was called to order by the Chair, Candice Miller. A motion was made by Mr. Mijac supported by Mr. Santo to approve the agenda as presented.

Adopted: YEAS: 3
NAYS: 0

Minutes of the meeting of March 11, 2019 were presented. A motion was made by Mr. Mijac, supported by Mr. Santo to approve the minutes as presented.

Adopted: YEAS: 3
NAYS: 0

The meeting was opened to public participation, then closed, there being no comments from the public.

Stephen Saph updated the board that there was a minor 1.8% increase in liability insurance renewal costs from last year. Last year we went through an exhaustive process to blanket the marketplace, present the proposal and secure liability coverage for the drainage districts. This year was a two part process working with the expiring carrier who came back with a minor increase. They are confident that what they brought to us is a duplicate of what was established last year from a coverage standpoint. We are protected for general liability, if we are sued over bodily injury or property damage. As public officials, wrongful act is covered if as board members decision is made or not made and someone brings legal action. Defense expenses are covered, they hire an attorney to come defend and investigate a matter. The underground quote was $12,000, however is not in this agreement. That policy renews July 1. This main policy renews April 26. The appraisal company will be out again in May or June to do another installment for the County. Stephen will touch base with Evans and Vince if there is anything major they need. Mr. Santo asked if there was a deductible. Stephen stated that there is a $250,000 retention. He explained the difference between a deductible and retention.

A motion was made by Mr. Santo, supported by Mr. Haugh to approve the general liability insurance coverage renewal with Argonaut Insurance Company in the amount of $185,706 (MIDD share $181,992).

Adopted: YEAS: 3
NAYS: 0

Mr. Astorino updated the board on the Aquasight Data Review Software Proposal stating that the MIDD manages 30 customer connection points. To manage that and all the data that comes in we currently have a data review platform that was developed in 2009 called MARS that is old desktop based program. In 2015 we contracted with Ghadys to develop a web based platform. Four years later they have not progressed past completion of the first phase and there is no light at the end of the tunnel. Aquasight works with many communities around us and have a great track record. They have artificial intelligence built in, weather modeling, everything that we could need. We propose that we terminate the contract with Bluewater due to the long term expenses to get the program where it needs to be. Aquasight is telling Mr. Astorino that it should not take more than 6 months to develop this data review tool. We are asking for $290,000 to do Model 1/Wave 1 which is strictly the data review tool. Wave 2 would be the next step of rolling it out to the community and giving everyone access to it. If we like the program, Module 2, 3 and 4 would roll into next steps of bringing in all of our pump stations and CSO facilities. Aquasight has real time control features and prediction models built into the program to help predict before an event how much chlorine we would use. This would be re-allocating money from Bluewater to Aquasight. There is around $50,000 left on the contract would be rolled into this. Mr. Mijac asked how such a bad choice was made and it was noted that this is still clean up from old decisions that did not go to the MIDD board.

A motion was made by Mr. Mijac, supported by Mr. Santo to approve the proposal from Aquasight in the amount of $290,000 for the development of Module 1 – Wave 1 and to terminate the contract with Ghadys for the development of the Bluewater program.

Adopted: YEAS: 3
NAYS: 0

Mr. Baker updated the board that the GLWA approved their budget as well as OMID. We were able to achieve some savings from GLWA that has allowed us to free up money to help do the OMID improvements to the Northeast Pump Station and North Interceptor East Arm. The budget is only going up 2.5%, passing on the lowest rate increase to the MIDD communities in 9 years. The average increase from 2010-2016 was 15% per year. We have some costs coming off, but also have $6.0 million allocated for several new projects including $3.9 million for Segment 5 downstream of the interceptor collapse, $1.0 million for future rehab of 15 mile interceptor east of Garfield, and $1.0 million to inspect the MIDD system on a regular basis. The budget and charges detail has been sent out to the communities.

A motion was made by Mr. Mijac, supported by Mr. Santo to approve the 2019/2020 Macomb Interceptor Drainage District budget and charges.

Adopted: YEAS: 3
NAYS: 0

The Chair presented the invoices totaling $13,819,750.99 to the board for review and approval.

A motion was made by Mr. Mijac, supported by Mr. Santo to approve the invoices as presented.

Adopted: YEAS: 3
NAYS: 0

A motion to receive and file the financial report given by Mr. Manning was made by Mr. Mijac and supported by Mr. Santo.

Adopted: YEAS: 3
NAYS: 0

Commissioner Miller and Ben Aloia updated the board on the property at the northwest corner of M-59 and Garfield. A bid was accepted and they had 120 days to do due diligence and they decided to decline pursuing purchasing the property. There is a strip of land between the MIDD parcel property and Guastellos piece off of M-59 that is 60 foot wide and titled in Roads' name. It appears to be in error by the assessor and the County when creating a tax ID for the parcel and it was put under the Road Commission. In 1974 there was a correction with the County to correct it back to the original owner, and then it got changed back. Guastello got titled to his parcel, but never got that 60 feet. If it is corrected and the tax ID is lifted and Roads don't have any jurisdiction this land will go to the underlying land owner, which is the Kukuks. The potential purchaser was informed to file a title action, but did not ask to extend due diligence to resolve the issue. We will ask him if he wants an extension to resolve the issue. This is an issue that needs to get resolved in order to maximize our value. The board will agree to extend the due diligence if the buyer is still interested. If he declines we will re-advertise. We will also see if Kukuks would be willing to sell their interest in that piece to us then we can control it.

A motion was made by Mr. Santo, supported by Mr. Mijac to extend the due diligence another 120 days.

Adopted: YEAS: 3
NAYS: 0

A motion was made by Ms. Miller, supported by Mr. Santo, to enter into closed session at 11:08 a.m.

Adopted: YEAS: 3
NAYS: 0

Ms. Miller ended closed session and return the board to open session at 11:46 a.m.

Adopted: YEAS: 3
NAYS: 0

Ms. Miller entertained a motion to proceed as discussed in closed session, it was moved by Mr. Santo, supported by Mr. Mijac.

Adopted: YEAS: 3
NAYS: 0

There being no further business, it was moved by Mr. Santo, supported by Mr. Mijac, that the meeting of the Macomb Interceptor Drain Board be adjourned.

Adopted: YEAS: 3
NAYS: 0

The meeting was adjourned at 11:48 a.m.

Candice S. Miller, Chair
Macomb County Public Works Commissioner

STATE OF MICHIGAN
COUNTY OF MACOMB

I certify that the foregoing is a true and correct copy of proceedings taking by the Intra-County Drainage Board for the Drainage District shown on the attached set of minutes, on April 8, 2019 the original of which is on file in the Public Works Commissioner's Office. Public notice of the meeting was given pursuant to Act No. 267, Public Acts of Michigan, 1975, including, in the case of a special or rescheduled meeting or a meeting secured for more than 36 hours, notice by posting at least 18 hours prior to the time set for the meeting.

Candice S. Miller, Chair
Macomb County Public Works Commissioner

DATED: 4/8/19

Candice S. Miller
Public Works Commissioner
Macomb County

To: Candice Miller, Macomb County Public Works Commissioner

CC: Brian Baker, Chief Deputy

From: Vincent Astorino, Operations & Flow Manager

Date: April 26, 2019

Subject: Tetra Tech SCADA Standards and Communication Study Recommendation Letter

The Macomb County Public Works Office (MCPWO) manages a sophisticated Supervisory Control & Data Acquisition (SCADA) network. This SCADA system monitors/controls all of our pumps, gates, billing flow meters, retention basins, etc. The SCADA network has three primary components: a data center, a communication network, and software. All three components are critical to each other to preserve the highest uptime guarantee possible. If any system is to fail, it will put our 17,872 data points that operators are monitoring and controlling across the county at risk of catastrophic failure which could lead to public health risks.

The MCPWO SCADA system that was initially developed as part of the Lake St. Clair Clean Water Initiative project in SE Macomb has been pieced together over time as new drainage districts came online. System tags for each piece brought in were done with a conventional standard and instead every system is different which causes increase time with troubleshooting and changes. Also the software platform has not been updated since 2010 and the latest version available is Wonderware 2017. While the system has been very reliable, there is always room for improvement to ensure that it will operate at the highest level possible.

What I am proposing today, is to take a hard look at the MCPWO SCADA system through a multi-phase effort to address the following three top priorities:

1. SCADA System Updates
2. SCADA Standards Developments
3. Communications Network Improvements

When looking out in the field to whom would be best to handle a task such as this, there is only one company that would be able to give us what we need and that is Tetra Tech. They are the nation's preeminent consultant in SCADA for water and wastewater utilities. Some large utilities that they represent are Huntsville, AL; Collier County (Naples), FL; Dayton, OH; Lansing, Ann Arbor, Kalamazoo, Warren, Wayne County, Oakland County, Saginaw, Port Huron and many others. In total over 2 million Michigan residents are provided water and/or wastewater service with instrumentation and control systems designed by Tetra Tech. For this project, Tetra Tech has also

brought in Bob George for cybersecurity analysis and design. Bob is one of the authors of the AWWA Cybersecurity Design Manual which is essentially the bible for network security for water utilities. With MCPWO assets being potential soft targets for Terrorist threats, having Bob as part of the team to analyze the system will provide us with the comfort that the MCPWO is fully secure. This project will be split into four phases with only the first phase being awarded as part of this recommendation. Those phases are as follows:

1. SCADA and Communication Study (Current)
    a. This phase of work will consist of a full analysis of the current system platform. Tetra tech will also be sharing with MCPWO standards that have been developed by them for other communities. The scope of work for phase 2 will be developed as part of this to implement the changes identified by Tetra Tech to improve the MCPWO system
2. SCADA System Upgrades (Possible Future)
    a. This phase will implement the standards recommended by Tetra Tech for the MCPWO system.
3. SCADA Network Upgrades (Possible Future)
    a. This phase will implement recommendations provided by Tetra Tech to the MCPWO communication network.
4. Design and Implement Hosted Virtual SCADA Environment for all Macomb County Communities (Possible Future)
    a. We have been discussing with the Macomb County communities to bring their SCADA platforms into ours to provide them with a cost savings and a reliable SCADA network. It is very expensive for communities to build out a system like we have, and we have the ability to bring on new users. By going through this process, we will be able to have a standardized process and will be able to make this a smooth cost-effective transition.

With the additional 3 phases, we are hoping to handle the majority of that work in-house depending on what is found from the Phase 1 evaluation.

My recommendation is to move forward with Phase 1 of this plan to Tetra Tech in the not-to-exceed amount of $98,500. This has a $100,000 budget within the MIDDD 19/20 budget.

Attachments: Tetra Tech Proposal 2-18-19

TETRA TECH

February 18, 2019
Transmitted Electronically

Mr. Vincent Astorino
Operations and Flow Manager
Macomb County Public Works
21777 Dunham Road
Clinton Township, MI 48036

Re: SCADA Standards Development and Communications Study

Dear Mr. Astorino:

Thank you for the opportunity to meet on January 15, 2019, to discuss the county's vision for the SCADA system. During our conversation on January 15th, you identified 3 priorities for the Macomb County SCADA system:

1. SCADA system updates
2. SCADA standards development
3. Communications network improvements

You also described your plans to host and provide SCADA server infrastructure to small communities in your area using on-premises virtual server infrastructure. Tetra Tech is pleased to provide Macomb County this proposal for a phased project approach to accomplish these ambitious goals.

We propose addressing the county's needs in a phased approach. The first phase allows Tetra Tech and the county to address immediate needs while we further understand the vision for later phases. At the completion of Phase I we will better be positioned to refine the scope and fee for subsequent phases.

Our vision for the project follows:

Phase 1: SCADA and Communications Study

Conduct on-site assessment of systems and supporting infrastructure to develop an accurate and fundamental understanding of SCADA and Communication Networks architecture. Examine current operations and identify opportunities to support multiple customer SCADA systems on County server infrastructure.

1. SCADA Assessment: Develop the functional requirements supporting standards development for:
   a. Human Machine Interface (HMI) software standards
      i. HMI software options
      ii. Programming standards
      iii. Cloud options
   b. Equipment standards

Tetra Tech
710 Avis Drive, Ann Arbor, MI 48108
Tel (734) 665-6000 www.tetratech.com

c. Alarm Philosophy
d. HMI standards
e. PLC standards
   i. Hardware standards
   ii. Programming standards
f. Cybersecurity standards
   i. Use cases
   ii. SCADA asset criticality classification
g. Virtualization

Within this phase we envision sharing with Macomb County programming standards Tetra Tech has developed for other communities to aid in the identification of features to be selected for implementation within Macomb County's system.

2. SCADA Communications Study: A reliable, performant and secure network infrastructure is necessary to support critical SCADA communications. Tetra Tech will evaluate the County's existing network equipment, infrastructure and services to identify opportunities to improve performance, security and reliability.

Assessment will include:

a. Existing licensed radio infrastructure
b. Existing cellular services
c. Existing cable services
d. Potential licensed and unlicensed radio opportunities
e. Potential communications service alternatives
f. Network addressing and routing
g. Cybersecurity zones and conduits (per ISA-99/IEC 62443).

Phase 1: Develop Scope of Work for Phase 2 Implementation

The second goal for this phase is to develop the necessary Scope of Work and Level of Effort required for the County to upgrade the County SCADA system, supporting communications network infrastructure, and virtualized server infrastructure to support hosting customer systems. Our focus will be to establish a vision for the Utility, establish functional requirements for the SCADA system, review available features supported by the SCADA marketplace, identify areas for examination and improvement in SCADA administration, categorize tasks, and provide Level of Effort estimates to complete these efforts in the following tasks.

Phase 2: SCADA System Upgrades

Standards are essential both to Macomb County directly for efficient operation of the County SCADA system, and to provide interoperable standards to support the hosting of multiple customer SCADA systems on County server infrastructure.

1. SCADA Standards Development: Standards will be identified and developed for:
   a. Software

b. Equipment
c. Alarm Philosophy
d. HMI standards
e. PLC standards
f. Cybersecurity
g. Disaster Recovery

Phase 3: SCADA Network Upgrades

Based on the standards developed in the preceding phase, Tetra Tech will work with the County to improve and expand communications capabilities.

1. Current network condition assessment.
2. Identify network requirements.
3. Identify alternatives.
4. Develop implementation plan.

Phase 4: Design and implement hosted virtual SCADA environment

Based on the standards developed in the preceding phase, Tetra Tech will work with the County to develop and implement hosted server infrastructure.

1. Identify hosting requirements.
2. Identify hosting alternatives.
3. Develop hosting implementation plan.

ASSUMPTIONS

- SCADA System Stakeholders will be available for interviews and workshop.
- Macomb County Enterprise Cyber Security lead will be available for interview.
- Utility will provide existing SCADA and Network Documentation.

COMPENSATION

Compensation will be based on our standard hourly rates. We suggest a budget of $98,500 be established for Phase I services.

SCHEDULE

We suggest a schedule of 16 weeks to complete Phase I. This schedule may vary depending on interim findings and modifications to the approach that may be needed and mutually agreed to.

NEXT STEPS

Please review this approach with your team to verify our project understanding is aligned with your concepts for this work. We understand that the county will prepare a professional services contract to cover the work outlined within.

TETRA TECH

We look forward to your feedback for this important project. If you need additional information, please call Mick Jones at (734) 213-5075.

Sincerely,

Mick S. Jones

Mick S. Jones, P.E.
Senior Project Manager

Brian M. Rubel

Brian M. Rubel, P.E.
Vice President

Encl.: Standard Terms and Conditions

PROPOSAL ACCEPTED BY_____

TITLE_____ **DATE**_____

Macomb County SCADA Standards Development and Communications Study

Tetra Tech, Inc.
Engineering Services Standard Terms & Conditions

Services Consultant will perform services for the Project as set forth in the provisions for Scope of Work/Fee/Schedule in the proposal and in accordance with these Terms & Conditions. Consultant has developed the Project scope of service, schedule, and compensation based on available information and various assumptions. The Client acknowledges that adjustments to the schedule and compensation may be necessary based on the actual circumstances encountered by Consultant in performing their services. Consultant is authorized to proceed with services upon receipt of an executed Agreement.

Compensation In consideration of the services performed by Consultant, the Client shall pay Consultant in the manner set forth above. The parties acknowledge that terms of compensation are based on an orderly and continuous progress of the Project. Compensation shall be equitably adjusted for delays or extensions of time beyond the control of Consultant. Where total project compensation has been separately identified for various tasks, Consultant may adjust the amounts allocated between tasks as the work progresses so long as the total compensation amount for the project is not exceeded.

Fee Definitions The following fee types shall apply to methods of payment:

- **Salary Cost** is defined as the individual's base salary plus customary and statutory benefits. Statutory benefits shall be as prescribed by law and customary benefits shall be as established by Consultant employment policy.
- **Cost Plus** is defined as the individual's base salary plus actual overhead plus professional fee. Overhead shall include customary and statutory benefits, administrative expense, and non-project operating costs.
- **Lump Sum** is defined as a fixed price amount for the scope of services described.
- **Standard Rates** is defined as individual time multiplied by standard billing rates for that individual.
- **Subcontracted Services** are defined as Project-related services provided by other parties to Consultant.
- **Reimbursable Expenses** are defined as actual expenses incurred in connection with the Project.

Payment Terms Consultant shall submit invoices at least once per month for services performed and Client shall pay the full invoice amount within 30 days of the invoice date. Invoices will be considered correct if not questioned in writing within 10 days of the invoice date. Client payment to Consultant is not contingent on arrangement of project financing or receipt of funds from a third party. In the event the Client disputes the invoice or any portion thereof, the undisputed portion shall be paid to Consultant based on terms of this Agreement. Invoices not in dispute and unpaid after 30 days shall accrue interest at the rate of one and one-half percent per month (or the maximum percentage allowed by law, whichever is the lesser). Invoice payment delayed beyond 60 days shall give Consultant the right to stop work until payments are current. Non-payment beyond 70 days shall be just cause for termination by Consultant.

Additional Services The Client and Consultant acknowledge that additional services may be necessary for the Project to address issues that may not be known at Project initiation or that may be required to address circumstances that were not foreseen. In that event, Consultant shall notify the Client of the need for additional services and the Client shall pay for such additional services in an amount and manner as the parties may subsequently agree.

Site Access The Client shall obtain all necessary approvals for Consultant to access the Project site(s).

Underground Facilities Consultant and/or its authorized subcontractor will conduct research and perform site reconnaissance in an effort to discover the location of existing underground facilities prior to developing boring plans, conducting borings, or undertaking invasive subsurface investigations. Client recognizes that accurate drawings or knowledge of the location of such facilities may not exist, or that research may reveal as-built drawings or other documents that may inaccurately show, or not show, the location of existing underground facilities. In such events, except for the sole negligence, willful misconduct, or practice not conforming to the Standard of Care cited in this Agreement, Client agrees to indemnify and hold Consultant and/or its Subcontractor harmless from any and all property damage, injury, or economic loss arising or allegedly arising from borings or other subsurface penetrations.

Regulated Wastes Client is responsible for the disposal of all regulated wastes generated as a result of services provided under this Agreement. Consultant and Client mutually agree that Consultant assumes no responsibility for the waste or disposal thereof.

Contractor Selection Consultant may make recommendations concerning award of construction contracts and products. The Client acknowledges that the final selection of construction contractors and products is the Client's sole responsibility.

Ownership of Documents Drawings, specifications, reports, programs, manuals, or other documents, including all documents on electronic media, prepared under this Agreement are instruments of service and are, and shall remain, the property of Consultant. Record documents of service shall be based on the printed copy. Consultant will retain all common law, statutory, and other reserved rights, including the copyright thereto. Consultant will furnish documents electronically; however, the Client releases Consultant from any liability that may result from documents used in this form. Consultant shall not be held liable for reuse of documents or modifications thereof by the Client or its representatives for any purpose other than the original intent of this Agreement, without written authorization of and appropriate compensation to Consultant.

Standard of Care Services provided by Consultant under this Agreement will be performed in a manner consistent with that degree of care and skill ordinarily exercised by members of the same profession currently practicing under similar circumstances. Consultant makes no warranty or guaranty, either express or implied. Consultant will not be liable for the cost of any omission that adds value to the Project.

Period of Service This Agreement shall remain in force until completion and acceptance of the services or until terminated by mutual agreement. Consultant shall perform the services for the Project in a timely manner consistent with sound professional practice. Consultant will strive to perform its services according to the Project schedule set forth in the provisions for Scope of Work/Fee/Schedule above. The services of each task shall be considered complete when deliverables for the task have been presented to the Client. Consultant shall be entitled to an extension of time and compensation adjustment for any delay beyond Consultant control.

Insurance and Liability Consultant shall maintain the following insurance and coverage limits during the period of service. The Client will be named as an additional insured on the Commercial General Liability and Automobile Liability insurance policies.

Worker's Compensation – as required by applicable state statute
Commercial General Liability - $1,000,000 per occurrence for bodily injury, including death and property damage, and $2,000,000 in the aggregate
Automobile Liability –$1,000,000 combined single limit for bodily injury and property damage
Professional Liability (E&O) - $1,000,000 each claim and in the aggregate

The Client shall make arrangements for Builder's Risk, Protective Liability, Pollution Prevention, and other specific insurance coverage warranted for the Project in amounts appropriate to the Project value and risks. Consultant shall be a named insured on those policies where Consultant may be at risk. The Client shall obtain the counsel of others in setting insurance limits for construction contracts.

Indemnification Consultant shall indemnify and hold harmless the Client and its employees from any liability, settlements, loss, or costs (including reasonable attorneys' fees and costs of defense) to the extent caused solely by the negligent act, error, or omission of Consultant in the performance of services under this Agreement. If such damage results in part by the negligence of another party, Consultant shall be liable only to the extent of Consultant's proportional negligence.

Dispute Resolution The Client and Consultant agree that they shall diligently pursue resolution of all disagreements within 45 days of either party's written notice using a mutually acceptable form of mediated dispute resolution prior to exercising their rights under law. Consultant shall continue to perform services for the Project and the Client shall pay for such services during the dispute resolution process unless the Client issues a written notice to suspend work. Causes of action between the parties to this Agreement shall be deemed to have accrued and the applicable statutes of repose and/or limitation shall commence not later than the date of substantial completion.

Suspension of Work The Client may suspend services performed by Consultant with cause upon fourteen (14) days written notice. Consultant shall submit an invoice for services performed up to the effective date of the work suspension and the Client shall pay Consultant all outstanding invoices within fourteen (14) days. If the work suspension exceeds thirty (30) days from the effective work suspension date, Consultant shall be entitled to renegotiate the Project schedule and the compensation terms for the Project.

Termination The Client or Consultant may terminate services on the Project upon seven (7) days written notice without cause or in the event of substantial failure by the other party to fulfill its obligations of the terms hereunder. Consultant shall submit an invoice for services performed up to the effective date of termination and the Client shall pay Consultant all outstanding invoices, together with all costs arising out of such termination, within fourteen (14) days. The Client may withhold an amount for services that may be in

dispute provided that the Client furnishes a written notice of the basis for their dispute and that the amount withheld represents a reasonable value.

Authorized Representative The Project Manager assigned to the Project by Consultant is authorized to make decisions or commitments related to the project on behalf of Consultant. Only authorized representatives of Consultant are authorized to execute contracts and/or work orders on behalf of Consultant. The Client shall designate a representative with similar authority. Email messages between Client and members of the project team shall not be construed as an actual or proposed contractual amendment of the services, compensation or payment terms of the Agreement.

Project Requirements The Client shall confirm the objectives, requirements, constraints, and criteria for the Project at its inception. If the Client has established design standards, they shall be furnished to Consultant at Project inception. Consultant will review the Client design standards and may recommend alternate standards considering the standard of care provision.

Independent Consultant Consultant is and shall be at all times during the term of this Agreement an independent consultant and not an employee or agent of the Client. Consultant shall retain control over the means and methods used in performing Consultant's services and may retain subconsultants to perform certain services as determined by Consultant.

Compliance with Laws Consultant shall perform its services consistent with sound professional practice and endeavor to incorporate applicable laws, regulations, codes, and standards applicable at the time the work is performed. In the event that standards of practice change during the Project, Consultant shall be entitled to additional compensation where additional services are needed to conform to the standard of practice.

Permits and Approvals Consultant will assist the Client in preparing applications and supporting documents for the Client to secure permits and approvals from agencies having jurisdiction over the Project. The Client agrees to pay all application and review fees.

Limitation of Liability In recognition of the relative risks and benefits of the project to both the Client and Consultant, the risks have been allocated such that the Client agrees, to the fullest extent permitted by law, to limit the liability of Consultant and its subconsultants to the Client and to all construction contractors and subcontractors on the project for any and all claims, losses, costs, damages of any nature whatsoever or claims expenses from any cause or causes, so that the total aggregate liability of Consultant and its subconsultants to all those named shall not exceed $50,000 or the amount of Consultant's total fee paid by the Client for services under this Agreement, whichever is the greater. Such claims and causes include, but are not limited to negligence, professional errors or omissions, strict liability, breach of contract or warranty.

Consequential Damages Notwithstanding any other provision of this Agreement, and to the fullest extent permitted by law, neither the Client nor Consultant, their respective officers, directors, partners, employees, contractors or subconsultants shall be liable to the other or shall make any claim for any incidental, indirect or consequential damages arising out of or connected in any way to the project or to this Agreement. This mutual waiver of consequential damages shall include, but is not limited to, loss of use, loss of profit, loss of business, loss of income, loss of reputation or any other consequential damages that either party may have incurred from any cause of action including negligence, strict liability, breach of contract and breach of strict or implied warranty. Both the Client and Consultant shall require similar waivers of consequential damages protecting all the entities or persons named herein in all contracts and subcontracts with others involved in this project or with this Agreement.

Waiver of Subrogation Consultant shall endeavor to obtain a waiver of subrogation against the Client, if requested in writing by the Client, provided that Consultant will not increase its exposure to risk and Client will pay the cost associated with any premium increase or special fees.

Environmental Matters The Client warrants that they have disclosed all potential hazardous materials that may be encountered on the Project. In the event unknown hazardous materials are encountered, Consultant shall be entitled to additional compensation for appropriate actions to protect the health and safety of its personnel, and for additional services required to comply with applicable laws. The Client shall indemnify Consultant from any claim related to hazardous materials encountered on the Project except for those events caused by negligent acts of Consultant.

Cost Opinions Consultant shall prepare cost opinions for the Project based on historical information that represents the judgment of a qualified professional. The Client and Consultant acknowledge that actual costs may vary from the cost opinions prepared and that Consultant offers no guarantee related to the Project cost.

Contingency Fund The Client acknowledges the potential for changes in the work during construction and the Client agrees to include a contingency fund in the Project budget appropriate to the potential risks and uncertainties associated with the Project. Consultant may offer advice concerning the value of the contingency fund; however, Consultant shall not be liable for additional costs that the Client may incur beyond the contingency fund they select unless such additional cost results from a negligent act, error, or omission related to services performed by Consultant.

Safety Consultant shall be responsible solely for the safety precautions or programs of its employees and no other party.

Information from Other Parties The Client and Consultant acknowledge that Consultant will rely on information furnished by other parties in performing its services under the Project. Consultant shall not be liable for any damages that may be incurred by the Client in the use of third party information.

Force Majeure Consultant shall not be liable for any damages caused by any delay that is beyond Consultant's reasonable control, including but not limited to unavoidable delays that may result from any acts of God, strikes, lockouts, wars, acts of terrorism, riots, acts of governmental authorities, extraordinary weather conditions or other natural catastrophes, or any other cause beyond the reasonable control or contemplation of either party.

Waiver of Rights The failure of either party to enforce any provision of these terms and conditions shall not constitute a waiver of such provision nor diminish the right of either party to the remedies of such provision.

Warranty Consultant warrants that it will deliver services under the Agreement within the standard of care. No other expressed or implied warranty is provided by Consultant.

Severability Any provision of these terms later held to be unenforceable shall be deemed void and all remaining provisions shall continue in full force and effect. In such event, the Client and Consultant will work in good faith to replace an invalid provision with one that is valid with as close to the original meaning as possible.

Survival All obligations arising prior to the termination of this Agreement and all provisions of these terms that allocate responsibility or liability between the Client and Consultant shall survive the completion or termination of services for the Project.

Assignments Neither party shall assign its rights, interests, or obligations under the Agreement without the express written consent of the other party.

Governing Law The terms of Agreement shall be governed by the laws of the state where the services are performed provided that nothing contained herein shall be interpreted in such a manner as to render it unenforceable under the laws of the state in which the Project resides.

Collection Costs In the event that legal action is necessary to enforce the payment provisions of this Agreement if Client fails to make payment within sixty (60) days of the invoice date, Consultant shall be entitled to collect from the Client any judgment or settlement sums due, reasonable attorneys' fees, court costs, and expenses incurred by Consultant in connection therewith and, in addition, the reasonable value of Consultant's time and expenses spent in connection with such collection action, computed at Consultant's prevailing fee schedule and expense policies.

Equal Employment Opportunity Consultant will comply with federal regulations pertaining to Equal Employment Opportunity. Consultant is in compliance with applicable local, state, and federal regulations concerning minority hiring. It is Consultant's policy to ensure that applicants and employees are treated equally without regard to race, creed, sex, color, religion, veteran status, ancestry, citizenship status, national origin, marital status, sexual orientation, or disability. Consultant expressly assures all employees, applicants for employment, and the community of its continuous commitment to equal opportunity and fair employment practices.

Attorney Fees Should there be any suit or action instituted to enforce any right granted in this contract, the substantially prevailing party shall be entitled to recover its costs, disbursements, and reasonable attorney fees from the other party. The party that is awarded a net recovery against the other party shall be deemed the substantially prevailing party unless such other party has previously made a bona fide offer of payment in settlement and the amount of recovery is the same or less than the amount offered in settlement. Reasonable attorney fees may be recovered regardless of the forum in which the dispute is heard, including an appeal.

Third Party Beneficiaries Nothing in this Agreement shall create a contractual relationship with or a cause of action in favor of a third party against either the Client or the Consultant. The Consultant's services under this Agreement are being performed solely for the Client's benefit, and no other entity shall have any claim against the Consultant because of this Agreement or the performance or nonperformance of services hereunder. The Client agrees to include a provision in all contracts with contractors and other entities involved in this project to carry out the intent of this paragraph.

Lien Rights Consultant may file a lien against the Client's property in the event that the Client does not make payment within the time prescribed in this Agreement. The Client agrees that services by Consultant are considered property improvements and the Client waives the right to any legal defense to the contrary.

Captions The captions herein are for convenience only and are not to be construed as part of this Agreement, nor shall the same be construed as defining or limiting in any way the scope or intent of the provisions hereof.

Vincent Astorino <vincent.astorino@macombgov.org>

SCADA SUMMARY

Jones, Mick <Mick.Jones@tetratech.com> Fri, Apr 26, 2019 at 2:08 PM
To: Vincent Astorino <vincent.astorino@macombgov.org>
Cc: "Rubel, Brian" <Brian.Rubel@tetratech.com>

Vince,

The development of our SCADA study proposal was based on mostly senior engineering staff including our cybersecurity expert (national practice leader) and network design lead expert (certified Cisco engineer).

Below is a summary billing rate table used to develop our proposal.

Billing Title	Billing Rate/Hr.
Sr Project Manager	$235
Sr Sys Analyst / Programmer 2	$215
Sr Engineer 2	$210
Sr Engineer 3	$220
Cybersecurity Lead	$275
Network Design Lead	$270
CAD Designer	$110

Mick Jones, P.E. | Senior Project Manager

Direct:734.213.5075 | Cell: 734.417.4430

mick.jones@tetratech.com

Tetra Tech | Complex World, Clear Solutions™ | United States Infrastructure

710 Avis Drive | Ann Arbor, MI 48108 | www.tetratech.com

Please consider the environment before printing.

Candice S. Miller
Public Works Commissioner
Macomb County

To: Candice Miller, Macomb County Public Works Commissioner

CC: Brian Baker, Chief Deputy

From: Vincent Astorino, Operations & Flow Manager

Date: May 7, 2019

Subject: Biofilter Media Replacement Recommendation

The Biofilter Facility located on 15 Mile near Garfield is an odor and corrosion control facility that is used to pull air from the interceptor through three large media beds which treat the air and then release it to atmosphere. This is done with a large blower which is creating suction in the sewer side and then a series of conduits which trickle the airflow through the beds. This media that is in those beds has a useful life of 3-5 years before it is required to replace it. This facility is now in year four and we have noticed significant degradation of the media which is causing the facility to not operate properly.

We went out looking for pricing from several contractors to remove and replace the media. The three contractors were Cortis Bros. Trucking and Excavating (Cortis Bros.), R.G. Eisenhardt Contracting (Eisenhardt), and Doetsch Environmental Services (Doetsch).

Eisenhardt and Cortis Bros. were within $1,750 of one another. Cortis Bros. came in at $84,500 and Eisenhardt was at $86,250. Doetsch only provided pricing for removal as we were looking for other types of options for getting rid of the material and they were at $76,800 just to take the material off the beds. This does not include disposal or installing new material so they will be the highest cost if all of that is included.

All three contractors are qualified for this work and would be able to accomplish the task. I recommend moving forward with the Cortis Bros. proposal in the total not-to-exceed amount of **$84,500** as it is the lowest amount. We have $250,000 budgeted for this task and this will put us well under budget. The remaining funds can be put into the life-cycle funds to handle the next replacement.

Attachments: Doetsch Quote – 4/20/19
R.G. Eisenhardt Quote – 5/4/19
Cortis Bros. Quote – 4/17/19

CORTIS BROS.

TRUCKING & EXCAVATING, INC.

Proposal

Vendor			
Name	Macomb County Public Works		
Address	21777 Dunham Road		
City	Clinton Township	State MI	ZIP 48036
Phone	586-469-5325		

Misc.	
Date	4/17/2019
Rev date:	
Contact	Tom Stockel
Ticket No.	
Ticket Date:	

Job: ***Remove and replace biofilter media at 16510 15 Mile Road***

Qty	Description	Unit Price	TOTAL
	Cortis Brothers proposes to: 1. Remove 1000 cyds of existing biofilter media and haul to landfill as non hazardous material. 2. Remove existing geonet and haul to landfill as non hazardous material. 3. Install new Tenax TD Triplanar Geonet under biofilter media 4. Install 1000 cyds biofilter media provided by Van Brunt Transport 5. Restore grass areas disturbed by our work. **General Conditions:** 1. Bonds, permits and inspection fees are not included. 2. Test of existing biofilter media is not included. 3. All material being removed is considered non hazardous. 4. Proposal is based on removing and suppling 1000 cyds of biofilter media. 5. Replacement of grass pavers is not included in above price. 6. Biofilter media supplier is the approved supplier from 2013 project 7. If existing Geonet can be reused then deduct $7,000.00		
		Subtotal	$ 84,500.00
		Shipping	
		TOTAL	$ 84,500.00

Office Use Only

6052 Starville Rd, Marine City, MI 48039

(810) 765-1426 Fax (810) 765-1460 www.cortisbros.com

Macomb County Biofilter – Biofilter Media Submittal Review

Prepared for: Jon Bixby, P.E., Giffels Webster

Prepared by: Jim Joyce, P.E., V&A

Reviewed by: Brian Huang, E.I.T., V&A

Date: November 7, 2013

Shop Drawing Transmittal No.: Biofilter Media Samples. OMCPWC Project No. 09-0014.24

Transmittal Date: October 25, 2013

Submittal Title: Biofilter Media Samples: Van Brunt Transport, Inc.

V&A CONSULTING ENGINEERS, INC.
SHOP DRAWING REVIEW

NO EXCEPTIONS TAKEN [X] AMEND AND RESUBMIT [ ]
EXCEPTIONS NOTED [ ] REJECTED - RESUBMIT [ ]

REVIEWED BY: JJ DATE: 11/5/2013

CORRECTIONS OR COMMENTS MADE ON CONTRACTOR'S SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH CONTRACT DRAWINGS AND SPECIFICATIONS. THIS SHOP DRAWING HAS BEEN REVIEWED FOR COMPLIANCE WITH THE DESIGN CONCEPT AND GENERAL COMPLIANCE WITH THE CONTRACT DOCUMENTS ONLY. CONTRACTOR IS RESPONSIBLE FOR CORRELATING ALL QUANTITIES AND DIMENSIONS, FABRICATION PROCESSES AND TECHNIQUES, COORDINATING WORK WITH THE OTHER TRADES AND SATISFACTORY AND SAFE PERFORMANCE OF THE WORK.

Comments:

The organic biofilter media sample submitted from Van Brunt Transport Inc. was composed primarily of fractured, used, softwood pallets. The shape and size of the particles was consistent with tub ground, recycled, single-use pallets. The shape of the media particles is good with maximum length to maximum width ratios between 5 and 10. The preferred L/W ratio is between 6 and 10. The moisture level and pH were acceptable. There is very little dirt and other foreign material in the sample.

This sample is accepted as a source for the biofilter media. Figure 1 shows the biofilter media with an engineering scale as a reference.

TENAX TD TRIPLANAR Geonet

TENAX TD Triplanar Geonets are innovative high performance geonets consisting of thick supporting ribs with diagonally placed top and bottom ribs. The three sets of intersecting strands form unique flow conduits that provide extremely high flow capacity, high compressive resistance and enhanced tensile properties. TENAX TD is manufactured from the extrusion of high density polyethylene resin and carbon black. TENAX TD is inert to chemical and biological attack and is stabilized against UV degradation.

Typical Applications:
Landfill leachate collection in landfill liners, Leak detection, Gas venting media

TESTED PROPERTY	TEST METHOD	FREQUENCY	MINIMUM AVERAGE ROLL VALUE[1]		
			TENDRAIN 3	TENDRAIN 5	TENDRAIN 7
Geonet Thickness[2], mil	ASTM D 5199	1/50,000 ft^2	250	275	300
Transmissivity[4], m^2/sec	ASTM D 4716	1/200,000 ft^2	3.0×10^{-3}	4.0×10^{-3}	5.0×10^{-3}
Creep Reduction Factor[3], @ 20° C	GRI-GC8	per formulation	1.2 @ 4,000 psf	1.3 @ 10,000 psf	1.2 @ 25,000 psf
Tensile Strength (MD)[2], lb/in	ASTM D 4595	1/50,000 ft^2	625	1,000	1,200
Density, g/cm^2	ASTM D 1505	1/50,000 ft^2	0.94	0.94	0.94
Melt Flow Index, gal/10 min	ASTM D 1238	1/50,000 ft^2	1.0	1.0	1.0
Carbon Black Content[2], %	ASTM D 4218	1/50,000 ft^2	2.0	2.0	2.0

DIMENSIONS AND DELIVERY[2]

The geonet shall be delivered to the job site in roll form with each roll individually identified and nominally measuring 6.7-FT in width and 200-FT in length or 13.1-FT in width and 200-FT in length.

Notes

1. Unless indicated otherwise, values shown are minimum average roll values.
2. Nominal values.
3. Creep Reduction Factor is based on 10,000 hour test duration, extrapolated to 30 years.
4. Geonet transmissivity is measured by manufacturer as per ASTM D4716 at a normal load of 10,000 psf with testing boundary conditions as follows: steel plate / geonet / steel plate and seating period of 1 hour.

Tenax warrants that the geonet products delivered hereunder conform to the stated specification at the time of delivery. All other warranties including claims for performance or suitability for application are excluded. This product specification supersedes all prior specifications for the product described above and is not applicable for products shipped before November 2014.

R.G. Eisenhardt Contracting, Inc.

9738 Gratiot, Columbus, MI 48063

Telephone: (586) 727-2233 **Fax (586) 727-7170**

Macomb County Public Works

5/4/2019

Attn: Tom Stockel

Removal and replacement of wood chips and geotextile fabric from bio-filters at 15 mile site.

Our firm will supply all necessary labor, operators, supervision, equipment and materials to perform the following;

1. Mobilize all necessary equipment.
2. Remove all existing wood chips from all three cells.
3. Load and haul all woodchips to a landfill or others for disposal.
4. Remove all existing fabric from under woodchips.
5. Load and haul fabric to a landfill or others for disposal.
6. Supply and place new fabric same as supplied by original suppliers.
7. Supply and place 1,000 yds. of woodchips same as supplied by the original supplier.
8. Restore all work areas back to original.
9. Demobilize all equipment.

Total price $86,250.00

Note; This quote is based on woodchips and fabric being classified as non-hazardous waste.

Thank you for the opportunity to quote this work.

Robert G. Eisenhardt

Doetsch
ENVIRONMENTAL SERVICES
21221 Mullin Ave. Warren MI 48089

April 20, 2019

Steve Rozycki, P.E.
Engineer II -- Wastewater Services
Macomb County Public Works
21777 Dunham Road
Clinton Township, MI 48036

RE: MIDD Fraser Biofilter Removal

Mr. Rozycki,

Doetsch Environmental Services will provide necessary vacuum equipment and labor to remove the wood chips from the biofilters:

- Vacuumed from the cells and stockpiled onsite prior to load out
- Debris to be hauled to landfill
- Estimated 740 cubic yards

30 -40 yards removed per day

I am trying to get in contact with a composter to take the wood chips, the mulch is typically used for odor control during the composting process.

Estimate: 18-24 days @ $3,200.00 per day

Disposal and trucking: $30-$40 per ton (total weight is unknown)**

** An educated guess, need to work on hard numbers.

Thank you for the opportunity to be of service,

Joseph G Schotthoefer IV

Candice S. Miller
Public Works Commissioner
Macomb County

To: Candice Miller, Macomb County Public Works Commissioner

CC: Brian Baker, Chief Deputy

From: Vincent Astorino, Operations & Flow Manager

Date: May 7, 2019

Subject: MID Flow Meters Recommendation

The MIDDD budgeted $300,000 to install flow meters throughout the various interceptors in the system for this current fiscal year. A flow meter is a system that is used to measure sewage levels and velocities within the interceptor. From this we are able to determine how much storage volume we have in the interceptors and how fast that sewage is moving. They are also excellent tools for identifying problems before they happen. One example of this would be if blockages are starting to form upstream/downstream of the meters we will see it first in this data and can respond quickly to address a problem rather than waiting until it's too late. The MIDDD has been operating blind since taking over the system which is something that we are trying to change. The more data that we can provide to the operators will allow them to make better decisions and respond to issues much quicker. This will ultimately help prevent sinkholes, basement backups, and sanitary sewer overflows. Currently there is only one flow meter in the mainline interceptors which is located near 15 Mile and Schoenherr. This meter was the most important asset in the system during the 15 Mile Interceptor Collapse in 2016 as it provided critical operations data. All of the other billing meters are connected to the local systems and then drop into the main interceptors so we are truly blind when it comes to what is happening in the MID interceptors.

Our group has put together a plan to install 4 additional meters throughout the interceptors. Attached you will find a map showing each location and how they have been strategically placed to provide critical data throughout the MID interceptors.

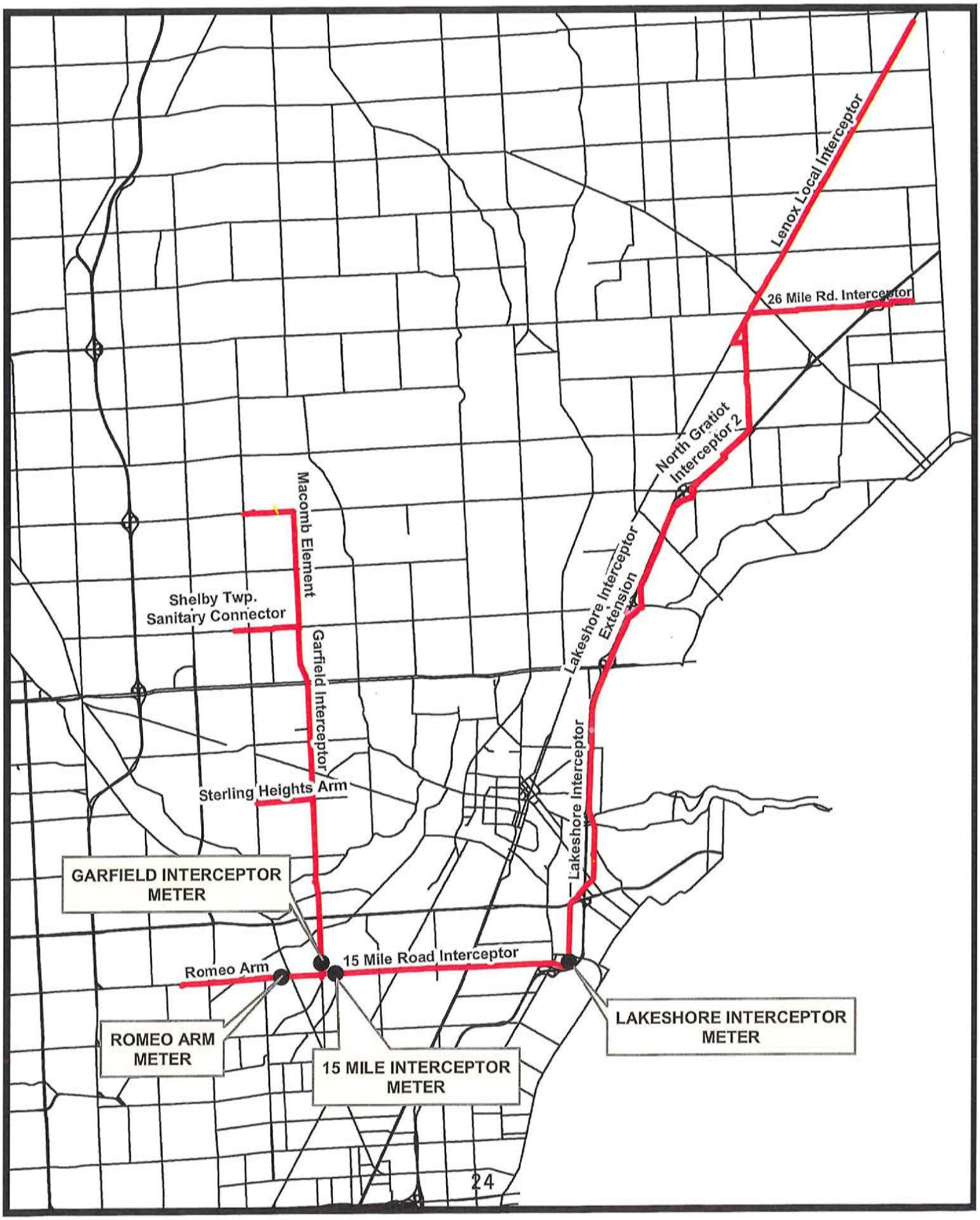
For this work, we took a slightly different approach to gathering quotes. Since there are only really two qualified contractors (ADS and Hesco) in the area and from vast experience, costs between the two are very similar. We proposed that each company provide a free demo for 30 days to prove out that their system would fit our needs. Both contractors would install a demo meter one manhole apart from one another and they would need to meet a series of qualifications that we set forth. This included quality data logged, ease of maintenance, and the ability to transmit data remotely to our SCADA system to name a few. Both systems worked very well with our first two parameters but only the ADS equipment was able to successfully accomplish the task of sending data into our SCADA system. Therefore, ADS met our parameters and we have asked them for pricing to purchase

the meters and then maintain them for 6-months which is when our new maintenance contract will be established.

I recommend moving forward with the ADS proposal in the total not-to-exceed amount of **$46,200**. We are still working on getting electrical panels installed for each location and will return seeking approval once that is ready, but we still have $253,800 to work with and I plan to keep us under budget.

Attachments: ADS Quote – 5/7/19

MID PROPOSED FLOW METERS



340 The Bridge Street, Suite 204
Huntsville, AL 35806
256-430-3366
www.adsenv.com
A Division of ADS LLC

ADS Environmental Services
1100 Owendale Drive – Suite K
Troy, MI 48083
Chris Skehan (708.341.9701)
Email: cskehan@idexcorp.com

Macomb County Public Works
21777 Dunham Road
Clinton Township, MI 48036
Steve Rozycki (586.696.0235)

Quote Reference: MacombCo.MID.EQP.MI19
Date: May 7, 2019
Terms: Net 30
Shipment: FOB Shipping Point (to ADS office)
Delivery: 30 Days ARO
Effective To: 6/7/2019

<<HARDWARE & INSTALLATION>>

Part Number	Quantity	Unit Retail Price	Extended Price
Triton+ KIT with Dual Sensor Setup (CS4/CS5/CS7) • Triton+ Area Velocity Flow Meter. (8000-FST-IM-EP-4VZ) • 2x Combo Sensors (CS4 or CS5 or CS7), with 30-35' cables - Slimline U/S, V-Peak, Pressure 0-5/15 PSI. (8K-CS4-15-35) and/or (8K-CS5-V2-05-30) and/or (8K-CS7-10-35) • Installation Band and Mounting Hook. (IKIT) • Wireless Antenna 4G, SMA, with 12' cable. (9000-0080) • Verizon Wireless 4G LTEm SIM. (pre-installed)	4	$6,450.00	$25,800.00
Professional Installation Professional Installation, Programming, and Commissioning of ADS Triton+ Systems by ADS Field Services	4	$1,200.00	$4,800.00
Hardware and Installation Total			**$30,600.00**

<<TURNKEY SERVICES>>

Part Number	Quantity	Unit Retail Price	Extended Price
Turnkey Services, Operation and Maintenance and Analysis • See Below for Description of Turnkey Services	4	$650.00/month	$2,600.00
Services Total for May through October (6 months)			**$15,600.00**

<<TOTAL>>

Total for Hardware, Installation and 6 Months Services	**$46,200.00**

NOTES:

1. The above prices include all of the required labor and materials to support the installation of the flow monitors.
2. The above prices do not include any special, modified, or custom documentation or manuals that may be required. Standard ADS Environmental Services manuals, appropriate to the flow monitors delivered, are included with the equipment.
3. ADS Field Crews to select most appropriate sensor combination setup after site investigations (CS4/CS5/CS7).
4. Sale of the above equipment and software is subject to acceptance of ADS Environmental Services Equipment Sale Agreement. Activation of software requires users to execute ADS Environmental Services Software License Agreement.
5. Acceptance of this proposal for the purchase of ADS Products constitutes you and/or your company's agreement to ADS' Standard Terms and Conditions of Sale found at http://www.adsenv.com/equipt-service-terms-conditions. ADS' Terms and Conditions supersede any terms and conditions in any documentation submitted by you and/or your company as a buyer of ADS products
6. Turnkey Flow Monitoring Services Details Listed Below

Client Name:	**ADS LLC**
_____	_____
Signature	**Signature**
_____	_____
Printed Name/Title	**Printed Name/Title**
_____	_____
Date	**Date**

Turnkey Flow Monitoring Services from ADS

As part of a Services Agreement, ADS will perform the following services on the installed ADS Flow Monitors or ADS Hardware for the Owner/Customer/Client. These services include the following:

A. **Remote Diagnostics:** Remote diagnostic and inspection (wireless equipment) will be utilized at all locations. ADS will ensure wireless telemetry is working correctly at any unit that has this feature.

B. **Turnkey Maintenance:** Preventative maintenance services necessary to keep the equipment operating in accordance with the manufacturer's design specifications. The types of services to be performed under this Agreement include but are not limited to the following:

- **Communication link failures** (no connection)
- **Depth Sensor Troubleshooting** (cleaning, scrubbing, adjusting, and/or other common flow monitoring troubleshooting procedures by a certified ADS field service crew); Includes all depth sensors installed
- **Velocity Sensor Troubleshooting** (cleaning, scrubbing, adjusting, and/or other common flow monitoring troubleshooting procedures by a certified ADS field service crew); Includes all velocity sensors installed
- **Rain Gauge Troubleshooting** (cleaning/cleaning debris from the bucket or issues that may arise with the ADS data logger/wireless telemetry)
- **ADS SCADA Modules** (communication errors on the ADS hardware side or issues that may arise for the XIO, XBUS, or ExPac Systems)

C. **Service Schedule:** The field service shall accommodate normal operating hours of 8:00 a.m. to 5:00 p.m. Monday through Friday (service during holidays or outside of normal business hours shall be at ADS's current Time and Materials rate).

D. **Response Time:** ADS will investigate and troubleshoot perceived problems within three to five (3-5) business days of discovery of the malfunction.

<u>Data Processing and Analysis Services</u>

As part of this Service Agreement, ADS will provide data processing services for all of the monitoring equipment installed including data collection, data auditing, and data editing including:

A. **Data Collection:** An ADS data analyst will review each location information file for each site and create a site sheet. The analyst will collect data from each monitoring location twice weekly. If the monitor does not collect successfully, the analyst schedules service and a manual collect for the site.

B. **Data Auditing:** The data analyst reviews the collected data at each site twice weekly. The Analyst will review the data for regular diurnal patterns in free flow; reasonable depths and velocities for the site; or to see if the site is influenced by obstructions. If data appears compromised, the analyst schedules a service call.

C. **Data Finalization:** An ADS Data Analyst will edit the collected data to remove data spikes/drops, add and compare confirmation points, and investigate data gaps. All edited data is reviewed and confirmed by an ADS Project Manager, Senior Data Analysis or Data Manager to ensure maximum quality and accuracy. The finalized data is included to create the monthly report and a library of final data.

D. **Final Data Review:** A Senior Data Analyst, or Project Manager, or Project Engineer Assistant will review all final data and reports before they are delivered. This includes a detailed checklist which includes the following: Pipe shape; Pipe dimensions; Physical offset; Average to Peak application; DFINAL composition; Velocity Data editing; Gain values; Scattergraph; Hydraulic Coefficient (if applicable); QFINAL selection; Silt; and Comparison to upstream and downstream locations (if applicable).

Data Deliverables

ADS will provide the Owner/Customer/Client with all the data collected during each monthly flow-monitoring period. The installation sheets will provide a brief narrative summary of observed flow conditions and will be made available through our online system. Both raw and final data will be provided via ADS FlowView.com or PRISM web hosted systems.

A. **Access:** ADS will provide secure access to the FlowView/PRISM system for the client and others designated employees. Users receive a unique login and password to access the web based system. In addition to web based data access and reporting tools, ADS software can provide the following features:

- Automated data collection and data warehousing;
- Smart Logic support of real time alarming to reduce data abnormalities and increase alarm reliability;
- Location Mapping of all monitors deployed for this study;
- Built in flow meter performance monitoring including sensor health;
- Interactive graphing displays, such as Hydrograph and Scattergraphs;
- Data exporting tools/templates;
- Permission-based data sharing including documents and reports;
- Customer support center available via a toll-free number

B. **Reporting:** ADS will provide the Owner/Customer/Client with the ability to generate and examine predefined or user defined, interactive reports using the ADS FlowView reporting system. FlowView/PRISM is a hosted system available via the internet using any web browser software. The system will include the ability to generate and view:

- User defined hydrographs of depth, velocity, flow, and rain for each site;
- Scattergraphs for each site;
- Monthly rainfall hyetographs;
- Tabular depth, velocity, flow, and rain data in a user defined format;
- Detailed site reports with digital photographs on the monitor installations;
- Monthly service reports

C. **Library of Final Data:** ADS will store all of the raw and edited final level, velocity, flow and rainfall data within the ADS FlowView and or PRISM system, which will be available to the Owner/Customer/Client as needed during the project, and up to 60 days after the end of the project. All finalized data will be posted to the system 30 days after the end of the month (eg. All June Data will be posted by July 30th). All finalized data points will also be stored and accessible along with the raw data collected

Client Responsibilities

ADS ask that *the client* perform the following functions in connection with this Project:

1. Access to the site of work with sufficient area for placement of personnel and equipment, including all right-of-way and ramps, if required. This includes, but is not limited to, exposing manholes, clearing easements and/or constructing roads or ramps suitable for truck/van, if necessary.
2. Assist in obtaining and complying with any special permits.
3. Provide a map or currently installed monitoring locations.
4. Any information concerning bypasses, overflows, base flows, critical surcharge areas, and maintenance habits that may affect flow monitoring data.
5. Any information regarding the basin size in acres and upstream LF of pipe segments.
6. (if required) Suitable locations for the Rain Gauge Devices, ideally on a roof or raised structure with no overhead obstructions (Trees, Roofs, Poles, Etc.)
7. Traffic Assistance if complex lane closures or multiple safety crews are required

Exclusions: Unless agreed upon between both parties, the following exclusions would apply to this project:

- changes or alterations in specifications;
- additional installation, moving, or removing of equipment except that which is outlined or required as part of this agreement;
- repairs made necessary by accident of *the client*, its employees, agents, contractors or invitees;
- repairs made necessary due to attempts by *the client* to repair or maintain the equipment unless authorized by ADS;
- maintenance and repair necessary to put equipment not under the comprehensive scheduled service contract in good repair;
- equipment repair or replacement outside manufacturer's design specifications; and
- repairs made necessary due to events beyond ADS's control (*force majeure*)

ADS TRITON+®

The ADS TRITON+® is an intrinsically safe, "Fit-for-Purpose" open channel flow monitor for use in sanitary, combined, and storm sewers. It is designed to be the most versatile flow monitoring system available for wastewater collection applications. It supports single pipe or dual pipe flow measurement installations.

ADS TRITON+

This multiple technology flow monitor will power almost every available sensor technology that is used in wastewater applications today. It is the most versatile and cost-effective, multiple-technology flow monitor on the market. The ***TRITON+*** includes four multiple technology sensor options: a Long Range Depth Sensor, a Peak Combo Sensor, a Surface Combo Sensor, and an Ultrasonic Level Sensor (see inside for technology and specifications). This array of monitoring technologies provides for unmatched flexibility in a fully integrated, fit-for-purpose monitoring platform.

The ***TRITON+*** platform adapts to a wide range of customer applications and budgets. It can be configured as an economical single sensor monitor or dual sensor monitor. It offers a longer battery life and fewer parts for a more reliable system. This provides a lower purchase price and a lower ownership cost over the life of the monitor. The ***TRITON+*** has the lowest operational cost per data sample of any Intrinsically Safe flow monitor available.

About ADS

A leading technology and service provider, ADS® LLC has established the industry standard for open channel flow monitoring and has the only ETV-verified flow monitoring technology for wastewater collection systems. These battery-powered monitors are specially designed to operate with reliability, durability, and accuracy in sewer environments.

TRITON+ Features

- Versatile performance that is easy to install and operate
- Two sensor ports supporting 4 interchangeable sensors providing up to 6 sensor readings at a time
- Single or dual pipe/monitoring point measurement capabilities
- Multi-carrier cellular 3G/4G UMTS/HSPA+ or Verzon® CDMA/EV-DO wireless communications; direct serial communications also available
- Industry-leading battery life with a wireless connection providing up to 15 months at the standard 15-minute sample rate (*varies with sensor configuration*)
- External power and Modbus network connectivity option available with an ADS External Power and Communications Unit (ExPAC™) and a 9-36 VDC power supply or an ADS XBUS™ which includes a power supply
- Analog and digital I/O expansion (4-20 mA and dry contacts) available with an ADS External I/O unit (XIO™)
- Modbus protocols enabling RTUs to help simplify SCADA system integration
- Supports the delivery of CSV files to an FTP site at user-defined intervals , and direct monitor SMS and e-mail messaging
- Supports actuation of a water quality sampler for flow proportional or level-based operation
- Monitor-Level Intelligence (MLI®) enables the ***TRITON+*** to effectively operate over a wide range of hydraulic conditions
- Superior noise reduction design for maximizing acoustic signal detection from depth and velocity sensors
- Five software packages for accessing flow information: Q*start*™ (configuration and activation); FlowView Operations (web-based alarming); Sliicer.com® (I/I analysis); FlowView Portal® (online data presentation and reporting); and Profile® (data collection, analysis, and reporting)
- Intrinsically-Safe (IS) certification by ATEX, IECEx and CSA for use in Zone 0 (equivalent to Class I, Division 1, Groups C & D) hazardous areas
- Thick, seamless, high-impact, ABS plastic canister with aluminum end cap (meets IP68 standard)
- Innovative circuit board dome-enclosure protects and limits exposure of electronics when opening the canister to change the battery

To Learn more, visit www.adsenv.com/TRITON+

Multiple Technology Sensors

The ***TRITON+*** features three depths and two velocities with three sensor options. Each sensor provides multiple technologies for continuous running of comparisons.

Peak Combo Sensor

Dimensions: 6.76 inches (172 mm) long x 1.23 inches (31 mm) wide x 0.83 inches (21 mm) high

This versatile and economical sensor includes three measurement technologies in a single housing: ADS-patented continuous wave peak velocity, uplooking ultrasonic depth, and pressure depth.

Continuous Wave Velocity
Range: -30 feet per second (-9.1 m/s) to +30 ft/sec (9.1 m/s)
Resolution: 0.01 feet per second (0.003 m/s)
Accuracy: +/- 0.2 feet per second (0.06 m/s) or 4% of actual peak velocity (whichever is greater) in flow velocities between -5 and 20 ft/sec (-1.52 and 6.10 m/s)

Uplooking Ultrasonic Depth
Performs with rotation of up to 15 degrees from the center of the invert; up to 30 degrees rotation with Silt Mount Adapter
Operating Range: 1.0 inch (25 mm) to 5 feet (152 cm)
Resolution: 0.01 inches (0.254 mm)
Accuracy: 0.5% of reading or 0.125 inches (3.2 mm), whichever is greater

Pressure Depth
Range: 0-5 PSI up to 11.5 feet (3.5 m); 0-15 PSI up to 34.5 feet (10.5 m); or 0-30 PSI up to 69 feet (21.0 m)
Accuracy: +/-1.0% of full scale
Resolution: 0.01 inches (0.25 mm)

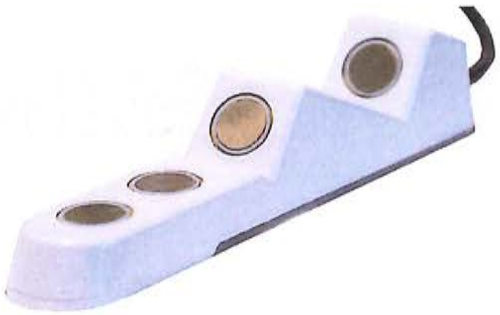
Long Range Depth Sensor

Dimensions: 9.15 inches (232.4 mm) long X 4.40 inches (111.8 mm) wide x 4.22 inches (107.2 mm) high (without bracket)

A narrow, powerful ultrasonic beam allows this depth sensor to perform well over long ranges.
Integral Submersion Sensor provides detection of flooding at the point of interest.

Long Range Ultrasonic Depth
Minimum Dead Band: 0.0 inch (0.0 mm) from the bottom of sensor housing; Maximum Operating Air Range: 240 inches (6.1 m)
Beam Angle: +/- 3 degrees
Resolution: 0.01 inch (0.24 mm)
Accuracy: +/- 0.25% of sensor range measurement or 0.13 inches (3.2 mm) whichever is greater, in a homogeneous temperature air column
Drift: 0.0 inches (0.0 mm)
Temperature Compensation: Additional compensation for variable temperature air column supported

Submersion
Detects submersion when fully covered with liquid.



Surface Combo Sensor

Dimensions: 10.61 inches (269 mm) long x 2.03 inches (52 mm) wide x 2.45 inches (62 mm) high

This revolutionary new sensor features four technologies including surface velocity, ultrasonic depth, surcharge continuous wave velocity, and pressure depth.

Surface Velocity *
Minimum air range: 3 inches (76 mm) from the bottom of the rear, descended portion of the sensor
Maximum air range: 42 inches (107 cm)
Range: 1.00 to 15 feet per second (0.30 to 4.57 m/s)
Resolution: 0.01 feet per second (0.003 m/s)
Accuracy: +/-0.25 feet per second (0.08 m/s) or 5% of actual reading (whichever is greater) in flow velocities between 1.00 and 15 ft/sec (0.30 and 4.57 m/s)

** The flow conditions existing in some applications may prevent the surface velocity technology from being used.*

Ultrasonic Depth
(Does not require electronic offsets)
Minimum dead band: 1.0 inches (25.4 mm) from the face of the sensor or 5% of the maximum range, whichever is greater
Maximum operating air range: 10 feet (3.05 m)
Resolution: 0.01 inches (0.25 mm)
Accuracy: +/- 0.125 inches (3.2 mm) with 0.0 inches (0 mm) drift, compensating for variations in air temperature

Surcharge Continuous Wave Velocity *(Under submerged conditions, this technology provides the same accuracy and range as* **Continuous Wave Velocity** *for Peak Combo Sensors)*

Surcharge Pressure Depth *(Under submerged conditions, this technology provides the same accuracy and range as* **Pressure Depth** *for Peak Combo Sensors)*

Ultrasonic Level Sensor This non-intrusive, zero-drift sennsing method results in s stable, accurate, and reliable flow depth calculation. Two independent ultrasonic transducers allow for independent cross-checking.

TRITON+ Specifications

Connectors

U.S. Military specification MIL-C 26482 series 1, for environmental sealing, with gold-plated contacts

Communications

- Domestic coverage, Verizon® 4G LTE-M modem, FCC ID: R17ME910C1NV
- Global coverage , commercial UMTS/HSPA+/GSM modem, FCC ID: R17HE910
- Domestic coverage, Verizon CDMA/EV-DO modem, FCC ID: R17DE910-DUAL
- Direct connection to PC using an ADS USB serial cable

Monitor Interfaces

- Supports simultaneous interfaces with up to two combo sensors
- Supports optional Analog and Digital I/O with ADS XIO: two 4-20 mA inputs and outputs, two switch inputs and two relay outputs

Power

Internal - Battery life with a cellular modem:

- Over 15 months at a 15-minute sample rate*
- Over 6 months at a 5-minute sample rate*

External - Optional external power available with ADS External Power and Communications Unit (ExPAC) with an ADS- or customer-supplied 9-36 Volt DC power supply

* *Rate based on collecting data once a day and varies according to sensor configuration and operating temperature*

Operating and Storage Temperature

-4 degrees to 140 degrees F (-20 degrees to 60 degrees C)

Connectivity

- Modbus ASCII: Wireless; Wired using ADS ExPAC or XBUS
- Modbus RTU: Wireless; Wired using ADS ExPAC or XBUS
- Modbus TCP: Wireless only

Intrinsic Safety Certification

- Certified under the ATEX European Intrinsic Safety standards for Zone 0 rated hazardous areas
- Certified under IECEx (International Electrotechnical Commission) Intrinsic Safety Standards for use in Zone 0 rated hazardous areas (equivalent to Class I, Division 1, Groups C & D)
- CSA Certified to Class 225803 – Process Control Equipment, Intrinsically Safe and Non-Incendive Systems – For Zone 0 Hazardous Locations, Ex ia IIB T3 (152°C) in Canada
- CSA Certified to Class 225883 – Process Control Equipment, Intrinsically Safe and Non-Incendive Systems – For Class I Zone 0 Hazardous Locations, AEx ia IIB T3 (152°C) in the USA (equivalent to Class I, Division 1, Groups C & D)

Other Certifications/Compliances

- FCC Part 15 and Part 68 compliant
- ROHS (lead-free) compliant
- Carries the EU CE mark
- Canada IC CS-03 compliant

Connected by VERIZON

ISO 9001 Registered Company — sira CERTIFICATION — UKAS MANAGEMENT SYSTEMS 011

Certificate No: 940056

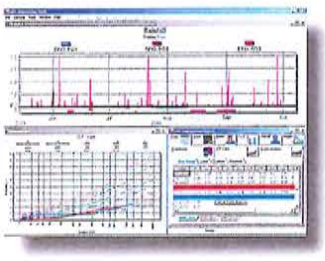
ADS Flow Monitoring Software

Q*start* is desktop software providing field crews with a simple, easy-to-use tool for quickly configuring and activating ADS monitors. Q*start* enables the user to collect and review the monitor's depth and velocity data in hydrograph and tabular views simultaneously.

FlowView is web-hosted software providing near real-time operational intelligence on the status of flow activity throughout the wastewater collection system. FlowView utilizes dynamic (or smart) alarming to inform clients about the occurrence of rain events, flow performance abnormalities, and data anomalies at the flow monitoring locations.

FlowView Portal is web-hosted software providing robust report delivery, enabling the user to manage data, customize reports, and select viewing parameters. FlowView Portal has a virtually unlimited database for storing and accessing historical data, using data for comparison and trend analysis purposes, and sharing information electronically.

Sliicer.com is web-hosted software providing a powerful set of engineering tools designed for both the consulting and municipal engineer. Sliicer.com's inflow and infiltration tools examine wastewater collection system dry and wet weather flow data and provide rigorous performance measurements in one-tenth the time of other analysis tools.



Profile is desktop software providing the industry's best data analysis tools, from basic flow monitoring data to complex hydraulic analysis. Profile is intuitive software that saves time and improves data quality by compiling project data into one location for analysis and reporting.

FLOW MONITORING APPLICATIONS

- Billing
- Inflow/Infiltration
- Model Calibration
- Combined Sewer Overflows (CSOs)
- Stormwater Monitoring
- Capacity Analysis
- Spill Notification

ADS' Self-Contained Solutions for Power, Communication, Analog and Digital I/O and Modbus

The ***TRITON***+ COMM+EXT PWR port is used for external power via the ADS XIO, XBUS or ExPAC devices, delivery of Modbus output values as well as for on-site, direct monitor communication.

XIO Features

- Process variables measured by the ***TRITON***+ can be converted to two (2) 4-20mA loop output signals for SCADA systems or local display and control
- Logging capabilities of the ***TRITON***+ can be used for two (2) 4-20mA input process variables measured by other instrumentation
- Alarms produced by the ***TRITON***+ Monitor Level Intelligence (MLI) device can be output on the two (2) XIO relay contacts for process actuation
- Two (2) switch, solid state or dry contact digital inputs can be sampled and logged
- Design facilitates easy field wiring
- Supports easy plug and play configuration and start-up
- Associated Apparatus IECEx certification for use with approved equipment in Zone 0 (equivalent to Class I, Division 1, Groups C & D); ATEX Zone 0; and CSA Class I, Zone 0, IIB hazardous areas
- Rugged indoor/outdoor NEMA 4x case with hinged clear cover
- Accepts 85-264 VAC, 120-375 VDC; 47-62 Hz; 1.1A@110/0.59A @250 VAC
- Supplies 8 – 11.5 VDC, 500mA power to the ***TRITON***+ flow monitors

XBUS Features

- Supports Modbus RTU, ASCII and TCP communications
- Wireless Modbus via ***TRITON***+ internal modem communications
- Connects to wired networks via RS485 or RS232
- Supports easy plug and play configuration and start-up
- Associated Apparatus IECEx certification for use with approved equipment in Zone 0 (equivalent to Class I, Division 1, Groups C & D); ATEX Zone 0; and CSA Class I, Zone 0, IIB hazardous areas
- Rugged indoor/outdoor NEMA 4x case with hinged clear cover
- Accepts 85-264 VAC, 120-375 VDC; 47-62 Hz; 1.1A@110/0.59A @250 VAC
- Supplies 8 – 11.5 VDC, 500mA power to the ***TRITON***+ flow monitors

ExPAC Features

- Designed to be housed in another enclosure
- Associated Apparatus IECEx certification for use with approved equipment in Zone 0 (equivalent to Class I, Division 1, Groups C & D); ATEX Zone 0; and CSA Class I, Zone 0, IIB hazardous areas
- Requires DC power input between 9 and 36 volts and a minimum of 15 watts
- Supplies DC power of 8 to 11.5 volts, 500mA to the ***TRITON***+ flow monitors
- RS485 and RS232 Modbus output connections to SCADA systems
- Wireless Modbus via ***TRITON***+ internal modem communications
- Supports Modbus RTU, ASCII and TCP/IP communications

ADS LLC

340 The Bridge Street, Suite 204 - Huntsville, AL 35806
Phone: 256.430.3366/ Fax: 256.430.6633
Toll Free: 1.800.633.7246

Funding Source	Apportionment	Manager	Vendor	Amount	Invoice Detail	Project Summary	Project Balance
Macomb Interceptor Drain	Chapter 20 Chesterfield – 6.9899% Clinton – 20.9164% Fraser – 4.1343% Harrison – 5.9902% Lenox – .8610% Macomb – 14.5180% New Haven – .8150% Shelby – 9.9241% Sterling Heights – 31.2761% Utica – 1.7244% Washington – 2.8507%						
Administration		Baker	Vincent Astorino	$ 1,660.00	Invoice #19-194 - 04.29.19	Reimbursement of Conference Expenses for Astorino and Rozycki	
		Downing	CH2M Hill Engineers, Inc.	$ 29,241.05	Invoice #707997CH007 - 04.17.19	Odor & Corrosion Study	$ 230,103.04
		Downing	CH2M Hill Engineers, Inc.	$ 22,331.08	Invoice #707997CH006 - 03.11.19	Odor & Corrosion Study	$ 259,344.09
		Baker	Dr. Mole Incorporated	$ 4,560.00	Invoice #18011-10 - 03.17.19	Project Plan Review	$ 23,521.17
		Astorino	DTN, LLC	$ 735.75	Invoice #5534057 - 04.19.19	Storm Sentry Subscription	
		Bantios	FK Engineering Associates	$ 13,425.00	Invoice #18-148-001 - 03.14.19	Segment 5 - Sewer Rehab Options	$ 4,475.00
		Bantios	FK Engineering Associates	$ 4,475.00	Invoice #18-148-002 - 04.18.19	Segment 5 - Sewer Rehab Options	
		Astorino	Fishbeck, Thompson, Carr & Huber, Inc.	$ 6,115.00	Invoice #382837 - 04.29.19	WWMP MIDDD through 4.19.19	$ 620,321.30
		Astorino	Fishbeck, Thompson, Carr & Huber, Inc.	$ 786.50	Invoice #382819 - 04.29.19	As Needed Services through 4.19.19	$ 96,933.20
		Astorino	Fishbeck, Thompson, Carr & Huber, Inc.	$ 3,520.50	Invoice #382821 - 04.29.19	GLWA Assistance through 4.19.19	
		Astorino	Kienbaum Hardy Viviano Pelton & Forrest PLC	$ 17,651.75	Invoice #42015 - 04.11.19	General Matters	
		Astorino	Verizon	$ 551.01	Invoice #9828789922 - 04.23.19	Monthly Cell - 03.24.19 - 04.23.19	
15 Mile Sinkhole		Bantios	Anderson, Eckstein & Westrick	$ 1,191.30	Invoice #121612 - 04.18.19	Legal Services	
		Bantios	Kienbaum Hardy Viviano Pelton & Forrest PLC	$ 15,345.00	Invoice #42016 - 04.11.19	Legal Services	
		Bantios	Kienbaum Hardy Viviano Pelton & Forrest PLC	$ 7,000.00	Invoice #41736 - 03.06.19	Legal Services	

Funding Source	Apportionment	Manager	Vendor	Amount	Invoice Detail	Project Summary	Project Balance
Meters		Bantios	Anderson, Eckstein & Westrick	$ 21,601.50	Invoice #121632 - 04.18.19	MIDD Dropshaft & Connecting Sewer Rehab	$ 183,082.40
		Astorino	Ghadys, LLC	$ 50,000.00	Invoice #1003 (FINAL)	Bluewater Phase 2 - 10.01.18 - 03.31.19	
		Astorino	HESCO	$ 22,580.00	Invoice #161024-29 - 04.18.19	Flow Meters Maintenance	$ 187,600.00
		Astorino	HESCO	$ 1,200.00	Invoice #20191227 - 04.26.19	CT-S-7 Meter Maintenance	
		Downing	Hubbell, Roth & Clark, Inc.	$ 1,293.75	Invoice #169420 - 04.18.19	SY-S-1 and SY-S-2 Meter Rehab	$ 37,146.48
		Astorino	Jack Doheny Companies Inc.	$ 1,442.91	Invoice #A20005 - 03.29.19	Confined Space Equipment	
NGI		Rozycki	Wade Trim	$ 3,361.25	Invoice #M2014454 - 04.26.19	As-Needed Services 03.23.19 - 04.19.19	$ 22,102.25
SEMSD		Astorino	Fishbeck, Thompson, Carr & Huber, Inc.	$ 9,204.50	Invoice #382856 - 04.29.19	SEMSD WWMP paid by SEMSD	$ 193,346.85
			Total	$ 239,272.85			

Budget to Actual
MIDDD
As of April 30, 2019 = 83%

DESCRIPTION	2019 FINAL BUDGET	ENCUMBERED	ACTUAL	REMAINING BUDGET	PCT UTILIZED
REVENUE ACCOUNTS					
GLWA-OMID	52,458,900		39,222,412	13,236,488	74.8%
OMID O&M	2,391,427		1,594,289	797,138	66.7%
Reimbursements	125,000		268,406	(143,406)	214.7%
Grants/SRF Funding	500,000		330,093	169,907	66.0%
PY Revenue-Fund Balance	3,325,000			3,325,000	0.0%
Sale of Land	-		100,742	(100,742)	100.0%
Reimb-Local Communities	8,989,650		6,742,249	2,247,401	75.0%
Surplus	3,000,000			3,000,000	0.0%
Interest	30,000		267,536	(237,536)	891.8%
Total Revenue Accounts	70,819,977	-	48,525,728	22,294,249	68.5%
EXPENSE ACCOUNTS					
GLWA-OMID	52,458,900		39,642,531	12,816,369	75.6%
OMID O&M	2,391,427		1,793,570	597,857	75.0%
Public Works Wastewater Disposal Division	1,602,641		815,737	786,904	50.9%
Administration and Operations	288,653		248,378	40,275	86.0%
SCADA	151,626		91,326	60,300	60.2%
Engineering					
As Needed FTCH	75,000		51,102	23,898	68.1%
AS Needed CH2M	75,000		24,446	50,554	32.6%
As needed FK Engineering	75,000		25,333	49,667	33.8%
As Needed Wade Trim	75,000		40,434	34,566	53.9%
AS Needed Metco	75,000		5,338	69,662	7.1%
As Needed Applied Science	75,000		20,700	54,300	27.6%
Meter Dye Dilution Testing/As needed	100,000			100,000	0.0%
Engineering Design for MID repairs	1,000,000		17,900	982,100	1.8%
Drop Shaft Repairs(MA-S-2),CT-S-2, HR-S-2, ST-S-5,UT-S-1)	4,000,000		30,524	3,969,476	0.8%
SY-S-1 & SY-S-2 Meter Rehab	1,000,000		72,555	927,445	7.3%
System wide odor and corrosion study	500,000		182,503	317,497	36.5%
Lining Evaluation	-		24,861	(24,861)	100.0%
McMARS Operations	50,000		6,948	43,052	13.9%
SAW Engineering	625,000		42,137	582,863	6.7%
Bluewater	100,000			100,000	0.0%
Eng Meter Rehab Design(SYS-1 & SYS-2)	250,000			250,000	0.0%
Drop Shaft Repair	2,000,000		214,088	1,785,912	10.7%
Wastewater Master Plan/Contract Capacity	600,000		442,116	157,884	73.7%
Level Sensors/Pressure/H25	300,000			300,000	0.0%
Legal Services	400,000		196,859	203,141	49.2%
Clintondale PS O&M	550,000		326,140	223,860	59.3%
NGI O&M	371,000		109,720	261,280	29.6%
Meters O&M	330,000		174,432	155,568	52.9%
CS-3 O&M	52,000			52,000	0.0%
Biofilter O&M	304,500		10,019	294,481	3.3%
Contribution Life Cycle Reserve	171,700		85,850	85,850	50.0%
Sewage Disposal Charges - Mt. Clemens	200,000		129,125	70,875	64.6%
Debt Service - Revenue Bonds	572,530		286,265	286,265	50.0%
Total Expense Accounts	70,819,977	-	45,110,937	25,709,040	63.7%

	O&M Balance 6/30/2018	O&M	Total 4/30/2019
Cash - Operating	24,259,763	3,414,791	27,674,554
Accounts Receivable			0
Assets			0
Liabilities			0
Revenues		48,525,728	48,525,728
Expenditures		45,110,937	45,110,937
			0
Equity*	24,259,763		27,674,554

Detail of 2018 Equity*	
Projected reserve at 6/30/2018	15,675,763
Projected Engineering Reserve	3,250,000
Projected Sinkhole Surplus	4,800,000
Life Cycle Reserve	534,000
Use of surplus for 18/19	(3,000,000)

Dec 2016 Sinkhole	
Revenue	75,675,792
Expenditures	71,694,289
Net	3,981,503