OFFICIAL NOTICE AND AGENDA

Kronenwetter Properties and Infrastructure Committee (PIC) Regular Meeting
Kronenwetter Municipal Center
1582 Kronenwetter Drive, Kronenwetter, WI 54455
Village Board Room (Lower Level)

Tuesday, September 6, 2016 – 5:30 P.M.

1. **Call meeting to order**
   a. Roll Call
2. **Public Input (15 minutes)** *Please be advised per State Statute Section 19.84(2), information will be received from the public. It is the policy of this Village that there be a three minute time period, per person, with time extension per the Chief Presiding Officer's discretion; be further advised that there may be limited discussion on the information received, however, no action will be taken under public comments.*
3. **Approval of Minutes:** August 2, 2016
4. **Discussion & Recommendation:** Broadband Forward program-Ordinance
5. **Discussion & Recommendation:** Policy/Procedure on Water Main Interruptions
6. **Discussion & Recommendation:** Motor Grader Lease
7. **Discussion & Recommendation:** Well #2 Pilot Study Proposal for Engineering Service
8. **Reports:**
   a. Water & Sewer Utilities Operator In Charge Report
   b. Public Works Director Report
   c. PIC Financial Report
9. **Adjournment**

Posted:
September 2, 2016
Richard Downey, Village Administrator

Notice: It is possible that members of other governmental bodies of the municipality may be present at the above scheduled meeting to gather information about a subject over which they have decision-making responsibility. No action will be taken by any governmental body at the above-stated meeting other than the governmental body specifically referred to above in this notice.

Requests from persons with disabilities who need assistance to participate in this meeting or hearing should be made at least 24 hours in advance to the Village Clerk's office at (715) 693-4200 during business hours.

UNAPPROVED MINUTES

Properties and Infrastructure Committee (PIC)
Regular Meeting Minutes
August 2, 2016

1. **Call meeting to order by** *Chairman Eiden at 5:30 pm at 1582 Kronenwetter Drive, Kronenwetter, WI 54455 Municipal Center Room A121*
   a. Roll Call
      Members present: *Eiden __, Raczkowski __, Mortensen X__Zagrzebski X__& Pozorski _X_*
      Members absent: *Eiden__X__, Raczkowski__X___, Mortensen ____ Zagrzebski __ & Pozorski____*
      Staff present: Administrator Downey _X_, DPW Gau X__, OIC Thompson X__

2. **Public Input:**.

3. **Approval of Minutes:** July 11, 2016
   MOTION: T*o approve the minutes of July 11, 2016*
   M/S: KELLY Z. / KEN P.

   DISCUSSION:

   VOTE: *Motion Carried unanimously* 3/0

4. **Discussion & Recommendation:** Customer Request -1900 Seville RD – Water Credit
   M/S: KELLY Z. / CRAIG M.
   MOTION: *Recommend to the Village Board that they credit the residential account at 1900 Seville Road 4 units of water and (if the committee so wishes) 4 units of sewer service.*

   DISCUSSION: MOTION TO CREDIT 4 UNITS OF WATER AND SEWER TO 1900 SEVILLE ROAD FOR PAST COLORED WATER ISSUES.

   VOTE: *Motion Carried unanimously* 3/0

5. **Discussion & Recommendation:** LBG Preliminary Report on New Test Borings Locations for 3rd well and change orders to contracts to perform the work.
   M/S: CRAIG M. / KELLY Z.
   MOTION: *Recommend to Village Board to accept LBG findings and approve LBG change order #2 for the amount of $13,313 and Badger Well Drilling est. cost for the amount of $21,520.00.*

   DISCUSSION: Some committee members had a few questions on the matter.
   AGREED TO PUT TOGETHER SPREADSHEET TO MONITER PAST, CURRENT AND PROJECTED COST PERTAINING TO NEW WELL PROJECT.

   VOTE: *Motion Carried unanimously 3/0*

6. **Reports:**
   a. Water & Sewer Utilities Operator In Charge Report
      PIC reviewed OIC report. MARK PRESENTED REPORT AND ANSWERED QUESTIONS.

b. Public Works Director Report
PIC reviewed DPW report. D. GAU PRESENTED REPORT

c. PIC Financial Report
PIC reviewed the financial reports. RICHARD PRESENTED REPORT

7. Adjournment

M/S: KEN P. / CRAIG M.
MOTION: *To adjourn*

DISCUSSION: *None*

VOTE: *Motion Carried unanimously 3/0*

The PIC adjourned at 6:36 pm.

Respectfully submitted on: August 2, 2016
By: CRAIG A. MORTENSEN, PIC Secretary
Approved:

MEETING DATE: 9/6/2016	REPORT TO PIC		AGENDA ITEM # 4
PRESENTING COMMITTEE:	**COMMITTEE CONTACT:**	**STAFF CONTACT:** Richard Downey, Village Administrator	**PREPARED BY:** Richard Downey, Village Administrator

ISSUE: Discussion & Recommendation: Broadband Forward program-Ordinance

ISSUE BACKGROUND/PREVIOUS ACTIONS: The Public Service Commission (PSC) of Wisconsin have available broadband project grants. To move forward with applying for projects they would like to have attached a model ordinance.

While the ordinance does not require much, I would like to get this in place, so if a project to expand broadband service comes along the Village can apply for the grant and work with a provider to have expanded broadband service within the Village.

I would name myself as being the staff member taking the applications, that way we can expedite these projects.

RECOMMENDED ACTION: Make a motion to recommend that the Village Board adopt the Broadband Forward Ordinance with changes made to codify it within the Village ordinances.

COST/BENEFIT ANALYSIS and JUSTIFICATION
(attach separate spreadsheets or other documentation as applicable)

ITEMIZE ALL ANTICIPATED *COSTS* (Direct or Indirect, Start-Up/One-Time, Capital, Ongoing & Annual, Debt Service, etc.)
Codification will probably be about $200. There will also be some work that will have to go with our applications that can be worked into our revised website.

ITEMIZE ALL ANTICIPATED *BENEFITS* (Subjective, Financial, Operational, Service-related, etc.)
This would enable the Village to be designated a Broadband Forward designated community, and would allow the Village to apply for Broadband project funding.

FUNDING SOURCE(s) – Must include Account Number/Description/Budgeted Amt CFY/% Used CFY/$ Remaining CFY
NA

OTHER OPTIONS CONSIDERED:
We could wait until a broadband project comes along to adopt this ordinance, but as it involves minimal cost, and could expedite our grant applications, I see no reason not to adopt this sooner rather than later.

TIMING REQUIREMENTS/CONSTRAINTS:
I would like to get a recommendation from the committee to the Village Board sooner rather than later, so I can get the ordinance crafted to fit within our Village ordinances.

ATTACHMENTS (describe briefly):
Public Service Commission (PSC) Broadband forward ordinance sample.

Broadband Forward! Community Model Ordinance

Public Service Commission of Wisconsin
610 North Whitney Way
Madison, WI 53705

BROADBAND FORWARD! COMMUNITY MODEL ORDINANCE

Introduction

Broadband access is increasingly important to our economy, education and daily life. The state as a whole—citizens, governments, providers, schools and businesses—have an interest in expanding broadband access and usage in underserved areas of the state. The Public Service Commission of Wisconsin (Commission) has been authorized to certify communities as being "broadband ready" by issuing a Broadband Forward! Certification that signals a local unit of government has taken steps to reduce obstacles to broadband infrastructure investment.

Under Wis. Stat. § 196.504(4) a city, village town or county may apply to the Commission for certification as a Broadband Forward! Community. The Commission has prepared this Broadband Forward! Community Model Ordinance and application form to facilitate certification and statewide consistency. If a political subdivision adopts this model ordinance, or enacts its own ordinance and submits a certification that its ordinance meets the statutory criteria in Wis. Stat. § 196.504(5), it is eligible for Broadband Forward! Certification.

Enacting the Broadband Forward! Community Model Ordinance and obtaining Broadband Forward! Certification ensures the local unit of government has streamlined its administrative procedures by appointing a single point of contact for all matters relating to a broadband network project, adhering to a timely approval process, charging only reasonable fees for reviewing applications and issuing permits, imposing only reasonable conditions on a permit and not discriminating between telecommunications service providers.

The Commission also encourages communities seeking Broadband Forward! Certification to apply for Broadband Expansion Grants that are awarded annually. Further information about the Broadband Expansion Grant Program, including application materials, is available at: http://psc.wi.gov/utilityinfo/tele/broadband/grants/bbGrantApplicationPage.htm.

For further information about the application process for Broadband Forward! Certification or for any questions about the Broadband Forward! Community Model Ordinance, please contact Angie Dickison at Angie.Dickison@wisconsin.gov or (608) 267-9138.

BROADBAND FORWARD! COMMUNITY ORDINANCE

ORDINANCE NO. [ ]

An ordinance to create Chapter [ ]; relating to approval of broadband network projects.

The [political subdivision] does enact as follows:

1 **Chapter 1. Broadband Network Project Applications**

2 **SECTION 1.** GENERAL PROVISIONS.

3 **1.1 Purpose and policy.** The purpose of this chapter is to encourage the development of
4 broadband access in the [political subdivision] by reducing administrative obstacles to broadband
5 service providers and coordinating the review of applications to ensure such applications are
6 timely processed. This chapter shall at all times be construed consistent with the aforestated
7 purpose.

8 **1.2 Definitions.** In this chapter:

9 (1) "Applicant" means a person applying for a permit for a broadband network project.

10 (2) "Broadband network project" means the construction or deployment of wireline or
11 wireless communications facilities to provide broadband communications services in the
12 [political subdivision].

13 (3) "Permit" means any local permit, license, certificate, approval, registration, or similar
14 form of approval required by policy, administrative rule, regulation, ordinance, or resolution with
15 respect to a broadband network project.

16 (4) "Written" or "in writing" means information that is inscribed on a tangible medium or
17 that is stored in an electronic or other intangible medium and is retrievable in perceivable form.

18 **1.3 Point of contact.** The [political subdivision] shall appoint a single point of contact for all
19 matters related to a broadband network project. The [political subdivision] shall provide on its

public website the contact information, including the e-mail address, for the point of contact authorized to receive a broadband network project application.

SECTION 2. ELECTRONIC SUBMISSION OF APPLICATIONS. An applicant may sign and file all forms, applications and documentation related to a broadband network project electronically.

SECTION 3. REVIEW OF APPLICATIONS. Notwithstanding any other provision in the [political subdivision's] ordinances, resolutions, regulations, policies or practices to the contrary, the following process shall apply exclusively upon receiving a broadband network project application:

3.1 Completeness review. Upon receiving a broadband network project application the [political subdivision] shall:

(1) Determine whether an application is complete and notify the applicant of the determination by the [political subdivision] in writing within 10 calendar days of receiving an application. If the [political subdivision] does not notify the applicant in writing of its completeness determination within 10 calendar days of receiving the application, the application shall be considered complete.

(2) If the [political subdivision] determines that an application is not complete, the written notification to the applicant shall specify in detail the required information that is not complete. The applicant may resubmit an application as often as necessary until the application is complete.

3.2 Approval or denial of complete applications.

(1) Within 60 calendar days of receiving an application that is complete, or considered complete under sub. (1), the [political subdivision] shall approve or deny the application and provide the applicant written notification of the approval or denial. If the [political subdivision]

1 does not notify the applicant of its approval or denial within 60 calendar days of receiving a
2 complete application, the application shall be considered approved and any required permit shall
3 be considered issued.
4 (2) If the [political subdivision] denies an application, the written notification of the
5 denial under sub. (1) shall include evidence that the denial is not arbitrary and capricious.
6 **SECTION 4.** FEES. Any fee imposed by the [political subdivision] to review an application, issue
7 a permit, or perform any other activity related to a broadband network project shall be
8 reasonable. An application fee that exceeds $100 is unreasonable.
9 **SECTION 5.** INITIAL APPLICABILITY. The treatment of this ordinance first applies to applications
10 received by the [political subdivision] on or after the effective date of this ordinance.
11 **SECTION 6.** EFFECTIVE DATE. This ordinance takes effect on the day after publication.

MEETING DATE: Sept. 6, 2016	REPORT TO PIC	AGENDA ITEM # 5

PRESENTING COMMITTEE:	COMMITTEE CONTACT:	STAFF CONTACT:	PREPARED BY:
PIC	Chris Eiden	Duane Gau DPW	Duane Gau DPW

ISSUE:

Discussion and Action: Construction/Repair/Maintenance Activities Policies – Colored Water

ISSUE BACKGROUND/PREVIOUS ACTIONS:

Over the years the Water Utility has had several cases of Colored Water issues due to disturbance of the water system i.e. Firefighting/training, flushing of hydrants, water main breaks, bulk sales, pool filling and construction of water main extensions

Customers are demanding the Water Utility develop internal policies for Water Distribution System Activities.

Our OIC has drafted Memos dated 7/11/2016 & 8/30/2016 on the subject for discussion with the Property Infrastructure Committee on a set of recommendations.

Staff has reviewed these recommendations and believes it is time for Village Water Utility to formally draft policies for these types of activities.

RECOMMENDED ACTION:

Make a motion to direct staff to draft a formal policy with recommendations from OIC/staff in both memos ***OR*** a policies with modification of the OIC/staff recommendations and to return them to PIC for review and recommendation to the Village Board.

COST/BENEFIT ANALYSIS and JUSTIFICATION
(attach separate spreadsheets or other documentation as applicable)

ITEMIZE ALL ANTICIPATED *COSTS* (Direct or Indirect, Start-Up/One-Time, Capital, Ongoing & Annual, Debt Service, etc.)

Additional cost of operators/staff time to enforce a new policies. Adjust OIC contract fees for these services

ITEMIZE ALL ANTICIPATED *BENEFITS* (Subjective, Financial, Operational, Service-related, etc.)

The Water Utility customers feel the colored water issues would occur less and keep them informed with these policies.

FUNDING SOURCE(s) – Include Account Number/Description/Budgeted Amt CFY/% Used CFY/$ Remaining CFY

Several accounts with the Water budget maintenance actives.

OTHER OPTIONS CONSIDERED:

Do nothing and operate as in the past on water system disturbance

TIMING REQUIREMENTS/CONSTRAINTS:

Enact new policies starting January 1st 2017

ATTACHMENTS (describe briefly):

1) 7/11/2016 Memo with staff comments in red
2) 8/30/2016 Memo

Memo

To: Dewy, Joanne & Richard

From: Mark

Cc: Fingers

Date: 2016-07-11

Re: **Public notification policies – Potential colored water events - redraft**

I have not been able to find the draft policy I first started in March. The following is a framework for a policy. The paragraphs need to be filled out in more detail. Perhaps a chart with event types and recommended notification procedures and means can be developed.

Public Notification Policy for Water System Activities

One Village well produces water with iron and manganese concentrations that are above levels which create aesthetic issues. These are common minerals found in central Wisconsin groundwater. The Village treats the well water with a sequestering agent to suspend the minerals in the water, so they are less visible. However, with time and oxidation from the disinfection process, some of the minerals drop out of suspension and coat the interior of the water mains.

A flow disturbance within the water system can stir up the minerals and produced a black (manganese) or reddish (iron) tinted water. If a customer draws water as this cloud of tinted water passes their service it can be noticeable, most often in a large volume such as a bath tub or toilet bowl. Generally the tinted water clears in a short time period. Some areas have experienced tinted water for several days before it clears. In some areas of the distribution system the mineral accumulation is a gritty particle that can be drawn into the customer's faucets/fixtures.

These colored water events can be classified into four (4) types; 1) predictable from regular water distribution system maintenance – such as scheduled flushing, 2) scheduled construction activities – such as main extensions, 3) and finally, 4) sudden and random events.

For many years the colored water events generally occurred during the annual hard flush of the water distribution system. The customers were notified in mass of the potential colored water events via media stories/paid notices, newsletters, web sites and now social media postings. In the past, construction activities and/or emergency repairs were well managed and careful

flushing of the mains resulted in few concerns. Typically the only notices provided were for periods of service outages. However, as the accumulation of minerals in the mains has increased these construction activities can also producing colored water events. The increasing accumulations are also producing sudden and random events as daily variations in flow direction and velocity can create a colored water disturbance. These events are not predictable as to where or when.

The purpose of this policy is to provide a notification procedure for staff to use when there are scheduled water main activities.

Predictable from regular water distribution system maintenance

The regularly scheduled spring and fall flushing events are established well ahead of the event. Web site notices, newsletter stories and bill stuffers are the typical means to provide notice to the entire customer base, system wide.

Scheduled construction activities

Maintenance and/or construction activities often are not scheduled more than a week to several days ahead of the event. The impact to customers is most often localized and generally involves a period of service outage and a potential for colored water as the system is put back into service, as often the event requires the system to be systematically flushed to remove debris and provide safe water. Not all of these events have resulted in colored or at least not noticeable colored water events. Careful, well controlled low volume flushing reduces the changes for colored water. It seem as though in the areas of the system with the smaller mains, the frequency of issues increases, as even the lower flow volumes have higher velocities and can displace more minerals. While the maintenance or construction activity maybe in a confined area, the colored water that may be produced could drift to a wider area. So the limits of a customer notification are hard to define.

Since the schedules of activities, especially new construction, are very fluid and often very short notice, public notification is more difficult. For events that have an approximate time frame, a website posting and a general mailing can be made to customers, not only those that may be out of service but others within a XX ¼ mile radius that may experience colored water. When an activity has been specifically set, a posting should be made on the website and hand delivered notices, with specific days and times made at least 24 hours in advance to customers directly impacted.

Emergency main repairs

Emergency main repairs that is not predicable. Notice of the event would be posting on the website, Facebook and hand delivered notice of the event in the vicinity of the effected are of the emergency.

Sudden and random events

Sudden and random events such as Fire Department fighting fires, training or drawing water to fill tankers notice of these events will be on web-sit & Facebook. Any Tanker fill will need to be approved before the event occurs.

Memo

To: Dewy, Joanne & Richard

From: Mark

Cc: Fingers

Date: 2016-08-30

Re: **Construction/Repair/Maintenance Activities policies – reference colored water issues -**

For most days throughout the year the water distribution system operates automatically with little impact by others, such as operators, fire department and contractors. The operators will operate valves and hydrants as part of annual good practice maintenance requirements or regulatory mandates. The valve exercising operations generally do not impact the customers. Fire hydrant maintenance also generally does not impact customers.

Fire hydrant flushing, as part of the distribution system maintenance, generally impacts customers with colored water events. These activities occur in a well-defined time frame and public notices are made in advance.

Fire department activities include not only emergencies responses utilizing fire hydrants, but also training activities, equipment testing and/or tanker refills. These events can cause colored water events. Some are emergency activities, while others can be scheduled and if the activity is a potential to produce colored water web site / Facebook postings can be made.

Bulk water sales, via a fire hydrant meter, are common summer time occurrences to existing customers for such things as swimming pool fills and to contractors for boring operations or road building activities. The sales occur at different and varying times and the draws are often done by the customer, not an operator. Draws from hydrants located on small diameter mains are more likely to create a colored water event than draws from hydrants on the larger transmission lines. Pool fills are done from the nearest hydrant, regardless of the main size. Tanker fills can be directed to a specific hydrant, such as on a larger main, to be less likely to create a colored water event.

The emergency repair of water main breaks and service line leaks require valve operations and main flushing to remove potential debris and contaminated waters. In Kronenwetter these repairs are often completed by a contractor and the operators. These repairs may occur on the same day as detected or within a short time afterward as utility locates are completed and as materials, labor and equipment area assembled. Direct notification to the public is usually limited to the immediate area, while broader notices can only be accomplished as web site / Facebook postings.

The construction of new water distribution mains can be a simple as the removal of a plug from a pre-design/pre-constructed stub and has no impact on existing customers, to hot taps, again with little to no impact, to full cut-ins of new fittings requiring the valving off of sections of mains, potential customer outages and the need to flush hydrants after the piping is re-assembled. Sometimes these events can be scheduled to a particle day – usually accurate for only the first day of a project. Many times the schedule is subject to progress and scheduling is a plus or minus days accuracy.

In some communities only operators are allowed to turn valves and flush hydrants. A policy that is inconvenient and in-efficient to both customers and operators. In other communities, contractors, along with construction inspectors representing the community can, with notification to the operators, turn valves and flush hydrants.

Policy for Water Distribution System Activities

1) In an emergency such as water main, water service or fire hydrant break/leak, any person may close a water main valve, curb stop or fire hydrant to prevent personal injury or property damage.

2) Fire department personnel may operate fire hydrants. Scheduled training or testing activities that will flow hydrants should have public notice. The operators should be provided written lists of hydrants used so as to check them after use for such things as proper drain down (during the winter), caps needing new gaskets/chains, additional lubrication or locator flag repairs.

3) Only Village operators are allowed to open and close water main valves and curb stops. Customers and contractors are required to schedule operating times with the Village staff. Other normally scheduled operator activities and/or emergencies take priority and operators will respond when available. Events before or after normal working hours (7:30 AM to 4:00 PM) will be charged after hours costs for call in and/or overtime.

4) Only Village operators are allowed to open and flush fire hydrants for the following;

    a) Flush mains after pipes are cut for repairs or water main extensions.

    b) Fill swimming pools or other such bulk sales.

    c) Fill contractor tankage for bulk sales.

    d) Events before or after normal working hours (7:30 AM to 4:00 PM) will be charged after hours costs for call in and/or overtime.

The above are draft issues and I am not recommending or supporting any at this time – they are listed for discussion purposes.

The above draft policies are different than current Village practices and will require more operator time. Fee schedules may need to be adjusted.

Some communities do not allow any bulk sales at hydrants – most often due to colored water issues but also the operator time demands.

Some communities provide bulk sales (to tanker trucks etc) only at a coin operated fill station – this limits the fill site to a location that will have less colored water event potential (at a treatment site or at a large diameter main with the fill rate does not substantially increase the flow velocity and scouring action in the mains).

MEETING DATE: Sept. 6, 2016	REPORT TO PIC		AGENDA ITEM # 6
PRESENTING COMMITTEE: PIC	**COMMITTEE CONTACT:** Chris Eiden	**STAFF CONTACT:** Duane Gau Director of Public Works	**PREPARED BY:** Duane Gau Director of Public Works

ISSUE:

Discussion and Action: Motor Grader Lease

ISSUE BACKGROUND/PREVIOUS ACTIONS:

The Village's 5 year Motor Grader Lease is up in September 2016. The PW Department solicited proposals from two local Equipment Companies: FABICK Equipment Inc. (CAT), and NORTRAX (John Deere). Their proposals are enclosed.

FABCO's proposal is lower than the competition for several reasons: They are able to retrofit our existing front lift group and snow wing, fenders & scarifer onto the new Motor Grader.

The new Motor Grader Lease will come with a 5 year Complete Warranty allowing the Village to fix our cost for the machine. FABICK is located in Weston and the competition will be moving to Merrill. This would be our 3rd year rental of a Cat Grader which provides the Village excellent service.

Public Works Staff is recommending the Village entire into a new 5 Year Lease Agreement with FABICK Equipment Inc (CAT), however the Village Administrator would like some time to further evaluate our long term capital program and is requesting that the Village Board delay action on this item until September.

RECOMMENDED ACTION:

M/C recommend to the Village board to authorize Village Administrator to entire into a new 5 Year Lease Agreement with FABICK Equipment Inc (CAT) ***OR*** recommend to Village board to Purchase New 2016 Cat grader with a 5yr./1500 hours warranty for amount of ***$264,000*** and use the Village Equipment Replacement Fund.

ITEMIZE ALL ANTICIPATED *COSTS* (Direct or Indirect, Start-Up/One-Time, Capital, Ongoing & Annual, Debt Service, etc.)

FABCO Equipment Inc. - $27,586.00 / yr. (five payments with a Buyback of $155,000).
NORTRAX - $32,740.00 / yr. (Six payments with 2 in 2016 for amount of $65,480 with a Buyback of $150,216)

ITEMIZE ALL ANTICIPATED *BENEFITS* (Subjective, Financial, Operational, Service-related, etc.)

The new lease and complete warranty fix the Village's costs for this piece of equipment over the next 5 years.

FUNDING SOURCE(s) – Include Account Number/Description/Budgeted Amt CFY/% Used CFY/$ Remaining CFY

Account Number 100-00-53000- 311-814, Equipment Rental 2016 Budget $25,000

OTHER OPTIONS CONSIDERED:

Option would allow the Village Buy back the current Motor Grader outright after 5 years payment of $85,705 plus buy back payment of ***$160,000*** due September 15, 2016 (total 245,705). The Village will be assuming ALL repair costs for this piece of equipment. For example: the current Motor Grader needs 6 new tires at a cost of approximately $16,000.00 in the next few years and any major repairs. OR an outright purchase of new 2016 CAT grader with a 5yr./1500 hours warranty for amount of ***$264,000*** payment due 2016 (NORTRAX 2016 New John Deer Motor grader for the amount of ***$279,510***)

TIMING REQUIREMENTS/CONSTRAINTS:

The current Motor Grader Lease expires September 15, 2016

ATTACHMENTS (describe briefly):

(1) FABCO Equipment Inc. Quote
(2) NORTRAX Quote
(3) CAT Financial Amortization Schedule – Refinance Current CAT 140H Motor Grader

Finance Proposal

CUSTOMER

Name: KRONENWETTER

Address .....
City .....
State .....
Zip code .....
County .....

Good if:
Acknowledged by Nov-11-16
Funded by Nov-11-16

DEALER

JFTCO, Inc.
Sales person .....
Dealer contact .....
Telephone .....

Quote number 517-6035
Fax number .....
Quote date 08/12/2016
Quote time 14:57:36

FINANCE PROPOSAL

This is Caterpillar Financial Services Corporation's confirmation of the following finance proposal. This is a proposal only and is subject to credit approval, execution of documentation, and execution and approval of the application survey.

Financing type ..... GOVERNMENTAL
Number of payments ..... 5 Annual
Payments ..... in Advance

Quoted by b160eip
Report created by b160eip

	Model	Ann. Hours	Qty	Sale Price	Amount Financed	Payment	Balloon	Fixed Rate
New	12M3	300	1	264,000.00	264,275.00	27,586.00	155,000.00	2.9503

Special Conditions:

12M3
Model Year - 2016, Standard Environment; Major Attachments-Tires, Cab, Air Conditioning; Blades/Buckets/Rippers-Straight Blade

CONDITIONS

Insurance: The customer must provide evidence of physical damage and liability insurance in an amount and from an insurance carrier satisfactory to CFSC. CFSC must be named on the policies, as loss payee and additional insured, as applicable, and a certificate of insurance, in form and substance acceptable to CFSC, must be provided to CFSC.

Taxes: All taxes are the responsibility of the customer and may or may not be included in the above payment amount.

Equipment: The equipment cannot be delivered until all documents are executed by CFSC. All equipment must reside in the United States at all times.

Approval: This proposal is subject to, among other things, final pricing, credit approval and document approval by CFSC.

The terms and conditions outlined herein are not all-inclusive and are based upon information provided to date. This proposal may be withdrawn or modified by Lessor at anytime. This proposal does not represent an offer or commitment by CFSC to enter into a transaction or to provide financing, and does not create any obligation for CFSC. A commitment to enter into the transaction described herein may only be extended by CFSC after this transaction has been approved by all appropriate credit and other authorities within CFSC.

Please indicate your acceptance of this proposal by executing this proposal and returning it to my attention along with the Proposal Fee at the address below. Please be sure to indicate which financing option you have accepted.

Caterpillar Financial Services Corporation
2120 West End Avenue, Nashville, TN 37203
(615)-341-1000

We appreciate the opportunity to provide you a proposal for this transaction.

Proposed by: Acknowledged by:

Caterpillar Financial Services Corporation KRONENWETTER Date

FABICK CAT

www.fabickcat.com

August 15, 2016

Stuart Schmidt
Village Of Kronenwetter
Mosinee, WI 54455-7268

Dear Stuart:

Please review the following specifications below:

(1) Caterpillar 12M3 Motor Grader, 2016 model w/ 0 hours

The following factory and dealer options are included:

* 12m3 Motor Grader
* Moldboard, 14' Plus
* Cutting Edge, 14' Blade
* End Bits, Overlay
* Blade, 14' X 27" X 1"
* Hitch
* Cold Weather Plus Package
* Precleaner, Sy-Klone
* Base+4 (Wm,wt-Float,fl,rip)
* Starter, Elec, Extreme Duty
* Cab, Plus (Anti-Icing Glass)
* Grade Control X Slope
* Snow Arrangement
* Tires, 17.5r25 SnoPlus
* Cab, Premium (Interior)
* Camera, Rear Vision
* Mirrors, Outside Heated
* Guard, Transmission
* Sound Suppression
* Antifreeze Windshield Washer
* Joystick Controls, Advanced
* Lights, Front Headlights, High
* Mounting, Warning Light
* Mount, Snow Wing, Frame Ready
* Lights, Working, Plus
* Transmission, Autoshift
* Fan, Defroster, Rear Window
* Seat, Ventilated + Heated
* Radio Am/Fm/Bluetooth
* Control, Auto Articulation
* LED strobes
* Manuals

* Warranty: Base Warranty is 12 Months/Unlimited Hours with No Mileage, PLUS Premier Extended Service Coverage out to a total of 60 Months or 2000 Hours, whichever comes first, (no deductible).

Milwaukee
11200 West Silver Spring Rd.
Milwaukee, WI 53225-3118
414/461-9100 Tel
414/461-8899 Fax

Power Systems
11200 West Silver Spring Rd.
Milwaukee, WI 53225-3118
414/461-9100 Tel
414/615-2101 Fax

Madison
1111 Applegate Rd.
PO Box 259040
Madison WI 53725-9040
608/271-6200 Tel
608/271-1410 Fax

Eau Claire
7860 Partridge Rd.
PO Box 1088
Eau Claire, WI 54702-1088
715/874-5100 Tel
715/874-5182 Fax

Power Systems
7877 Partridge Rd. (Cty EE)
PO Box 1088
Eau Claire, WI 54702-1088
715/874-5100 Tel
715/874-5151 Fax

LaCrosse
1620 Carol Court
La Crosse, WI 54601-3056
608/783-4691 Tel
608/781-3222 fax

Superior
111 Moccasin Mike Rd.
Superior, WI 54880-4358
715/398-9696 Tel
715/398-9695 Fax

Green Bay
600 Hansen Rd.
PO Box 19976
Green Bay, WI 54307-9176
920/498-8000 Tel
920/499-4844 Fax

Power Systems
2700 South Broadway
PO Box 19976
Green Bay, WI 54307-9176
920/498-8000 Tel
920/499-0890 Fax

Wausau
9601 Christie Ln.
PO Box 350
Schofield, WI 54476-0350
715/359-6220 Tel
715/359-5550 Fax

Marquette
US Highway 41 West
PO Box 638
Marquette, MI 49855-0638
906/475-4191 Tel
906/475-4054 Fax

Net Price Delivered: **$264,000.00**

5 year/1500 hour Guaranteed Buyback: **$155,000.00**

Lease Quote Attached

We believe the equipment as quoted will exceed your expectations. On behalf of Fabick Cat, thank you for the opportunity to quote Caterpillar machinery.

Sincerely,

Roy James
Territory Manager

EXHIBIT 2
Concluding Payment Schedule to
Governmental Agreement

Quote number 517-6035

Dated _____, 20____

between
Caterpillar Financial Services Corporation
and
KRONENWETTER

Description of Unit: 1 Caterpillar 12M3

Date Due	Number of Payments Made	Beginning Balance	Payment Amount	Balloon	Interest 2.95033%	Concluding Payment (*)
Sep-15-16	1	264,275.00	27,586.00	0.00	0.00	236,689.00
Sep-15-17	2	236,689.00	27,586.00	0.00	6,983.11	216,086.11
Sep-15-18	3	216,086.11	27,586.00	0.00	6,375.25	194,875.36
Sep-15-19	4	194,875.36	27,586.00	0.00	5,749.46	173,038.82
Sep-15-20	5	173,038.82	27,586.00	0.00	5,105.22	150,558.04
Sep-15-21	6	150,558.04	0.00	155,000.00	4,441.96	0.00
total			137,930.00	155,000.00	28,655.00	

(*) Does not include any rent payment or other amount then due.

Initialed: _____
(Lessee)

FABICK CAT

JFTCO, INC.

EQUIPMENT PURCHASE ORDER

WISCONSIN

EQPO #:

9601 Christie Lane, Schofield, WI 54476 | Phone: (715) 359-6220 | Fax: (715) 359-5550

By signing this Purchase Order below ("Purchase Order"), the buyer described below ("Buyer") agrees to purchase the equipment described below ("Equipment") from JFTCO, Inc. ("Seller") on the terms and conditions described herein including without limitation the Terms and Conditions of Sale on page 2 of this Equipment Purchase Order.

DATE: **08/18/2016** BUYER #: **016140-000** BUYER PO#: SALESMAN: **Roy James**

BUYER'S NAME: **Village Of Kronenwetter** NAME OF BUYER'S AGENT: **Duane Gau**

ADDRESS 1: ADDRESS 2: **1582 Kronenwetter Dr** COUNTY: **Marathon**

CITY: **Mosinee** STATE: **WI** ZIP: **54455-7268** PHONE: **0** FAX: **NOT ADDED** EMAIL:

SALES CONTACT: **Duane Gau** SUPPORT CONTACT: POINT OF POSESSION:

QTY	UNIT #	MAKE, MODEL, DESCRIPTION	SERIAL NUMBER	CASH PRICE
1	**N.I.S. 088635**	**Caterpillar 12M3 Motor Grader, 2016 model w/ 0 hours, 12m3 Motor Grader, Lane 2 Order, Global Arrangement,low Ambient, Moldboard, 14' Plus, Cutting Edge, 14' Blade, End Bits, Overlay, Blade, 14' X 27" X 1", Cold Weather Plus Package, Lines,standard W/O Accumulator, Precleaner, Sy-Klone, Base+4 (Wm,wt-Float,fl,rip), Starter, Elec, Extreme Duty, Cab, Plus (Anti-Icing Glass), Product Link, Cellular Ple641, Grade Control X Slope, Language, English, Snow Arrangement, Tires, 17.5r25 Mx Xsno+ 1* Mp, Cab, Premium (Interior), Camera, Rear Vision, Mirrors, Outside Heated, Guard, Transmission, Sound Suppression (Bottom), Heater, Engine Coolant, 120v, Mounting, Front Lift, Guard Gp, Hitch, Roll On-Roll Off, Antifreeze Windshield Washer, Lines, Ripper, Additional, Lights, Service, Internal, Seat Belt, Decals, English transfer Wing, Front Lift group, Fenders, and scarifier from Existing grader.** **5year/1500 hour guaranteed buyback at $155,000.00**	**5VNGT**	**$264,000.00**
FINANCIAL ARRANGEMENTS:		**Terms of transaction: CAT Finance 5 year/1500 hour Lease with annual payments** **[ ] Cash** **[ ] Net on Invoice** **[ ] Net 10 Days**	**TOTAL CASH PRICE**	**$264,000.00**

If Buyer is trading in equipment in connection with the purchase of Equipment, Buyer hereby bargains, sells, transfers, conveys and delivers to Seller the trade-in equipment described below (the "Trade-In Equipment") in exchange for the consideration described herein. By signing below, Buyer represents and warrants to Seller that the Trade-In Equipment is free and clear of liens, debts, mortgages, encumbrances and other security interests. Buyer assumes all risk of loss and damage to the Trade-in Equipment until delivery to Seller at Seller's premises.

YEAR	MFGR	MODEL	SERIAL NUMBER	TRADE ALLOWANCE

I. Total Trade Allowance	**$0.00**
II. Less Amount Owed To:	**$0.00**
III. Net Trade Allowance (I-II)	**$0.00**
IV. Other (Specify)	
V. Trade Down Payment (Transfer $ to item 3 at right)	**$0.00**

1. CASH DOWN PAYMENT	**$0.00**
2. TOTAL RENT AMOUNT } **$0.00** LESS CHARGES } **$0.00** =	**$0.00**
3. TRADE DOWN PAYMENT (item V at left)	**$0.00**
4. TOTAL DOWN PAYMENT	**$0.00**
5. UNPAID CASH PRICE	**$264,000.00**
6. TAXES - STATE: **0.0000%** COUNTY: **0.0000%**	**$0.00**
7. CASH DUE ON DELIVERY (5+6)	**$264,000.00**

Unless otherwise provided herein, Buyer shall pay Seller the purchase price for Equipment specified on line 7 above (the 'Purchase Price') on or prior to Seller's delivery of Equipment. If Buyer requests and qualifies, Seller may agree to finance the Purchase Price subject to the terms of Seller's current credit policies and the terms of the JFTCO, Inc. Accounts Receivable System Agreement, which are incorporated into this Contract by reference.

MANUFACTURER'S WARRANTY ON EQUIPMENT, IF ANY

Buyer acknowledges that Seller provides no warranty on Equipment. Please refer to the Terms and Conditions of Sale attached hereto for more detail. Seller will check the appropriate box below.

☒ **NEW -** If this box is checked, a Caterpillar, Inc. warranty, if any, may apply to Equipment.
▶ **Base Warranty is 12 Months/Unlimited Hours with No Mileage, PLUS Premier Extended Service Coverage out to a total of 60 Months or 2000 Hours, whichever comes first, (no deductible), included in price and finance example.**

WARRANTIE(S) PROVIDED BY THE SELLER ON NEW PRODUCTS SHALL BE GIVEN TO PURCHASER UNDER SEPARATE AGREEMENT, THE RECEIPT WHEREOF IS HEREBY ACKNOWLEDGED BY PURCHASER.

☐ **NEW -** Warranty provided by other manufacturer.

☐ **USED -** IF THIS BOX IS CHECKED, BUYER ACKNOWLEDGES THAT EQUIPMENT IS USED AND SOLD "AS IS" WITH NO REPRESENTATIONS OR WARRANTIES, UNLESS OTHERWISE SPECIFIED IN WRITING BELOW ON THIS PURCHASE ORDER.

▶

ACKNOWLEDGEMENT X ______________________
Buyer & Salesperson's Initials

Accepted and Agreed:	Accepted and Agreed:
JFTCO, Inc.	**BUYER OR BUYER'S AGENT**
By X ______________ Date ______ Authorized Signature	By X ______________ Date ______ Authorized Signature
Print Name & Title **Roy James** **Territory Manager**	Print Name & Title **Duane Gau**

4-11-11 REINHART 6-2015

TERMS AND CONDITIONS OF SALE

1. CONTROLLING PROVISIONS. These Terms and Conditions of Sale together with the Purchase Order to which it is attached (the "Contract") constitute an offer by Seller to sell Equipment to Buyer. All capitalized terms not otherwise defined herein shall have the meanings assigned to them in the Purchase Order. Buyer's acceptance of this offer is limited to the terms contained in this offer. Unless otherwise agreed in writing, Seller objects to and rejects any additional, different or varying terms proposed by Buyer, and Seller's offer shall be deemed accepted without such additional, different or varying terms. BUYER'S ORDER WILL BE ACCEPTED ONLY ON THE TERMS AND CONDITIONS CONTAINED HEREIN. If this document is deemed an acceptance of a prior offer by Buyer, such acceptance is limited to the terms of this Contract. This Contract is intended by Seller and Buyer to be the complete, exclusive, and final statement of their agreement. Any changes to this Contract must be in writing and signed by Seller and Buyer.

2. RISK OF LOSS; SHIPMENT. Seller shall deliver Equipment F.O.B. place of shipment (the "Facility"); and all risk of loss, damage or delay, and title to Equipment shall pass from Seller to Buyer upon Seller's delivery of Equipment to the Facility. All delivery dates are approximate. Delivery dates given by Seller are based on prompt receipt of all necessary information regarding the order. Unless otherwise stated in this Contract, Seller will use reasonable efforts to meet such delivery dates, but does not guarantee to meet such dates. Seller's failure to meet any delivery date does not constitute a cause for cancellation and/or for damages of any kind. Time for delivery shall not be of the essence.

3. DELIVERY DELAYS. Seller is excused from performance if performance is rendered impracticable by any accident; war or terrorism; delay, interruption in or failure of sources or subcontractors to supply materials and equipment; labor or transportation problem; flood, fire, earthquake or other act of God; or other causes and conditions that are beyond Seller's reasonable control; or any governmental orders, contracts, priorities, directives, requisitions or requests, whether or not voluntarily assumed. In the event of any such occurrence, Seller may, at its option and without incurring liability, prorate its deliveries, cancel all or any portion of the Contract and/or extend any date upon which performance is due hereunder.

4. CLAIMS, CANCELLATIONS AND RETURNS. Any claims by Buyer for breach of contract by Seller must be brought within one year of the act or omission on which the claim is based. Claims for errors in Equipment delivered must be made in writing to Seller within ten days after delivery. Failure to give such notice shall constitute Buyer's unqualified acceptance and waiver of all such claims. All undelivered Equipment may be cancelled by Buyer only upon written approval of Seller's authorized representative. In the event of any cancellation of an order by Buyer, Buyer shall pay Seller's reasonable costs and expenses. Buyer shall not alter or modify Buyer's order or any part thereof without Seller's prior written consent. Seller reserves the right to change the price, terms of payment and delivery dates for any Equipment affected by any alterations or modification to which Seller consents. No Equipment may be returned to Seller without Seller's prior written authorization and Equipment may be returned only on the terms or conditions specified in such authorization. Returned Equipment must be of current manufacture, unused, in resalable condition, and securely packed to reach Seller without damage. Any cost incurred by Seller to put Equipment in first class condition will be charged to Buyer.

5. PRICES; PAYMENT TERMS. The Purchase Price for Equipment shall be as stated on the Purchase Order. Unless otherwise stated in this Contract, the Purchase Price is in U.S. Dollars, F.O.B. the Facility. Written quotations from Seller are void unless accepted within 30 days from date of issue. Seller's other publications are maintained as sources of general information and are not quotations or offers to sell. Unless otherwise stated in this Contract, payment terms are 100% of the Purchase Price due upon delivery. Notwithstanding the foregoing, terms of payment on all orders are subject to the prior written approval of Seller's credit department. If Buyer does not pay Seller any amount due under this Contract or any other agreement when such amount is due or if Buyer defaults in the performance of this Contract, Seller may, without liability to Buyer and without prejudice to Seller's other lawful remedies (i) terminate Seller's obligations under this Contract; (ii) declare immediately due and payable all of Buyer's obligations to Seller; (iii) change credit terms with respect to any further Equipment; (iv) suspend or discontinue any further Equipment; and/or (v) repossess Equipment. Buyer agrees to reimburse Seller for all costs and fees including attorneys' fees and repossession fees, incurred by Seller in collecting any sums owed by Buyer to Seller. Buyer agrees to pay a late payment charge equal to the lesser of 2% per month, or the maximum amount allowable by law, on all amounts not paid in full when due, payable on Seller's demand. Buyer shall not set off amounts due to Seller against Buyer's claims against Seller.

6. TAXES; PERMITS. Unless otherwise specified on the Purchase Order, prices do not include any manufacturer's, sales, use or excise taxes, or other taxes, charges or duties. Buyer will pay or reimburse Seller on demand for all such taxes, charges and duties. The Purchase Price does not include the cost of any permits which may be necessary to use or operate Equipment, and Buyer is solely responsible for obtaining and paying all costs related to such permits.

7. SECURITY INTEREST. In partial consideration for Seller's sale of Equipment to Buyer, Buyer grants to Seller and Seller retains a security interest in Equipment sold to Buyer to secure all of Buyer's obligations to Seller under this Contract and all other obligations of Seller to Buyer. Buyer agrees to execute such financing statements, continuation statements and other documents including pledge agreements, and to take such actions as may be required by Seller to evidence or perfect the security interest granted herein and Seller's interest. Seller is authorized in Buyer's name or otherwise to take such actions as permitted under this Contract or applicable law, including signing Buyer's name, and Buyer appoints Seller as Buyer's attorney-in-fact for such purpose.

8. INDEMNITY. BUYER RELEASES AND AGREES TO INDEMNIFY AND HOLD HARMLESS SELLER AND SELLER'S SHAREHOLDERS, OFFICERS, DIRECTORS, AGENTS, EMPLOYEES, AFFILIATES, SUCCESSORS, ASSIGNS AND THIRD PARTY SUPPLIERS ("SELLER'S INDEMNIFIED PARTIES") FROM AND AGAINST ANY AND ALL DIRECT AND INDIRECT CLAIMS, DEBTS, ACTIONS, CAUSES OF ACTION, SUITS, DEMANDS, FINES, PENALTIES, JUDGMENTS, OMISSIONS, DAMAGES OR EXPENSES WHATSOEVER, INCLUDING ACTUAL ATTORNEYS' FEES AND COSTS, ARISING OUT OF OR RELATING TO: (A) BREACH BY BUYER OF ANY REPRESENTATION, WARRANTY, COVENANT OR TERM CONTAINED IN THIS CONTRACT OR ANY LAW; (B) ANY DAMAGE TO OR DESTRUCTION OF PROPERTY, OR INJURY TO OR DEATH OF PERSONS CAUSED OR ALLEGED TO HAVE BEEN CAUSED IN WHOLE OR IN PART, BY ANY INTENTIONAL, RECKLESS, NEGLIGENT OR OTHER ACT (OR FAILURE TO ACT) BY BUYER OR BUYER'S SHAREHOLDERS, OFFICERS, DIRECTORS, SUBCONTRACTORS, AGENTS, EMPLOYEES, AFFILIATES OR SUCCESSORS ("BUYER'S AGENTS"); OR (C) LOSSES, DAMAGES OR INJURIES CAUSED BY BUYER'S EQUIPMENT OR DUE TO IMPROPER APPLICATION OR USE OF EQUIPMENT BY BUYER OR BUYER'S AGENTS.

9. NO WARRANTY; LIMITATION OF LIABILITY; DISCLAIMER OF WARRANTIES. UNLESS OTHERWISE PROVIDED IN THIS CONTRACT, SELLER MAKES NO WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO EQUIPMENT, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SELLER HEREBY DISCLAIMS AND EXCLUDES ALL EXPRESS AND IMPLIED WARRANTIES. Some states do not allow the exclusion or limitation of incidental and consequential damages, so the above limitation or exclusion may not apply to Buyer. This warranty gives Buyer specific legal rights, and Buyer may also have other rights which vary from state to state. Any oral or written description of Equipment is for the sole purpose of identifying Equipment and shall not be construed as an express warranty. Prior to using or permitting use of Equipment, Buyer shall determine the suitability of Equipment for the intended use. Buyer shall assume all risk and liability whatsoever in connection therewith. **IN ORDER TO MAINTAIN SELLER'S PRICING, SELLER'S AGGREGATE LIABILITY WITH RESPECT TO THIS AGREEMENT SHALL BE LIMITED TO THE AMOUNT OF MONEY PAID TO SELLER BY BUYER FOR EQUIPMENT. IN NO EVENT SHALL SELLER BE LIABLE FOR INCIDENTAL, SPECIAL, CONSEQUENTIAL, PUNITIVE, OR OTHER INDIRECT DAMAGES OR LOST PROFITS.**

10. ASSIGNMENT. Buyer shall not assign this Contract without Seller's prior written consent. Seller may assign the Contract in whole or in part in connection with Seller's merger, to a purchaser of substantially all of Seller's assets or to any of Seller's affiliates. Subject to the foregoing, the Contract shall inure to the benefit of, and be binding upon, the parties' successors and assigns.

11. SURVIVAL. Sections 1, 5, 6, 8, 9 and 12 and any other provision the performance or effectiveness of which naturally survives, shall survive expiration or termination of the parties' agreement for any reason. Seller's remedies herein are cumulative and not exclusive of any other remedies available to Seller at law, by contract or in equity.

12. GOVERNING LAW. This Contract shall be governed by and construed according to the internal laws of the State of Wisconsin, including the Uniform Commercial Code - Sales (Chapter 402 of the Wisconsin Statutes). This Contract shall not be governed by the provisions of the United Nations Convention on Contracts for the International Sale of Goods. Any cause of action, claim, suit or demand by Buyer allegedly arising from or related to the terms of this Contract or the relationship of the parties shall be brought in a court situated in Milwaukee, Wisconsin. Both parties irrevocably admit themselves to and consent to the venue and jurisdiction of said Court.

13. SEVERABILITY; WAIVER. The invalidity of any provision or clause of this Contract shall not affect the validity of any other provision or clause hereof. Seller reserves the right to correct clerical or similar errors relating to price or any other term shown in this Contract. The failure of either party to insist, in any one or more instances, upon performance of any term, covenant or condition of this Contract shall not be construed as a waiver or relinquishment or any right granted hereunder or the future performance of such term, covenant or condition.

14. COMPLIANCE WITH LAWS. Buyer agrees to comply with all laws and regulations applicable to the purchase, transport, use, storage, sale, lease and/or disposal of Equipment including to the extent applicable, the U.S. Export Administration Act and all regulations thereunder.

15. NOTICES. Any notice required to be given to Seller shall be sent by registered or certified mail, return receipt requested, to the Branch Supervisor at the address stated in this Contract.

16. SETOFF. Seller may set off any amount due from Buyer, whether or not under this Contract, against any amount that may become due to Buyer hereunder.

17. COUNTERPARTS; OTHER. This Contract may be executed by facsimile signatures and in counterparts, each of which shall be deemed an original instrument. The individual signing this Contract is authorized to sign this Contract on Buyer's behalf. **IF BUYER WISHES TO NEGOTIATE ANY ONE OR MORE DIFFERENT TERMS THAN THOSE CONTAINED IN THESE TERMS AND CONDITIONS OF SALE, INCLUDING HIGHER LIABILITY LIMITS, BUYER MAY DO SO.** However, any such change to this Contract must be in writing and signed by Seller's and Buyer's authorized representatives.

18. In the event this machine is equipped with Product Link, Buyer understands data concerning this machine, its condition, and its operation is being transmitted by Product Link to Caterpillar and/or its dealers to better serve Buyer and to improve upon Caterpillar products and services. The information transmitted may include: machine serial number, machine location, and operational data, including but not limited to: fault codes, emissions data, fuel usage, service meter hours, software and hardware version numbers, and installed attachments. Caterpillar will not sell or rent collected information to any other third party and will exercise reasonable efforts to keep the information secure. Caterpillar Inc. recognizes and respects Buyer privacy. Buyer agrees to allow this data to be accessed by Caterpillar and/or its dealers.

Buyer's Initials _____

BILL OF SALE FOR PROPERTY TAKEN IN TRADE

For value received, I/we hereby grant, sell, transfer and deliver unto **JFTCO, Inc. D/B/A Fabick Cat**

9601 Christie Lane **Schofield** **WI** **54476**

I/we hereby certify that there is no lien, claim, debt, mortgage or encumbrance of any kind, nature or description against this property now existing, of record or otherwise, and that same is free and clear and is my/our sole and absolute property. I/we agree to assume all risk of loss and/or damage to above described equipment, beyond normal wear, until delivery is promptly effected.

_____

by _____

(Title)

JOHN DEERE

NORTRAX

Nortrax Inc.
1425 O'Keefe Drive
Mosinee, WI 54455

Tom Fox
715-295-4657 cell

August 17, 2016

Village of Kronenwetter
JD 770G motor grader

	Event	Date	Amount	Number	Period	End Date
1	Lease	8/16/2016	279,510.00	1		
2	Lease Payment	8/16/2016	32,740.00	5	Annual	8/16/2020
3	Residual	8/16/2021	150,216.00	1		

AMORTIZATION SCHEDULE - Normal Amortization

	Date	Lease Payment	Residual	Interest	Principal	Balance
Lease	8/16/2016					279,510.00
1	8/16/2016	32,740.00		0.00	32,740.00	246,770.00
2016 Totals		32,740.00	0.00	0.00	32,740.00	
2	8/16/2017	32,740.00		8,627.17	24,112.83	222,657.17
2017 Totals		32,740.00	0.00	8,627.17	24,112.83	
3	8/16/2018	32,740.00		7,784.17	24,955.83	197,701.34
2018 Totals		32,740.00	0.00	7,784.17	24,955.83	
4	8/16/2019	32,740.00		6,911.71	25,828.29	171,873.05
2019 Totals		32,740.00	0.00	6,911.71	25,828.29	
5	8/16/2020	32,740.00		6,008.74	26,731.26	145,141.79
2020 Totals		32,740.00	0.00	6,008.74	26,731.26	
Residual	8/16/2021		150,216.00	5,074.21	145,141.79	0.00
2021 Totals		0.00	150,216.00	5,074.21	145,141.79	
Grand Totals		163,700.00	150,216.00	34,406.00	279,510.00	

Selling Equipment

Quote Id: 13877980

JOHN DEERE 770G MOTOR GRADER

Hours:
Stock Number:

Code	Description	Qty
8460T	770G MOTOR GRADER	1
	Standard Options - Per Unit	
1020	770GP with Grade Pro Controls	1
1140	John Deere PowerTech PSS 9.0L meets EPA FT4 Emissions (255 Net Peak hp)	1
1240	200 amp Alternator	1
1320	No Quick Service Group	1
1410	Standard Fuel & Water Filtration	1
1610	Hydraulic Pump Disconnect	1
1710	JDLink Ultimate Cellular for the Americas, excluding Costa Rica - 5 Years	1
1840	Engine Exhaust with Chrome Stack for 9.0L (EPA FT4 only)	1
1920	No Blade Impact Absorption System	1
2060	14 Ft. x 24 In. x 7/8 In. (4.27 M x 610 mm x 22 mm) with 8 In. x 3/4 In. (203 x 19 mm) Cutting Edge and 5/8 in. (16mm) Hardware	1
2575	No Grade Control Base Kit Installed	1
2605	English Labels and Decals	1
2775	No Topcon Radio Installation	1
2820	Single Input Gearbox with Slip Clutch	1
4631	Michelin SnoPlus	1
5060	Grade Pro Low Cab w/ Lower Front and Side Opening Windows	1
5510	Autoshift Transmission	1
5710	Transmission Solenoid Valve Guard	1
5815	Hydrau	1
6010	Powered Cab Air Precleaner	1
6140	Grade Pro Premium Heated, Leather/ Fabric, High-Wide Back Air Suspension Seat	1
6590	Grade Pro Controls w/1 Front Auxiliary Function and 3 Rear Auxiliary Functions with Right and Left hand Controllers and 2 Miniature Multi Axis Joysticks	1

Selling Equipment

Quote Id: 13877980

6650	Grade Pro Controls - Left Side	1
6750	Less Front Attachment	1
6830	Rear Hitch and Pin	1
7180	Premium Grading Lights (18 LED Lights)	1
7810	Front Fenders	1
8120	24-to-12 Volt Converter (30 amps peak / 25 amps continuous)	1
8220	Heated Exterior Mounted Rearview Mirrors	1
8310	Lower Front Intermittent Wiper & Washer	1
8415	Premium AM/FM Radio with Bluetooth, Aux, Weather Band (WB), and XM Ready	1
8510	Air Conditioner Refrigerant Charged	1
8730	No Sound Absorption Package	1
8810	Rear Camera	1
9005	Rear Wheel Fenders	1
9120	Front Window Movable Sun Visor	1
9130	Rear Retractable Sun Shade	1
9210	Decelerator	1
9220	5.0 lbs. multi purpose (ABC) Dry Chemical Fire Extinguisher	1
9270	Tall (26in.(660mm) higher than Standard Frame Lights) Front Snow Plow Light Bar	1
9290	Flip Down Cab Beacon Bracket (RH)	1
9360	Engine Block Heater	1
	Other Charges	
	Freight	1

FABCO CAT

9601 Christie Lane, Wausau, WI 54476 | Phone: (715) 359-6220 | Fax: (715) 359-5550

EQUIPMENT PURCHASE ORDER

EQPO #: **RSP143**

PURCHASER'S COPY

DATE: June 5 2006 | CUST #: 16140 | SSN or FED ID #: | SALESMAN: Ronald A. Siclovan

BUYER'S NAME: Ms. Lisa Myles | COMPANY: Village Of Kronenwetter

ADDRESS 1: | ADDRESS 2: 1582 Kronenwetter Dr | COUNTY: Marathon

CITY: Mosinee | STATE: WI | ZIP: 54455-8471 | PHONE: (715) 359-3248 | FAX: (|1|) -2|-

SALES CONTACT: | SUPPORT CONTACT: | POINT OF POSESSION:

QTY	UNIT #	MAKE, MODEL, DESCRIPTION	SERIAL NUMBER	CASH PRICE
1	43016	Caterpillar 140H Motor Grader , 2006 model w/4 hours, lights, cab and bar mounted, snow arrangement, a/c, guard, lower platform, guard, brake lines, seat, cloth,contour air, wiper/washer, rear, lp, radio ready, entertainment, converter, communication, power port, 12v accessory, lp, covers, louver w/screen, mount, snow wing, frame ready, hydraulics, base & 4 functions, lines, plow/dozer lift-right, lines, ripper, rear, blade, 14' x 27" x 1", bracket, scarifier, tires, 17.5r25 mx xha 1* sp, coolant, ext. life, -50c(-58f), roll on-roll off, cert emmisions, epa, engine, target tech strobe /whelen L.E.D.lights, sno plus tires in place of xha tires.	CCA02586	$210,721.00
			TOTAL CASH PRICE	$210,721.00

FINANCIAL ARRANGEMENTS: This is a conditional sales contract. Finance balance with Caterpillar Financial Services Corp., on approval, for60 month lease with annual payments of 15,025.00 per year(1st due Jan 07)and a purchase option of 120,000.00 Other terms: A Financial Statement is required on all financing agreements.

Purchaser hereby bargains, sells and conveys unto Seller the below described Trade-In Equipment and warrants and certifies it to be free and clear of liens, encumbrance, and security interests except to the extent shown below.

YEAR	MFGR	MODEL	SERIAL NUMBER	TRADE ALLOWANCE
2001	Caterpillar	140H		$155,000.00

I. Total Trade Allowance	$155,000.00
II. Less Amount Owed To:	$105,722.00
III. Net Trade Allowance (I-II)	$49,278.00
IV. Other (Specify)	
V. Trade Down Payment (Transfer $ to item 3 at right)	$49,278.00

1. CASH DOWN PAYMENT	$0.00
2. RENT APPLIED	
3. TRADE DOWN PAYMENT (item V at left)	$49,278.00
4. TOTAL DOWN PAYMENT	$49,278.00
5. UNPAID CASH PRICE	$161,443.00
6. TAXES - STATE: 0.000% COUNTY:	$0.00
7. CASH DUE ON DELIVERY (5+6)	$161,443.00

This is a cash transaction. If the Purchaser so requests prior to acceptance, the Cash Due on Delivery may be financed as a time sale transaction, subject to credit approval. If this transaction becomes a time sale, Purchaser agrees (1) to make payments pursuant to the FABCO Equipment Inc. Accounts Receivable System Agreement, which is incorporated into this Equipment Purchaser's Order by reference, and (2) that seller retains security interest in the goods described herein until all obligations of Purchaser are paid in full and discharged.

WARRANTY ON EQUIPMENT EXTENDED BY SELLER

Warranty coverage on the equipment covered by this order, if any, has been explained to Purchaser. The warranty coverage is outlined below and indicated by the box checked hereon.

☒ **NEW -** Caterpillar Warranty subject to qualification. If qualified, the following terms apply only if box at left is checked:

▶ **Base Warranty is 12 Months/1,500 Hours with No mileage, PLUS Total PLUS Extended Service Coverage out to a total of 60 Months or 5,000 Hours, whichever comes first, (No deductible), included in price and finance example.**

WARRANTIE(S) PROVIDED BY THE SELLER ON NEW PRODUCTS SHALL BE GIVEN TO PURCHASER UNDER SEPARATE AGREEMENT, THE RECEIPT WHEREOF IS HEREBY ACKNOWLEDGED BY PURCHASER.

☐ **NEW -** Warranty provided by other manufacturer.

☐ **USED -** When the equipment covered by this order is used equipment, THE PURCHASER STATES THAT HE HAS EXAMINED THE EQUIPMENT and is buying the equipment AS IS and with NO REPRESENTATIONS OR WARRANTIES, unless otherwise specified in writing below:

▶

ACKNOWLEDGEMENT X _____ Purchaser & Salesman's Initials

REQUIRED ACCEPTANCE AND METHOD OF MODIFICATION: This order must be accepted by the signing of this order and initialing modifications, if any, by Seller's Sales Manager or Used Equipment Manager who shall be the only agent authorized to do so, before it shall be binding on Seller. No present nor subsequent modifications of this purchase order shall be effective unless written hereon or contained in a separate writing accepted as required herein. OTHER STATEMENTS OR ACTION BY SALESMEN OR OTHERS SHALL NOT BE VALID UNLESS AND UNTIL SO WRITTEN AND ACCEPTED AS REQUIRED. NOTICE TO THE PURCHASER: THIS ORDER IS SUBJECT TO THE TERMS AND CONDITIONS ON THE REVERSE SIDE HEREOF AND THE APPLICABLE STATEMENT OF WARRANTY ATTACHED HERETO, WHICH SHOULD BE READ CAREFULLY AND COMPLETELY BEFORE SIGNING. DO NOT SIGN THIS CONTRACT BEFORE YOU READ IT OR IF IT CONTAINS BLANK SPACES. BY HIS SIGNATURE, PURCHASER ACKNOWLEDGES RECEIPT OF A COPY OF THIS CONTRACT AND WARRANTIES ATTACHED HERETO.

By _____ Date _____
Authorized Signature

Title _____

Salesman: Ron Siclovan

By Lisa Myles Date 06-14-06

Signed X Lisa Myles

Title PWD

FABCO Equipment Inc. | Purchaser

EXHIBIT 2 (multiple assets)
Concluding Payment Schedule to
Governmental Agreement

Dated 9/15, 20 06

between
Caterpillar Financial Services Corporation
and
TOWN OF KRONENWETTER, WI

Description of Unit: 1 Caterpillar 140H CCA(RIP) serial # CCA02586

Date	Number of Payments Made	Beginning Balance	Payment Amount	Interest 5.35016%	Concluding Payment (*)
Jul-01-06	0	160,984.19	0.00	0.00	160,984.19
Jan-01-07	1	160,984.19	15,025.00	4,306.46	150,265.65
Jan-01-08	2	150,265.65	15,025.00	8,039.46	143,280.11
Jun-01-09	3	143,280.11	15,025.00	7,665.72	135,920.83
Jan-01-10	4	135,920.83	15,025.00	7,271.99	128,167.82
Jan-01-11	5	128,167.82	135,025.00	6,857.18	0.00
TOTAL			195,125.00	34,140.81	

(*) Does not include any rent payment or other amount then due.

Initialed: _____
(Lessee)

ATTACHMENT D

PAYMENT SCHEDULE

To Governmental Equipment Lease-Purchase Agreement Transaction Number 1871391

between

VILLAGE OF KRONENWETTER, WI

and

Caterpillar Financial Services Corporation

Payment Dates	Payment Numbers	Payment Amounts Due
Advance - 9-15-11	1	$15,025.00
9-15-12, 9-15-13, 9-15-14, 9-15-15	2-5	$17,670.00
~~9-15-15~~, 9-15-16 →	FINAL PAYMENT OF	$160,000.00

VILLAGE OF KRONENWETTER, WI
(Lessee)

Signature

Name (PRINT) SEAN VON BERGEN

Title DIRECTOR OF PUBLIC WORKS

Date 9.12.2011

Caterpillar Financial Services Corporation
(Lessor)

Signature

Name (PRINT) Nicholas A. Young

Title Nicholas A. Young / Documentation Manager

Date SEP 21 2011

MEETING DATE: Sept. 6, 2016	REPORT TO PIC	AGENDA ITEM # 7

PRESENTING COMMITTEE:	COMMITTEE CONTACT:	STAFF CONTACT:	PREPARED BY:
PIC	Chris Eiden	Duane Gau, DPW	Duane Gau, DPW

ISSUE: Discussion & Recommendation Proposals for Well No. 2 Pilot Study

ISSUE BACKGROUND/PREVIOUS ACTIONS

In the spring of 2005 a customer with an inline sediment filter noted his filters were rapidly turning dark brown. Also in 2005, while flushing a hydrant on Joy Lane to address a water taste/quality complaint, the increased flow produced brown water at several adjacent dwellings. Also in the spring, a customer filling a swimming pool, via a hydrant, experienced a pool full of colored water. Testing raw water samples from each well revealed a dramatic increase in manganese levels at Well No. 2, from the tests obtained several years prior. The levels approached 1 ppm. During that year the levels stayed elevated. In the fall of 2005 the Village Board elected to proceed with the addition of a sequestering agent. Plans were submitted to the DNR and in December the feed equipment was approved for use. In January 2006 the Village began adding a polyphosphate to aid in the suspension of manganese in the water. In 2010 the pumping equipment at Well No. 2 was pulled for inspection and repair. The well was inspected with a camera. Prior to returning the well online, the screen was wire brushed, surged with air and a mild chemical treatment was performed. In 2013 the Village retained AECOM to further test and evaluate Well #2 and the manganese issues because of customer complaints of colored water. Within the AECOM report one of the recommendations was to uni-directional flush the water system and to consider a filtering system in the future to control the rise in manganese. In 2015 the Village started the uni-directional flushing. This year we have several additional customer complaints related to colored water during uni-directional flushing or disruption of the water system.

When Well # 2 was constructed in 1996, the concentrations of iron & manganese were very low. The concentrations of iron and manganese at Well # 2 currently exceed the secondary drinking water standards. The iron concentration has increased to approximately 0.55mg/l recently, while manganese has remained relatively constant at about 0.25 mg/l since 2005.

The Village has sent out a request for proposals (RFP) for professional engineers to conduct a Pilot Study of Well # 2 to determine the design process to filter Well # 2 water to reduce the secondary drinking water standards of iron & manganese.

The Village received four proposals and village staff reviewed and ranked them. The staff ranked the consultants in this order, BHA, AECOM, MSA and Strand.

PIC members are to review the proposal and rate them and their scores will be tallied to come up their preferred consultant to recommend to the Village Board.

RECOMMENDED ACTION:

Recommend to the Village board to award contract to _____ Engineers to perform the services of a Pilot Study at Well No. 2 to obtain the most cost effective process to reduce iron and manganese levels

COST/BENEFIT ANALYSIS and JUSTIFICATION

(attach separate spreadsheets or other documentation as applicable)

ITEMIZE ALL ANTICIPATED *COSTS* (Direct or Indirect, Start-Up/One-Time, Capital, Ongoing & Annual, Debt Service, etc.)

Cost of this service is in the 2016 Water Utility budget

ITEMIZE ALL ANTICIPATED *BENEFITS* (Subjective, Financial, Operational, Service-related, etc.)

Improve Well #2 water quality.

FUNDING SOURCE(s) – Must include Account Number/Description/Budgeted Amt CFY/% Used CFY

Water Utility Enterprise fund Acct. #601-00-53600-923-002 Engineering Services

OTHER OPTIONS CONSIDERED: Do nothing

TIMING REQUIREMENTS/CONSTRAINTS: Complete project by end of the year

ATTACHMENTS (describe briefly): Proposals (***HARD COPY ON DUANE'S DESK***), Staff ranking & PIC ranking sheets

Firm	Firm's History (0-5)	Firm's ability and expertise (0-10)	Firm's understanding an approach on this project (0-30)	Firm's assigned personnel (0-30)	Firm's related project experience and qualifications (0-25)	Total Points (100 Total)	Staff Ranking	RD	DG	MT	Rating	Fee 2 Week Pilot Program
AECOM								2	2	2	6	$ 27,950.00
BHA								1	3	1	5*	$ 28,500.00
MSA								3	1	4	8	$ 24,680.00
Strand								4	4	3	11	$ 31,400.00
											* Staff Perfered Consulant	

Firm	PIC Member One	PIC Member Two	PIC Member Three	PIC Member Four	PIC Members Scoring	PIC Ranking	Staff Raking
AECOM Stevens Point							**2**
BHA Wausau							**`1**
MSA Marshfield							**3**
Strand Madison							**4**

Submitted to:
Village of Kronenwetter Water Utility
August 24, 2016

AECOM

Well 2 Pilot Study

Proposal for Professional Engineering Services

AECOM
200 Indiana Avenue
Stevens Point, WI 54481
www.aecom.com

715 341 8110 tel
715 341 7390 fax

August 24, 2016

Village of Kronenwetter
Mark W. Thompson
1582 Kronenwetter Drive
Kronenwetter, WI 54455

Subject: Well 2 Pilot Study
Village of Kronenwetter
AECOM Proposal

Dear Mr. Thompson:

The Village of Kronenwetter is looking for assistance with a Pilot Study for municipal Well 2 in the Village of Kronenwetter. AECOM has a local project team specializing in water supply and treatment including pilot treatment studies. Our firm offers the following benefits to the Kronenwetter Water Utility:

- Proven, successful water treatment and pilot study team.
- Local experts to provide daily support.
- Is sensitive to public perception of water quality issues.
- Good working relationship with the Wisconsin Department of Natural Resources and a good understanding of Wisconsin requirements for approval of water treatment projects.
- Has demonstrated successful project management with utilities throughout Wisconsin.
- Will meet the project schedule.

This proposal is being submitted contingent upon the Village and AECOM and its subcontractors agreeing to general terms and conditions of the contract.

We appreciate the opportunity to submit this proposal. We look forward to assisting the Village of Kronenwetter with this important project. Please contact Dennis Saari if you have any questions or need additional information.

Sincerely,

Dennis Saari, PE
Project Manager
715-342-3041
dennis.saari@aecom.com

Tom Degen, PE
Water Department Manager
715-342-3031
tom.degen@aecom.com

CONTENTS

Project Understanding

The Village of Kronenwetter has been receiving water quality complaints that are believed to be due to elevated levels of iron and manganese entering the distribution system from Well 2. AECOM conducted a study of supply and treatment alternatives in 2013 and 2014 and is very familiar with the water quality issues.

The Village wishes to have pilot testing conducted using filtration systems that are expected to meet the Secondary Maximum Contaminant Levels (SMCLs) of 0.3 mg/L iron and 0.05 mg/L manganese.

The Village is planning to construct a third well near well 2 and the new well is expected to have elevated levels of iron and manganese in the water. Consideration for future treatment of Well 3 and possible Well 1 will be considered when providing recommendations on the design of a water treatment system at Well 2.

Project Approach

AECOM will conduct the pilot study in accordance with scope of services outlined in in the RFP. More specifically, AECOM will:

- Review the report we prepared in 2014, and additional water quality data and pumping data available since the report was completed.
- Review available filtration media and oxidizing agents and select appropriate combinations for pilot testing.
- Prepare a pilot testing protocol that will include evaluation of alternative filter media and oxidizing agents, and solicit input from Wisconsin DNR on the pilot testing protocol. Some bench scale testing may be conducted to select the most appropriate equipment for field testing.
- AECOM intends to contract with ATEC Systems for pilot testing equipment. ATEC equipment was used by AECOM for pilot testing in Medford and Madison.
- Coordinate with the Village and pilot testing subcontractor for the logistics of connecting pilot testing equipment to the existing well 2 discharge piping and power from the existing electrical system.
- Develop a sampling protocol that includes a combination of field and laboratory testing. Field testing provides real time data that can be used to make adjustments to the chemical doses or treatment process during the pilot testing. Laboratory testing provides a means of confirming the accuracy of the field testing and provides water quality data for parameters that cannot be readily tested in the field.
- Evaluate settling characteristics of the filter backwash water during pilot testing. The data obtained will be useful in designing backwash settling, and recycling facilities.
- Prepare a report summarizing the pilot testing procedures, findings and recommendations for constructing a treatment system, budgetary costs for the design, regulatory approvals, bidding, construction and operation of the recommended water treatment plant.
- Submit paper and electronic copies of the report as outlined in the RFP.

Pilot testing will be conducted 24 hours per day during the testing period. The following parameters will be evaluated on the source water and filtered water during pilot testing:

- Manganese – every hour
- Iron – every other hour
- pH – every other hour
- Temperature – every other hour
- Free residual chlorine in the product water – every other hour
- Hydrogen sulfides – as needed
- Ammonia – as needed
- Other parameters as mutually agreed

Related Experience

AECOM is well experienced with conducting pilot scale treatment testing. Dennis Saari and Angel Gebeau have been involved with pilot testing for many iron and manganese treatment plants as well as pilot testing for treatment of other contaminants in groundwater. AECOM has a laboratory with bench scale treatment equipment and pilot testing in our Milwaukee office and we may use the facilities and staff to assist in selecting appropriate equipment for pilot testing in the field.

AECOM will subcontract with ATEC Systems Associates for pilot testing equipment. ATEC Systems Associates is a manufacturer of water treatment systems, and has extensive experience with conducting pilot treatment testing. Pilot testing will be conducted at the project site using ATEC's treatment equipment in an enclosed trailer.

Project Team

Our team has successfully sited and developed sustainable supply sources, and worked with the public to alleviate concerns about impacts on private wells and sensitive areas, and development in residential and public owned areas.

Dennis Saari, P.E.
Project Manager

The AECOM project team will be led by Dennis Saari; P.E. Dennis has more than 35 years of experience designing water supply, treatment, and distribution systems throughout Wisconsin. Dennis will manage the pilot testing, attend meetings, present data, and be responsible for meeting your project requirements. Dennis was the project manager for the 2013-2014 water quality study at Kronenwetter Well 2.

Angel Gebeau
Project Engineer

Angel Gebeau will be the project engineer providing the technical expertise in water quality and treatment. Angel has more than 14 years of experience and specializes in drinking water treatment projects. Angel has recent pilot testing experience with projects in Medford and Madison Wisconsin, and Edina and Saint Louis Park Minnesota.

Tom Degen
Quality Control

Tom Degen is the water department manager with water treatment experience, and will be responsible for seeing that the project has the staffing, support and quality control needed for a successful project.

Similar Projects

Pilot Testing

Client: City of Medford

Contact: John Fales

Telephone: 715-748-4321

Key Staff: Dennis Saari
Angel Gebeau

AECOM assisted the City of Medford with developing a pilot testing protocol and selection of a vendor to conduct pilot treatment testing for removal of iron and manganese from a proposed well. For this project the City contracted directly with ATEC Systems, and AECOM assisted with reviewing the equipment installation, testing and sampling procedures and reviewed the results. AECOM then provided recommendations on the treatment system to install and provided probable costs for construction and operation of a water treatment plant for the proposed well. The well and water treatment plant are currently being designed and are expected to be constructed later this year and next year. Dennis Saari was the Project Manager for the pilot testing, and Angel Gebeau was the Project Engineer. The pilot testing was completed in 2013.

Pilot Testing

Client: Minnesota Pollution Control Agency (MPCA)

Contact: Jennifer Jernisek

Telephone: 651-757-2181

Key Staff: Dennis Saari
Angel Gebeau

AECOM assisted the Minnesota Pollution Control Agency (MPCA) with pilot treatment testing for drinking water wells contaminated with organics at existing wells 4 and 6 in Saint Louis Park. Testing was completed using a combination of bench scale testing in AECOM's laboratory and pilot treatment testing using equipment supplied by AECOM. The existing wells already had filtration treatment equipment for removal of iron, manganese and radium. The pilot testing incorporated the existing treatment process in the process flow stream for removal of the additional contaminants. Processes pilot tested include advanced oxidation using Ultraviolet Light and advanced oxidation using Ozone and peroxide. AECOM is currently designing treatment modifications at Well 4 that include air stripping, and advanced oxidation using Ozone and Hydrogen Peroxide. AECOM will be conducting additional pilot testing at Well 6 before proceeding with design. Pilot testing was led by Angel Gebeau, and quality control reviews by Dennis Saari. Pilot testing was completed in 2016.

Pilot Testing

Client: Edina Water Utility

Contact: David Goergen

Telephone: 952-826-0312

Key Staff: Angel Gebeau

AECOM assisted Edina Water Unity with pilot treatment testing for Water Treatment Plant No. 6. Design engineering for Pilot Study and subsequent water treatment system design for 4,400 gpm treatment system. Facility removes iron, manganese, radium, and vinyl chloride using, chlorine oxidation, HMO addition, green sand filtration, and air stripping. The facility was constructed within an existing parking structure. Polyphosphate chloride and fluoride are added to the treated water prior to distribution to the water system. Pilot testing was led by Angel Gebeau, and was completed in 2011.

Estimated Fees

AECOM proposes to provide the services in this proposal for a lump sum fee of $19,800. AECOM's portion of the services are $12,300 and ATEC's services are $7,500.

If there is a need to extend the pilot testing, the additional fee is estimated at a lump sum of $8,150 per week. AECOM's portion of the services are $3,150 and ATEC's services are $5,000 per week.

The fee is based on evaluating up to three filter media options. We have not included pilot testing of ozone based on past experience showing ozone not usually cost effective when compared with other options or iron and manganese treatment. If during the study, the other treatment options are not being effective, ozone may be added to the project scope with additional fee related to rental of ozone equipment.

The fee for the first week of testing includes 24-hour operation for seven days. The fee for the additional weeks of testing include 24-hour operation for five days.

The estimated fee includes an allowance of $1,500 per week for laboratory testing.

Dennis Saari, P.E.

Project Manager

Education
BS, Civil Engineering, University of Wisconsin - Platteville

Licenses/Registrations
Professional Engineer - Wisconsin, Virginia, North Dakota

Years of Experience 40

Professional Associations
American Water Works Association

Dennis specializes in planning, design, and managing potable water projects, including wells, pumping stations, transmission main, water treatment plants, water storage reservoirs, and elevated towers. Below are just a few of the projects similar to the Kronenwetter project.

Experience

Minnesota Pollution Control Agency, Saint Louis Park.

Wells 4 and 6 water treatment technical advisor and quality control reviewer for pilot scale treatment testing and water treatment plant design.

Minnesota Pollution Control Agency, Saint Louis Park.

Wells 12 pilot testing and water treatment plant design. Project manager for pilot scale treatment tests for iron and manganese removal at proposed Well 12. Currently project manager for design of the well and treatment facilities.

Village of Kronenwetter, Well No. 2 Water Quality Investigation, Kronenwetter, Wisconsin.

Project manager and lead project engineer for a study of increasing concentrations of iron and manganese in a municipal water supply well.

Village of Lake in the Hills, Well 12 Iron Removal, Lake in the Hills, Illinois.
Performed pilot scale testing of water treatment equipment, developed design concepts, and managed design of the 750-gpm water treatment plant. The plant includes aeration, gravity filtration, a detention tank, standby generator, and SCADA improvements.

Village of Spencer, Treatment Testing, Spencer, Wisconsin.
Performed pilot-scale treatment testing for treatment alternatives, evaluated treatment alternatives, and designed a 0.3-mgd treatment facility for iron and manganese removal for two wells. Plant includes packaged gravity system for aeration, detention, and filtration. Plant also includes chemical addition, booster pumping equipment, and backwash waste retention tank. Project also includes new central SCADA system for water system.

Village of Campbellsport, Central Water Treatment Facility and Water Operations Center, Campbellsport, Wisconsin. Performed pilot scale testing of water treatment equipment to verify performance and optimize design. Managed and designed a central treatment plant for removal of dissolved iron and manganese and corrosion control. Plant is automated with computer technology and includes recycling of backwash water to minimize waste production. Plant includes aeration, concrete ground storage reservoir, booster pumping equipment, pressure filtration equipment, and chemical feed equipment.

Dennis Saari, P.E., continued

City of Stevens Point, Water Treatment Plant, Stevens Point, Wisconsin.

Conducted pilot testing and treatment alternatives analysis and preliminary design for 14-mgd iron and manganese treatment facility.

North Dakota State Water Commission, Surface Water Treatment Plant Residuals Handling Facility Design, Various Locations, North Dakota.

Lead design of a residuals handling facility to dewater residuals from a new 6-mgd surface water treatment plant and an existing 12-mgd surface water treatment plant. Both treatment plants include a lime softening process which produces large volumes of residuals that need to be disposed.

Village of Lake in the Hills, Ammonium Removal Treatment Modifications to the Well 6 Water Treatment Plant, Lake in the Hills, Illinois.

Managed a project for adding ammonium removal to an existing water treatment plant designed for iron removal. Improvements included construction of a chlorine contact tank, additional chlorination equipment, well pumping equipment modifications, and high lift pumping with a variable frequency drive.

Village of Lake in the Hills, Well 16 Water Treatment Plant, Lake in the Hills, Illinois.

Project manager for pilot scale treatment study for iron and manganese removal plant. Then proceeded with the design phase for the full-scale plant, which includes an induced draft aerator, gravity filtration equipment and related chemical feed, pumping equipment and standby generator.

City of Mankato, Water Treatment Plant Design, Mankato, Minnesota.

Project manager for design of a water treatment plant expansion including lime softening, ultrafiltration membranes, gas chlorination, high lift pumping, treated water reservoir, related chemical feed equipment and SCADA improvements.

Village of Plover, Well 3 Nitrate Removal, Plover, Wisconsin.

Project manager for the design of an ion exchange water treatment facility for Plover's Well 3, designed for nitrate removal.

Angel Gebeau, P.E., BCEE

Drinking Water Engineer

Education

BS, Environmental Engineering, Michigan Technological University, 2001

Licenses/Registrations
Professional Engineer: WI, MN, TX, VA

Board Certified - American Academy of Environmental Engineers

Years of Experience
14

Professional Associations American Water Works Association

Experience

Minnesota Pollution Control Agency, Saint Louis Park.
Wells 4 and 6 water treatment. Lead design engineer for pilot scale treatment and water treatment facilities.

Water Treatment Plant 6, City of Edina, Minnesota.
Design engineer responsible for water treatment process design from feasibility and pilot study protocol development through shop drawing review. Treatment capacity is 4,400 gpm and treats water from four well sources. Facility designed for removal of iron, manganese, radium, and vinyl chloride. Treatment processes include oxidation/ disinfection with chlorine gas, hydrous manganese oxide addition for radium adsorption, horizontal pressure filters with activated media for iron, manganese, and radium removal. Includes low profile air strippers with slide-out trays for vinyl chloride removal, high service pumping, and chemical feed systems for fluoride and polyphosphate. System had unique site constraints with construction in the lower level of an existing parking garage.
Project was awarded MN 2013 ACEC Grand Award.

Madison Water Utility, Well 29 Pilot Study, Madison, Wisconsin. Project Engineer conducting the pilot studies for five alternative treatment processes for the removal of iron and manganese. Successfully met Madison Water Utility goals of less than 100 µg/L iron and less than 10 µg/L manganese. A pilot system plan was developed prior to the start of the pilot study. The pilot study plan outlined the impacts iron and manganese have in the drinking water system. Treatment processes evaluated included greensand filtration, manufactured greensand filtration, treated anthracite/sand filtration, pyrolusite filtration, and membrane filtration along with chlorine, permanganate, and air oxidation. Pilot study evaluated the life cycle cost for each alternative and the potential to recycle the wastewater stream. The pilot system was operated for four weeks.

Edina Water Utility, Water Treatment Plant No. 6, Edina, Minnesota.
Design engineer for Pilot Study and subsequent water treatment system design for 4,400 gpm treatment system. Facility removes iron, manganese, radium, and vinyl chloride using, chlorine oxidation, HMO addition, green sand filtration, and air stripping. Facility was constructed within an existing parking structure. Polyphosphate chloride and fluoride are added to the treated water prior to distribution to the water system.

Ammonia Removal Alternatives Analysis, City of Hutchinson, Minnesota.
Design engineer completing air stripping modeling using Aeration System Program to evaluate effectiveness of ammonia removal via air stripping.

Euphrates River Water Technical Proposal, Fluor-Amec.
Completed modeling of carbon dioxide air strippers following RO treatment of river water in conceptual design review for Rebuild Iraq initiative.

Angel Gebeau, continued

City of Mankato, Water Treatment Plant Upgrade, Mankato, Minnesota. Process designer and start-up coordinator for ultrafilter membrane treatment process addition for the plant. Water treatment facility design included lime softening densators, recarbonation, membrane filtration, chemical addition, water storage, and final pump station. The final treatment facility treats 12 mgd of groundwater under the influence of surface water.

Well 9 TCE Alternatives Analysis, Ripon Water Utility, Ripon, Wisconsin. Project engineer completing a study of viable TCE treatment alternatives and cost estimates for TCE removal at Well 9. Alternative analysis included new well construction, air stripping, and GAC treatment.

Well 9 Treatment Design, WDNR, City of Ripon, Wisconsin. Process design engineer for design and construction oversight services for a 600-gpm treatment facility for TCE removal at Well 9. Design includes low-profile tray tower air stripper, blowers, monitoring, new gas chlorination equipment, fluoride and polyphosphate feed equipment, reservoir for chlorine contact time, high-lift pumping, and various related instrumentation and controls.

Zimmerman Water Utility, Iron and Manganese Treatment Plant, Zimmerman, Minnesota. Quality control review for iron and manganese removal system using chlorination and proprietary media filtration for removal of iron and manganese from groundwater well.

Beverly Hills WTP, Beverly Hills, California. Completed modeling of carbon dioxide air strippers.

Ripon Water Utility, Well 8 Treatment Review, Ripon, Wisconsin. Completed a review of the existing Well 8 iron treatment system to evaluate potential improvements for iron treatment. Chemical addition alternatives including sequestering and moving the oxidation location were reviewed. The impact of the existing aeration contact tank was completed.

Watertown Water Utility, Manganese Treatment Evaluations, Watertown, Wisconsin. Completed a review of three existing treatment systems for manganese removal. Recommended operational changes that resulted in substantial improvement in treatment performance and reduced wastewater production.

Madison Water Utility, Well 29 Water Treatment Facility, Madison, Wisconsin. Process design engineer for iron and manganese treatment facility expansion to existing Unit Well 29 facility. Filtration system includes pyrolusite sand, chlorine only oxidation, 8 pressure filtration vessels, backwash water tanks, backwash recycle.

Village of Amherst, Pilot Study, Amherst, Wisconsin. Completed a pilot study for iron and manganese removal for the village of Amherst. Included an evaluation of oxidants and filter media for optimum treatment performance. Used gathered information to provide a cost estimate for treatment plant construction.

Town of Greenville, Well #2 Treatment Facility, Greenville, Wisconsin. Developed a cost estimate and recommended the best alternative for arsenic treatment from alternatives provided by EPA. The treatment system is arsenic co-precipitation with iron with chlorine as the oxidant. Designed well pump, chemical feed equipment, treatment facility, and other ancillary items to support the EPA provided treatment equipment. Designed HMO system for radium removal. Chemical feed includes sodium silicate.

Town of Greenville, Well #4 Radium and Iron Removal Treatment Plant, Greenville, Wisconsin. Project engineer for Well #4 water treatment plant with iron, manganese, radium and gross alpha removal. Hydrous manganese oxide (HMO) treatment was designed for radium removal, combined with iron oxidation and filtration for a complete treatment process. Participated in operating a pilot plant for radium, gross alpha, manganese, and iron removal, completing a conceptual design, completing final design, and creating specifications and drawings. Includes sodium silicate feed for control.

Confidential Client, Water System Study, Plover, Wisconsin. Design engineer responsible for review of existing treatment process, alternative evaluation, cost estimation, and report creation. Evaluated operation of existing 9 wells, raw water storage, iron and manganese removal system, and pumping. Documented historical increase in nitrates and manganese in the wells. Provide design basis and cost for blending for nitrate reduction and cost for future nitrate treatment. Noted deficiencies in the existing treatment system results in manganese breakthrough. Greensand coating is being exhausted due to chlorine dioxide feed system failures resulting in poor manganese removal. Provided preliminary design and cost for improvements to a sodium hypochlorite feed system and media coating. Evaluated other recommended improvements and provided costs including operations and control system upgrades, filter feed and booster pump upgrades, chlorine feed control system upgrades, and pipe and valve review and replacement.

Tom Degen, P.E.

Quality Control

Education

BS, Civil Engineering, University of Wisconsin, Platteville

Years' Experience
31

Registration
Professional Engineer – Wisconsin

Experience

City of La Crosse, Water Discoloration Evaluation, La Crosse, Wisconsin.
Project manager for investigation of water discoloration complaints on the north side of the city. Inspected hydrant flushing tests, interviewed residents, collected and analyzed samples of raw water and solids residue from flushing samples. Used the water distribution system model to evaluate water age in the water system. A report was prepared concluding that the most likely source of discoloration (primarily black) was an increase of manganese in the north wellfield resulting from reduction of organics in the aquifer that is under the influence of the nearby river. Recommended manganese sequestering as an option to reduce precipitation of manganese.

City of La Crosse, Water System Facility Planning, La Crosse, Wisconsin. Project manager for study to evaluate treatment options for manganese removal at wells and identified and recommended maintenance actions for controlling manganese deposition in the water distribution system. The city was experiencing fairly chronic problems with dirty water in the northern areas of the city. Managed evaluation of test results; alternatives analysis, evaluation of non-treatment methods (including sequestering), review of treatment technologies, review of alternatives, screening workshop and consolidation of data into a comprehensive facility plan.

Town of Greenville, Well No. 2 Treatment Facility, Greenville, Wisconsin. Reviewed an EPA grant for equipment for an arsenic removal study. Managed a project to design a treatment facility for arsenic removal to include process equipment for co-precipitation of arsenic with iron and using chlorine as the oxidant. Worked with EPA and the treatment package vendor to gain approval of the treatment process from Wisconsin DNR. After radium was discovered by EPA, AECOM also designed a system to feed hydrous manganese oxide (HMO) to remove the radium.

McCain Foods USA, Water Treatment System Evaluation, Plover, Wisconsin. Project manager for a study to determine the effect of pH adjustment on manganese removal treatment and water use applications in plant processes. Evaluated the effectiveness of greensand media to remove high manganese concentrations in full-scale studies using chlorine dioxide treatment and batch permanganate treatment. Results were used to make treatment improvement recommendations with construction estimates.

Town of Greenville, Well 4 Radium and Iron Removal Treatment Plant, Greenville, Wisconsin.
Project manager for pilot testing, design, and construction of a treatment plant for the new well to remove both iron and radium, which was detected at concentrations above action limits. The plant includes HMO processes along with iron filtration.

Tom Degen, continued

Village of Lake in the Hills, Well 16 Construction, Lake in the Hills, Illinois.
Assisted with construction related services and project close-out services associated with the construction of the Well 16 iron removal treatment plant and pumping systems.

Plover Water Utility, Water Utility Master Plan, Plover, Wisconsin.
Quality control reviewer for the completion of the water system master plan incorporating large growth from recent and planned developments. Responsible for updating hydraulic model, field tests, supply/storage analysis, improvement planning, and master plan report.

New London Utilities, Pressure Zone Boundary Realignment, New London, Wisconsin.
Project manager for the evaluation of pressure variations due to the realignment of a pressure zone boundary. Used a computerized hydraulic model to review the pressures and placed pressure data loggers at various points in the distribution system. Determined that pressure losses were due to operation of a booster pump when all supply pumps were not operating.

Town of Greenville, Well Siting Study, Greenville, Wisconsin.
Assisted the town with a search of a new well site to replace Well 2, which was contaminated with arsenic. Performed a contaminant source inventory and studied the local geology to locate good locations for a high capacity well with the least risk of future arsenic contamination. Assisted with addressing wetland issues and shore land issues associated with the selected site. Attended county zoning meetings to address siting issues and submitted a report to Wisconsin Department of Natural Resources for site approval.

Village of Lake in the Hills, Well 16 Construction, Lake in the Hills, Illinois.
Assisted with construction related services and project close-out services associated with the construction of the Well 16 iron removal treatment plant and pumping systems.

Plover Water Utility, Water Utility Master Plan, Plover, Wisconsin.
Quality control reviewer for the completion of the water system master plan incorporating large growth from recent and planned developments. Responsible for updating hydraulic model, field tests, supply/storage analysis, improvement planning, and master plan report.

New London Utilities, Pressure Zone Boundary Realignment, New London, Wisconsin.
Project manager for the evaluation of pressure variations due to the realignment of a pressure zone boundary. Used a computerized hydraulic model to review the pressures and placed pressure data loggers at various points in the distribution system. Determined that pressure losses were due to operation of a booster pump when all supply pumps were not operating.

Town of Greenville, Well Siting Study, Greenville, Wisconsin.
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AECOM

About AECOM

AECOM is a global provider of professional technical and management support services to a broad range of markets, including transportation, facilities, environmental, energy, water, and government. With approximately 45,000 employees around the world, AECOM is a leader in all of the key markets that it serves. AECOM provides a blend of global reach, local knowledge, innovation, and technical excellence in delivering solutions that create, enhance, and sustain the world's built, natural, and social environments. A Fortune 500 company, AECOM serves clients in more than 150 countries and had revenue of $8.1 billion during the 12 months ended December 31, 2013. More information on AECOM and its services can be found at www.aecom.com.

Contact

Dennis Saari, P.E., Project Manager
dennis.saari@aecom.com
715-342-3041

AECOM
200 Indiana Avenue
Stevens Point, WI 54481

Proposal

for Water Treatment Investigation

Well Number 2 – Pilot Treatment Plant Study

Village of Kronenwetter, Wisconsin

Presented to:

Duane Gau
Director of Public Works

August 24, 2016

BECHER HOPPE

330 N. 4th Street
Wausau, WI 54403-5417

Telephone: 715-845-8000

www.becherhoppe.com

BECHER HOPPE
Engineers and Architects

330 N. 4th Street, Wausau, WI 54403-5417
Telephone: 715-845-8000 | www.becherhoppe.com

August 24, 2016

Duane Gau
Director of Public Works
Village of Kronenwetter Public Works Department
1582 Kronenwetter Drive
Kronenwetter, WI 5445

Subject: Request for Proposals
Well Number 2 – Pilot Treatment Plant Study

Dear Mr. Gau:

Becher-Hoppe Associates, Inc. welcomes the opportunity to put its experienced project team to work assisting the Village in investigating an effective treatment method to reduce the levels of iron and manganese in the potable water at Well Number 2.

You will benefit from your association with the Becher Hoppe / Tonka Water team because of our:

Experience: You will benefit from Tonka Water's experience with many water quality investigation projects as well as Becher Hoppe's water treatment project experience. Our 20+ years' experience with the Kronenwetter potable water supply allows us to develop an unmatched awareness of the water quality and needs.

Accessibility: You will have maximum access to the Becher Hoppe / Tonka Water team both during scheduled meetings and at times when personal consultation is necessary.

Design Approach: By combining the best of the resources of our two firms, you are ensured prompt and professional completion of the project. We have a proven track record of "thinking outside the box" to bring our clients innovative solutions to meet their particular needs.

We look forward to meeting with you to discuss the project.

Sincerely,

Marijean M. Hoppe

Marijean M. Hoppe, PE
Vice President of Operations
Becher-Hoppe Associates, Inc.

Sincerely,

Stephen M. Opatik

Stephen M. Opatik, PE
Project Manager
Becher-Hoppe Associates, Inc.

Corporate Profile

Becher-Hoppe Associates, Inc.

Membership

American Association of Airport Executives (AAAE)

American Council of Engineering Companies (ACEC)

American Public Works Association (APWA)

American Society of Civil Engineers (ASCE)

American Water Works Association (AWWA)

Association of State Dam Safety Officials (ASDSO)

Institute of Transportation Engineers (ITE)

International Right of Way Association (IRWA)

National Society of Professional Engineers (NSPE)

National Society of Professional Surveyors (NSPS)

Wisconsin Society of Land Surveyors (WSLS)

Awards

Engineering Excellence State Finalist Award (ACEC)

2014 – Wausau Downtown Airport SRE Building
2013 – Wausau Wastewater Treatment Plant
2012 – City of Wausau 400 Block

Excellence in Airport Construction Engineering (WisDOT Bureau of Aeronautics)

2014 – Price County Airport
2013 – Merrill Municipal Airport
2012 – Crandon-Steve Conway Municipal Airport

Project of the Year Award (APWA)
2012 – City of Wausau 400 Block

Our Mission

To improve communities through engineering excellence.

Becher Hoppe provides a wide spectrum of professional services to government, business, and individuals from our headquarters in Central Wisconsin. We provide planning, design, and construction services for civil engineering projects that involve airports; highways, bridges, roadways and trails; municipal buildings; water and wastewater treatment systems; municipal utilities; stormwater management and dams; solid waste facilities; real estate appraisal and acquisition; and land surveying, mapping, and land planning. We have been serving our clients continuously since 1954.

Our Core Values

Service, Integrity, Excellence, Partnership

The Associates at Becher Hoppe are conscientious in assessing each client's project needs and then applying a balance among new technology, innovative solutions, and tried and tested methods to meet them. Our employee group is diverse in education, expertise, and experience. Employees that have construction review responsibilities also have substantial practical experience. We form a complete team to fulfill our client's desired outcomes.

Company Information

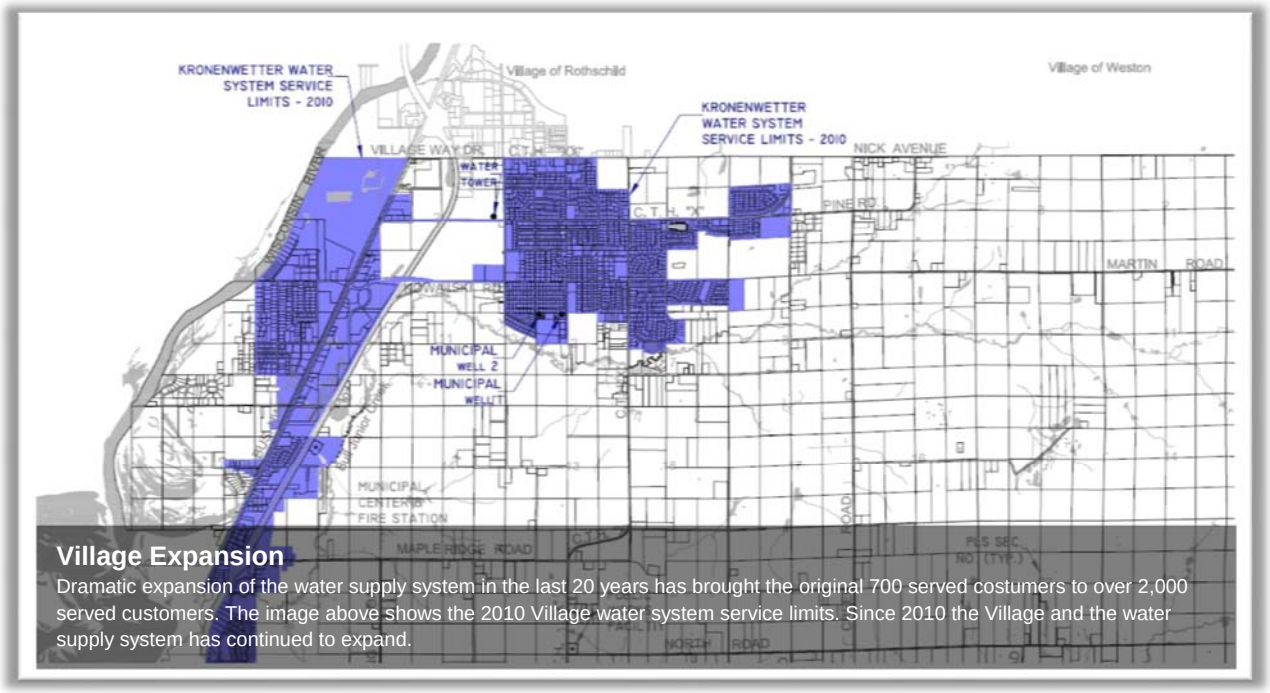
Address: 330 N. 4th Street, Wausau, WI 54403-5417

Telephone Number: 715-845-8000

Website Address: www.becherhoppe.com

Project Understanding

Becher-Hoppe Associates, Inc. has been an integral partner with the Village of Kronenwetter since the Kronenwetter Sanitary District No.2 first provided water supply, water storage, water distribution and wastewater collection in 1996 to approximately 700 customers. The Village currently serves approximately 2,100 customers. The water supply system is served by two 90-foot gravel pack wells that supply approximately 700 gallons per minute to a 300,000-gallon storage reservoir and 58 miles of watermain.



Village Expansion

Dramatic expansion of the water supply system in the last 20 years has brought the original 700 served costumers to over 2,000 served customers. The image above shows the 2010 Village water system service limits. Since 2010 the Village and the water supply system has continued to expand.

First indications of water quality issues arose in the spring of 2005 when several water discoloration events occurred. Testing of raw water samples indicated that a substantial increase in the manganese levels at Well No. 2 had occurred since testing in prior years.

The next indication of water quality issues arose in early 2016 when several water discoloration events occurred. Some of the events were traced back to the construction and flushing of a new watermain extension while other events were random and occurred when there were no impeding activities taking place on the water system. New test batches showed that manganese levels remained relatively consistent with the 2005 levels while the iron levels had made a considerable jump. Levels of manganese and iron are now approaching 0.25 and 0.55 ppm respectively.

The discoloration of water in the Village is believed to be from an increase in mineral accumulations within the distribution system being released due to construction flushing and normal day to day fluctuation in flows.

Becher Hoppe understands that the Village is looking for a viable treatment method in order to reduce the levels of iron and manganese in the water produced from Well No. 2. We also understand that reducing the level of minerals entering the distribution system will prolong its useful life. At Becher Hoppe, we know how important it is to provide a safe drinking water supply to the Village that also does not damage the distribution system.

Approach

Becher-Hoppe has assisted numerous communities in the local area with testing and evaluating potential water treatment processes. As stated in the Village's project scope, pilot testing shall include evaluation of treatment alternatives such as air oxidation, potassium permanganate oxidation, ozone oxidation and/or other methods. It has been our experience that manganese oxidation by air is a slow and incomplete process. Based on our experience with pilot studies for nearby communities, we are proposing to evaluate chlorine and potassium permanganate as the oxidation chemicals for the pilot study. It is also our experience that manganese greensand filter media or manganese coated media offer a benefit to the manganese removal process in case there is an oxidation chemical "overfeed" or "underfeed" event. The use of these types of filter media also allows the utilization of higher than normal filtration rates.

Basic Pilot Approach

Our Basic Pilot Proposal will evaluate utilizing two oxidants – chlorine and potassium permanganate and two alternate filter media – anthracite/greensand and manganese coated media. The benefit of air scouring the media will also be considered during the pilot study.

Tonka Water
Becher Hoppe will be partnering with Tonka Water who will provide the filter columns for the Basic Pilot Proposal.

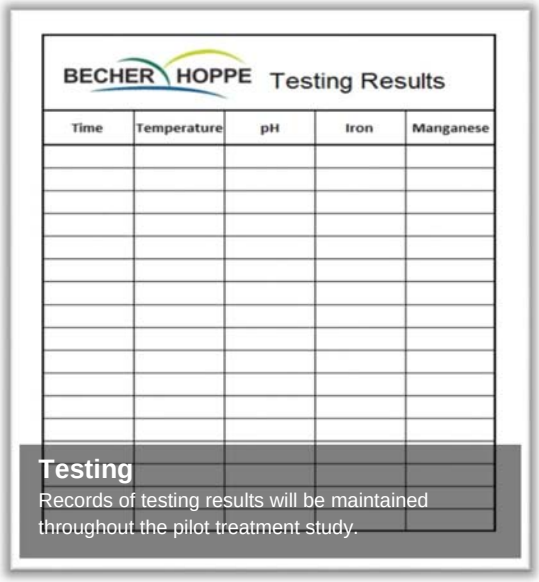
If the Basic Pilot Proposal testing does not achieve the desired iron and manganese removal, we would recommend including, evaluation of filtration aids with detention time for coagulation and flocculation to the Base Pilot Proposal. This work would be performed as an additional scope of work. If this combination of the Base Pilot Proposal with filtration aids does not achieve the desired removals, we would recommend the evaluation of ozone oxidation with anthracite/sand media. This work would also be performed as an additional scope of work.

While air oxidation will not be evaluated as an oxidation alternate for iron and manganese removal, we will evaluate aeration of the well water for carbon dioxide removal. Removal of carbon dioxide makes the well water less corrosive by increasing the pH and has the added benefit of reducing chemicals costs.

The Basic Pilot Proposal will evaluate filtration rates over a range of 2.0 GPM/sq. ft. to 9.0 GPM/sq. ft. The goal of the pilot testing will be to establish the optimum operating scenario of chemical feed dose versus filter performance versus iron/manganese removal efficiency. The pilot testing will explore how various concentrations of each oxidation chemical (chlorine or potassium permanganate) affect filter media pressure drop and how much iron and manganese is removed (removal efficiency). Typically, filter runs are extended to preset maximum filter head loss setpoints or exceedance of the MCL for iron and manganese.

Throughout the pilot testing, field samples will be collected and analyzed on-site for temperature, pH, iron, and manganese levels. Laboratory analysis verification of field testing will also be performed. Raw water samples will be collected at the beginning and end of the pilot study for laboratory analyses. Records will be maintained on the following characteristics to be analyzed:

- pH
- Total Hardness
- Total Alkalinity
- Phenolphthalein Alkalinity
- Total Dissolved Solids
- Iron
- Manganese
- Chlorine Residual (as needed)



Testing
Records of testing results will be maintained throughout the pilot treatment study.

Laboratory Testing
Testing will take place throughout the pilot treatment study to ensure the optimum treatment method is obtained.

Laboratory analysis of the optimum treated water quality for each oxidant/filter media combination will also be conducted. Records of the treated water will be maintained on the following characteristics to be analyzed:

- pH
- Total Hardness
- Total Alkalinity
- Phenolphthalein Alkalinity
- Total Dissolved Solids
- Iron
- Manganese
- TTHMP
- Chlorine Residual (as needed)

To determine the Total Trihalomethane Formation potential, the optimum treated water for each oxidant/filter media combination will be disinfected utilizing sodium hypochlorite at current water utility feed rates. The analysis will be completed after a 24-hour detention time.

The filter backwash of the optimum treated water for each oxidant/filter media combination will be evaluated for gravity settling and supernatant re-use. The supernatant will be analyzed for all of the previous analyzed characteristics except TTHMP.

The corrosiveness of the optimum treatment process will be determined utilizing the Langelier Saturation Index.

Project Deliverables

A final report will be delivered to the Village at the end of the Pilot Treatment Study and will include, at a minimum, the following items:

1. Narrative summary of the pilot plant testing procedures and results.
2. Tables and charts of the pertinent data and test results collected on water quality and on other necessary data collected during the study.
3. A recommendation on the optimum treatment method, oxidation agent, type of filter media, and size of equipment to treat 700 to 800 gpm. The recommendation will include an alternative for addressing adequate disinfection practices for microbial protection. The Wisconsin Department of Natural Resources (WDNR) has become concerned about the potential of microbial exposure of shallow wells in highly porous sand and gravel aquifers throughout the State. The existing Kronenwetter wells are 90 feet deep but are considered to be shallow and are located in a sand and gravel aquifer. For these locations, the WDNR is recommending disinfection practices to achieve a 4 log inactivation of viruses and a 4 log inactivation of giardia lamblia and cryptosporidium. This requires a “CT” calculation of at least 150. The “CT” calculation is the product of the residual disinfection concentration (mg/l) prior to the first customer multiplied by the disinfecting contact time (minutes) to reach the first customer. The existing wells pump directly into the distribution system and offer very little time for disinfecting before reaching the first customer and have a “CT” calculation of less than 10. The existing well will not be able to meet the WDNR microbial policy. Disinfection in combination with a pressure filtration system also would not be able to meet the recommended “CT” calculation.
4. Discussion on the impact of adding a future well of a similar capacity which may also need treatment.
5. A budget cost for the project which will include the preliminary design, PSC approval, final design and construction costs.
6. Preliminary estimate of annual operating costs.
7. A time table for design, regulatory approval, and construction if the Village elects to implement the recommended treatment process.

Becher Hoppe will provide the Village with an initial draft report in PDF form to the Village for review. When the draft report is accepted, Becher Hoppe will provide 20 hard copies of the report and a complete electronic PDF copy of the report narrative, tables, charts, figures, and all of the appendices.

Project Schedule

The project will take place according to the following schedule set by the Village:

1. Pilot Plant Testing – October 24 – November 6, 2016
2. Draft Report Submitted to the Village – November 30, 2016
3. Final Documents Completed and Submitted to Village – 7 Days After Village Review & Comment

Proposed Timeline for Well No. 2 Pilot Study

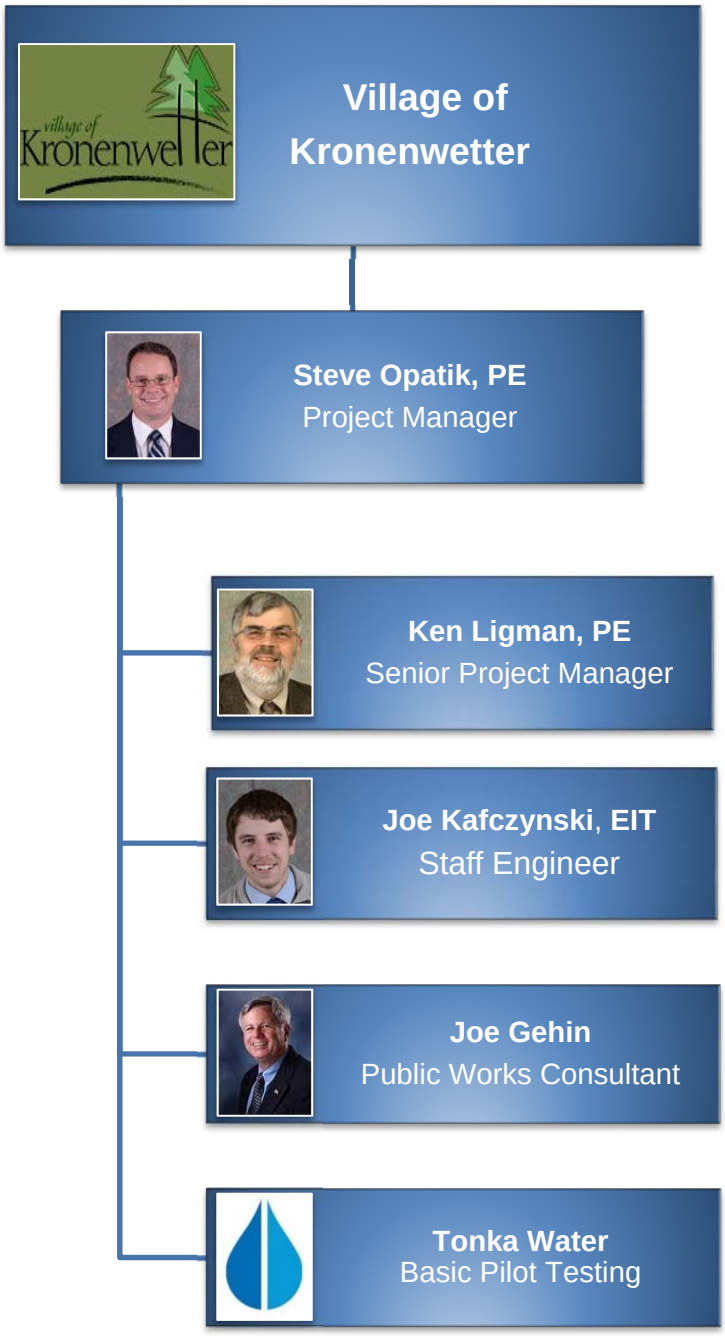
Major Tasks	October	November	December
Pilot Plant Study			
Preliminary Documents			
Final Documents			

Project Team

A Committed Team

Steve Opatik, PE, will manage the project and be the primary point of contact for the Village of Kronenwetter. Steve can be reached at 715-845-0418 or sopatik@becherhoppe.com. Ken Ligman, PE and Joe Gehin will be instrumental in finding the optimum treatment scheme for the well as and will provide insight on future well requirements. Joe Kafczynski will assist in the on-site oversight and sample collecting.

The team will utilize a quality assurance / quality control approach to performing their work and track project progress to ensure the Village's schedule is met.



Stephen M. Opatik, PE
Project Manager

Education

Bachelor of Science
Civil-Environmental Engineering
University of Wisconsin

Registration

Professional Engineer
Wisconsin

Continuing Education

Enrolled,
University of Wisconsin – Madison Graduate School, Environmental Engineering

Wausau Region Chamber of Commerce Leadership Excellence Program Graduate

Membership

American Society of Civil Engineer (ASCE)

American Water Works Association (AWWA)

Wisconsin Society of Professional Engineers (WSPE)

Central States Water Environment Association (CSWEA)

Community

Newman Catholic Schools Education Commission

Resurrection Parish Council Chair

Resurrection Parish Board of Directors

Mr. Opatik is a Project Manager and is responsible for project management, planning, design, and construction oversight for water and wastewater facilities.

Stephen's work includes facility design assistance, permitting and environmental document preparation.

Projects

Village of Rothschild
Water Treatment Facility, Well Construction, Watermain Extensions

Village of Weston
Water Supply Well No. 5 Construction

Town of Rib Mountain
Water System Evaluation

Town of Shelby
Watermain Extension, Well and Water Tower investigation

City of Schofield
Water Construction, Well Modification

Village of Withee
Water Treatment Facility

Village of Marathon City
Water Treatment Facility

City of Wausau
Water Treatment Facility Addition

Village of Fairchild
Water Supply Well Construction

Kenneth J. Ligman, PE

Senior Project Manager

Education

Master of Science
Civil Engineering
Environmental Engineering Emphasis
University of Wisconsin

Bachelor of Science
Civil Engineering
University of Wisconsin

Registration

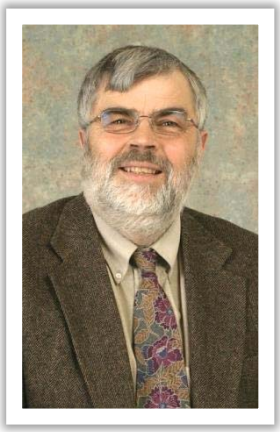
Professional Engineer
Wisconsin

Membership

American Society of Civil Engineers (ASCE)

Water Environment Federation

American Water Works Association



Mr. Ligman is a Senior Project Manager and is responsible for providing common sense solutions to unique water resources challenges.

Ken specializes in water supply, treatment, distribution and storage, and wastewater collection, rehabilitation, transport, and treatment design.

Projects

Kronenwetter Sanitary District No. 2, Village of Kronenwetter
Wastewater Collection and Transport Facilities and Water Supply/Storage and Distribution System

Kronenwetter Sanitary District No. 2, Village of Kronenwetter
Sanitary Sewer and Watermain Master Planning for Determination of Future Sewer Service Area

City of Wausau
Engineering Evaluation of Water Supply, Treatment and Distribution Facilities

Village of Rothschild
Engineering Evaluation of Water Supply Iron and Manganese Removal Facilities

City of Mosinee
Engineering Evaluation of Water Supply Iron Removal Utilizing Ozone Water Treatment Facilities

City of Montreal
Municipal Water Supply Wells and Distribution System

Wisconsin Rapids
Municipal Water Supply Wells and Distribution System. Pilot Water Treatment Programs

Village of Weston
Municipal Water Supply Wells and Water Quality Investigation

Marathon City
Bench Scale Jar Testing at Water Treatment Facilities

Joe R. Kafczynski, EIT
Staff Engineer

Education

Bachelor of Science
Environmental Engineering
Michigan Technological University

Associate of Science
Gogebic Community College

Membership

Wisconsin Wastewater Operators' Association (WWOA)

Wisconsin Rural Water Association (WRWA)

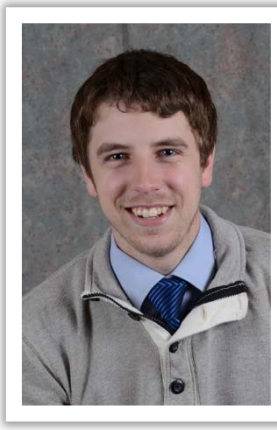
American Water Works Association (AWWA)

Water Environment Federation (WEF)

Certification

Highway Technician Certification Program (WisDOT)

- *Nuclear Density Technician I*
- *Aggregate Technician I*
- *Transportation Materials Sampling*



Mr. Kafczynski is a Staff Engineer and is responsible for providing common sense solutions to unique water resources and construction challenges.

Joe specializes in water supply, treatment, distribution and storage, and wastewater collection, rehabilitation, transport, and treatment design. He also has an extensive concrete, construction, and construction supervision background.

Projects

Village of Rothschild
Construction Oversight on Kort St. Watermain Installation and Construction of Well No. 6

City of Schofield
Construction Oversight on West Grand Ave. and Metro Drive Utilities Rehabilitation projects and Capacity, Management, Operation, Maintenance (CMOM) Preparation

City of Wausau
Uni-Directional Hydrant Flow Analysis and Mapping Along with Hydraulic Grade Line Analysis of the Wausau Waste Water Facility

City of Montreal
Capacity, Management, Operation, Maintenance (CMOM) Preparation

Town of Pence
Capacity, Management, Operation, Maintenance (CMOM) Preparation and Preliminary and Environmental Engineering Reports Along with Sewer Televising Project Representative

Town of Shelby
Tax Assessment for the Town of Shelby Watermain Project Along State Highway 33

Joe L. Gehin

Public Works Consultant

Education

Bachelor of Science
Water Chemistry and Resource Management
University of Wisconsin – Stevens Point

Certification

WI DNR – Water and Wastewater Operation

Membership

Wisconsin Water Association, Past President

Wisconsin Wastewater Operation Association, Past President

American Water Works Association

Water Environment Federation

Mr. Gehin is a Public Works Consultant with broad experience in water and wastewater systems.

Joe provides consulting services to public and private utility operators on system operations, maintenance, and evaluation. His professional experience includes wells, water booster stations, sewage lift stations, and water and wastewater treatment facilities.

Experience

Project Manager – Ghidorzi Construction
Project Manager responsible for overseeing water and wastewater treatment projects and utility construction projects, coordination with engineers, owners, and subcontractors and testing utility functions at startup. Management duties included compliance with contracts, developing construction schedules, project bidding and estimating, acquiring permits, scheduling and attending progress meetings, maintaining project timelines, and staying within budgets.

Director of Public Works and Utilities, City of Wausau
Director of Public Works and Utilities responsible for overseeing a team of engineers to plan, design, and administer the construction of streets, sanitary sewers, water mains, storm sewers, sidewalks, and parking ramps throughout the city; maintaining the day-to-day operations of all public utilities and the Department of Public Works. Annual capital expenditures for these areas of responsibility range from $3.5 to $5 million and require management of five private contractors.

Director of Utilities, City of Wausau
Director of Utilities responsible for directing and coordinating all operations of public utilities for the City of Wausau; directing and coordinating all construction projects to include $12 million dollars of wastewater treatment facility upgrades and a $5 million water plant expansion. These upgrades enabled the City to automate plant operations and reduce staff operating costs. Staffing levels were also reduced, realizing more than $1,000,000 in savings annually. Coordination of this change with the unions and Department of Natural Resources was a major undertaking.

Director of Quality Control - Green Bay Metropolitan Sewage District, Green Bay
Director of Quality Control responsible for quality control and plant operations and for the sewage district, coordination with contractors, and consulting with vendors and plant staff. It also involved serving as part of the startup team for a $72 million upgrade of the Green Bay Metro Sewage Facility.

Previous Pilot Studies

2004 Wisconsin Rapids Water Works and Electric Commission

Becher-Hoppe Associates, Inc. monitored the pilot study performed by Tonka Equipment Company. The project team established oxidant and medias to be evaluated in the testing. The team also recommended changes to chemical feed and filtration rates.

Reference: Wisconsin Rapids Water Works and Electric Commission

Contact Person: Dale Scheunemann, Water Superintendent
715-422-9045, Dale.Scheunemann@wrwwic.com

1999 Village of Marathon City Water and Sewer Utility

Becher-Hoppe Associates, Inc. monitored bench scale jar tests performed by Tonka Equipment Company. The project team established oxidant and medias to be evaluated in the testing. The team also recommended changes to chemical feed and filtration rates.

Reference: Village of Marathon City Water and Sewer Utility

Contact Person: Larry Heindl, Water Superintendent
715-581-0217, lheindl@marathoncity.org

1998 Village of Rothschild Water Utility

Becher-Hoppe Associates, Inc. monitored the pilot study performed by U.S. Filter Company. The project team established oxidant and medias to be evaluated in the testing. The team also recommended changes to chemical feed and filtration rates.

Reference: Village of Rothschild Water Utility

Contact Person: Tim Vergara, PE, Administrator of Public Works
715-359-3660, tvergara@rothschildwi.com

Basis of Payment – Lump Sum

We anticipate that the cost to perform the work of the Basic Pilot Proposal identified above will require six to eight days of full time pilot testing. Compensation for our work shall be on the basis of a lump sum fee as follows:

BHA	$12,500
Tonka Water	$16,000
TOTAL	$28,500

Compensation for additional scope work items will be provided if it should prove to be necessary to perform additional testing.

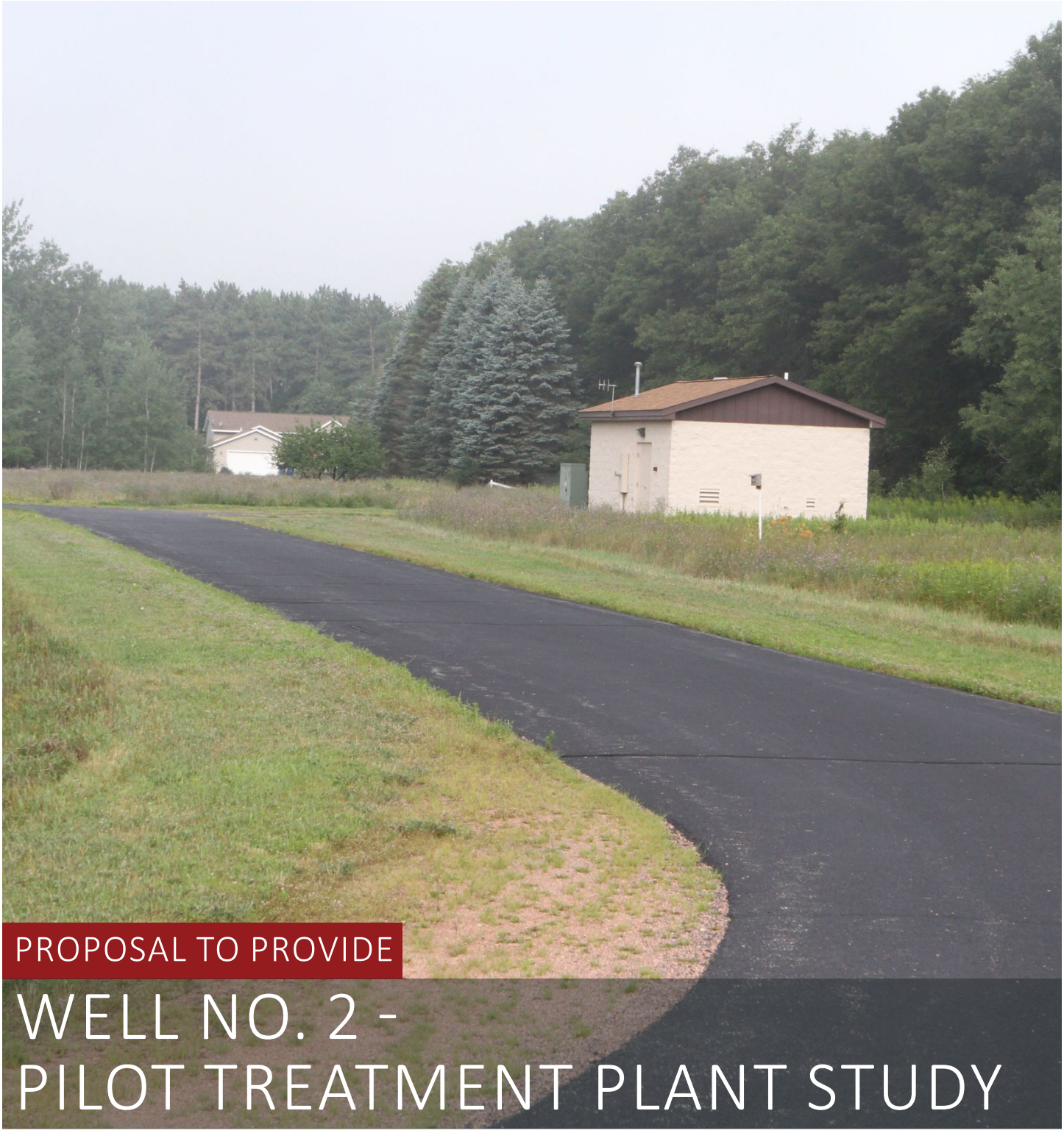
BECHER HOPPE

330 N. 4th Street
Wausau, WI 54403-5417

Telephone: 715-845-8000

www.becherhoppe.com

AGRICULTURE
AIRPORTS
BRIDGES
DAMS
MUNICIPAL
REAL ESTATE ACQUISITION
ROADS / HIGHWAYS
SITE DEVELOPMENT
SURVEY
UTILITY COORDINATION
WATER RESOURCES



PROPOSAL TO PROVIDE

WELL NO. 2 - PILOT TREATMENT PLANT STUDY

Prepared for the
Village of Kronenwetter
August 24, 2016

MSA PROFESSIONAL SERVICES

August 24, 2016

Duane Gau, Director of Public Works
Village of Kronenwetter
1582 Kronenwetter Drive
Kronenwetter, WI 54455

Re: Proposal for Engineering Services – Well No. 2 Pilot Treatment Plant Study

Dear Duane,

MSA Professional Services, Inc. (MSA) looks forward to the opportunity to assist the Village in the identification of a cost-effective treatment system for the reduction of iron and manganese levels in the water from Well No. 2. The aesthetic problems associated with the water from Well No. 2 are typical for the concentrations of iron and manganese that are present. The Village has attempted to mitigate these problems with polyphosphate addition and a unidirectional hydrant flushing program, and now wishes to explore options for water treatment to reduce iron and manganese concentrations in the water. The Pilot Treatment Plant Study will identify the most cost-effective treatment system at Well No. 2.

For your project, MSA has assembled a team that specializes in potable water treatment. The team members have specific experience in pilot testing that has led to the implementation of successful full-scale water treatment systems for iron and manganese removal. This proposal explains our understanding of your project and our approach toward helping you achieve the goals identified in your Request for Proposals (RFP). The proximity of our Marshfield office, and especially of MSA's Dan Borchardt, enables us to be available whenever you need us. For the pilot testing at Well No. 2 MSA will team with **WesTech Engineering, Inc.** WesTech (formerly known as General Filter Company) has a long resume of successful projects in Wisconsin for iron and manganese removal, and has performed pilot testing as part of the initial phase of many of those projects.

From our discussions with the DNR Public Water Engineering Section, it is MSA's understanding that the DNR workload is such that the minimum time for project approval is currently 60 to 90 days. To ensure that the project can proceed according to the schedule identified in your RFP, we have (with your authorization and at no cost to the Village) submitted our plan for pilot testing to the Wisconsin DNR for their required pre-approval. To ensure that the potential water treatment project remains eligible for a low-interest loan and potential grant under the DNR's Safe Drinking Water Loan Program, we plan to once again submit the required pre-application forms to the DNR on the Village's behalf, prior to the October 31, 2016 deadline.

We look forward to continuing our relationship with Kronenwetter through this important project that will identify the best solution for improving the quality of water provided to the Village's residences and businesses. Please feel free to contact me directly at (715) 305-2006 with any questions or comments regarding this proposal or the project in general. Thank you.

Sincerely,
MSA Professional Services, Inc.

Michael Voss, PE
Project Manager I Team Leader

MSA PROFESSIONAL SERVICES

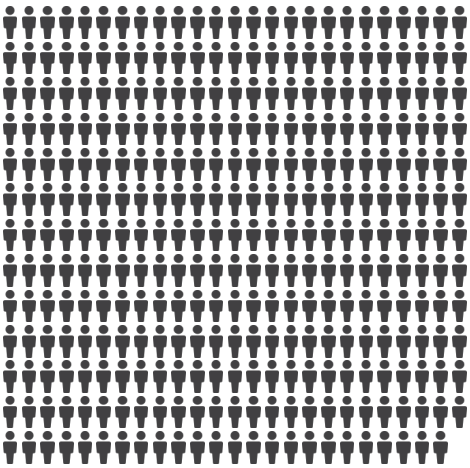
146 North Central Avenue, Suite 201, Marshfield, WI 54449

Contact: Michael Voss, PE
Phone: (715) 305-2006
Email: mvoss@msa-ps.com
Website: www.msa-ps.com

CONTENTS

MSA PROFESSIONAL SERVICES

324 TEAM MEMBERS



118
LICENSED PROFESSIONALS
(PE, AIA, PG, PLS, PH, SE, EIT)

ZWEIG **2015**
"BEST FIRMS TO WORK FOR"
HONOREE

48
INDUSTRY AWARDS EARNED SINCE 2010

"ENABLING PEOPLE TO POSITIVELY IMPACT THE LIVES OF OTHERS" SINCE **1962**

14
OFFICES

4
STATES

ARCHITECTURE
ENGINEERING
ENVIRONMENTAL
FUNDING
PLANNING
SURVEYING

$500 million
(and counting)

GRANTS AND LOW-INTEREST LOANS WE'VE HELPED OUR CLIENTS SECURE TO OFFSET THE COST OF INFRASTRUCTURE PROJECTS

100%
EMPLOYEE OWNED

MSA PROFESSIONAL SERVICES

Corporate Overview

As a full service consulting firm, MSA Professional Services (MSA) is all about creating communities that work. We partner with our clients to help them solve today's complex and multi-faceted infrastructure challenges and improve the quality of their neighborhoods. Our focus is on providing exceptional professional services to build strong communities.

MSA's roots reach back to the 1930s. Once a rural land survey company, our firm now consists of more than 300 engineers, architects, planners, funding experts, surveyors, GIS experts and environmental scientists. MSA excels at helping clients identify grant and funding sources and then delivering high quality, cost-effective solutions. Based in 14 offices across four states, our technical teams collaborate to assist communities throughout the Upper Midwest.

YOUR SUCCESS MATTERS.

Client Service Quality Assurance Program

Our firm constantly strives to improve our processes and tailor the services we provide to best suit each of our clients. As part of our ongoing quality assurance program, we periodically request feedback from clients and project stakeholders to create better project outcomes for you.

These easy-to-complete surveys offer you the opportunity to comment on several areas of our performance throughout the duration of your project, which in turn helps us adapt our processes to your unique needs. Your feedback is specific to your project, and is returned directly to the people working with you. We pledge to respond to any issues you identify as the project proceeds.

Unlike any survey you've ever taken before, your response will initiate specific improvement for you and your project. To fully demonstrate this program, you will soon receive a survey requesting your feedback on our ability to meet your expectations throughout the proposal process. We hope you'll take a few minutes to respond, experience the process first-hand, and see how we follow-up to your feedback.

How it will work during your project:

1. *The project manager or another team member asks for your feedback electronically.*
2. *You respond to a six-eight question, two-three minute survey.*
3. *Your response is immediately routed to the project team via email.*
4. *If any of your responses indicate exceptional performance or a problem, someone on the project team will follow-up and discuss ways to either improve the process, or make sure we continue to provide the level of service you desire.*
5. *We document any process changes and communicate them to the project team and back to you.*

PROJECT UNDERSTANDING

MSA met with Mark Thompson and Duane Gau on August 3rd and August 8th, respectively, to understand the project needs. MSA reviewed the Well No. 2 Water Quality Report completed by AECOM on May 13, 2014. MSA has reviewed potential future well locations with the Village and understands that future testing will determine the compatibility for treatment of Well No. 2 water.

The Village of Kronenwetter Water Utility includes two wells: Well No. 1 and Well No. 2. The two wells are located west of Lea Road in the west-central part of the Village and are approximately 500 feet apart. Both wells are constructed as relatively shallow screened wells in the sand-and-gravel aquifer, and each well produces approximately 700 gallons per minute (gpm). In spite of the close proximity and similar construction of the two wells, there are differences in water quality. Well No. 1 has consistently met all primary (health related) and secondary (aesthetic) drinking water standards established by U.S. EPA and Wisconsin DNR. Well No. 2 has also consistently met all drinking water standards, with the exception of secondary standards for iron and manganese.

The EPA and DNR water quality standards are 0.30 mg/L for iron and 0.05 mg/L for manganese. Levels of iron or manganese above these concentrations can cause aesthetic problems including discoloration of water and staining of laundry and sinks. Iron and manganese in the distribution system can also result in taste and odor problems.

When Well No. 2 was constructed in 1996, the concentrations of iron and manganese were very low, but these have increased over time. The concentrations of iron and manganese at Well No. 2 currently exceed the secondary drinking water standards, and the characteristic problems caused by elevated levels of iron and manganese have been observed. The iron concentration has increased to approximately 0.55 mg/l recently, while manganese has remained relatively constant at about 0.25 mg/l since 2005.

In response to several customer complaints regarding aesthetic problems from iron and manganese, the Village began adding polyphosphate to the water supply at Well No. 2 in 2005. Polyphosphate can keep low to moderate levels of iron and/or manganese in a soluble form (sequestering), which reduces the problems that would otherwise be caused by the insoluble precipitate forms of iron and/or manganese. Polyphosphate has been found to be effective in reducing or eliminating the problems in water distribution systems where low to moderate concentrations of iron and/or manganese are present. The Village has also implemented a unidirectional flushing program to reduce water quality problems in the distribution system.

In spite of the polyphosphate addition at Well No. 2, earlier this year there were several additional customer complaints related to discolored water. As a result, the Village has decided to explore options for water treatment to reduce the levels of iron and manganese entering the water distribution system at Well No. 2.

The goals of this project are to:

- Determine the most cost-effective treatment method which will reliably reduce iron and manganese concentrations to acceptable concentrations at Well No. 2;
- Determine the scope and size (preliminary design) of treatment equipment and appurtenances required, and the building to house the treatment equipment; and
- Develop a budgetary estimate of capital and operating costs for the complete water treatment system improvements.

Iron and manganese are commonly removed from potable water supplies with a treatment process involving oxidation of the iron and manganese to insoluble precipitates, followed by removal of the precipitates by filtration. In some cases the oxidation and precipitation reactions occur quickly, allowing for filtration to occur almost immediately downstream. Depending on other water quality issues, most often the presence of naturally occurring organics and/or amonia, the oxidation and precipitation reactions can be delayed. Where these reactions are delayed, a detention tank is sometimes necessary, resulting in the need for high lift pumps either upstream or downstream of the filter to deliver the treated water to the distribution system.

The two chemicals most commonly used for oxidation of iron and manganese are sodium hypochlorite (liquid chlorine) and potassium or sodium permanganate, either separately or in combination. Potassium permanganate is available in solid form and must be mixed with water before application. Sodium permanganate is available from chemical suppliers in liquid form and, while more expensive than potassium permanganate, is widely used at small-to medium-sized utilities because it avoids the need to manually "batch" the highly corrosive and staining solid potassium permanganate before use.

Aeration is sometimes used in combination with these chemicals to remove hydrogen sulfide or other gases, where present, and/or to reduce the chlorine required for oxidation of iron where the formation of regulated chlorination byproducts (trihalomethanes-TTHM or haloacetic acids-HAA) are a concern.

The filter media most commonly used for removal of iron and manganese are filter sand (with anthracite), synthetic manganese greensand (GreensandPlus™) and pyrolusite (manganese dioxide). In addition, various filter manufacturers have developed their own proprietary coated media specifically for iron and manganese removal. Naturally occurring manganese greensand was available until recently, but is now cost prohibitive in North America.

The various combinations of chemical oxidants and filter media provide relative advantages and disadvantages with respect to:

- chemical oxidant cost
- chemical feed rate
- media cost
- allowable filter loading rate
- head loss through the filter
- filter run time before terminal headloss or breakthrough requires backwashing
- backwash rate and duration requirements

In order to evaluate the performance of various chemical oxidants and filter media for the removal of iron and manganese at Well No. 2, a pilot test will be conducted. The pilot test will simulate the operation of a full-scale oxidation/filtration treatment system at Well #2. The pilot test results will lead to the selection and sizing of the most cost-effective system for reliably reducing iron and manganese to acceptable levels. Perhaps the most

significant outcome of the pilot test will be the determination of whether detention and re-pumping facilities are necessary. Selection and sizing of the treatment system components will allow for the development of a reliable budgetary cost estimate for the water treatment improvements and the building to house the treatment system.

A *Report of Pilot Study for Iron and Manganese Removal at Village of Kronenwetter Well No. 2* will be prepared which includes:

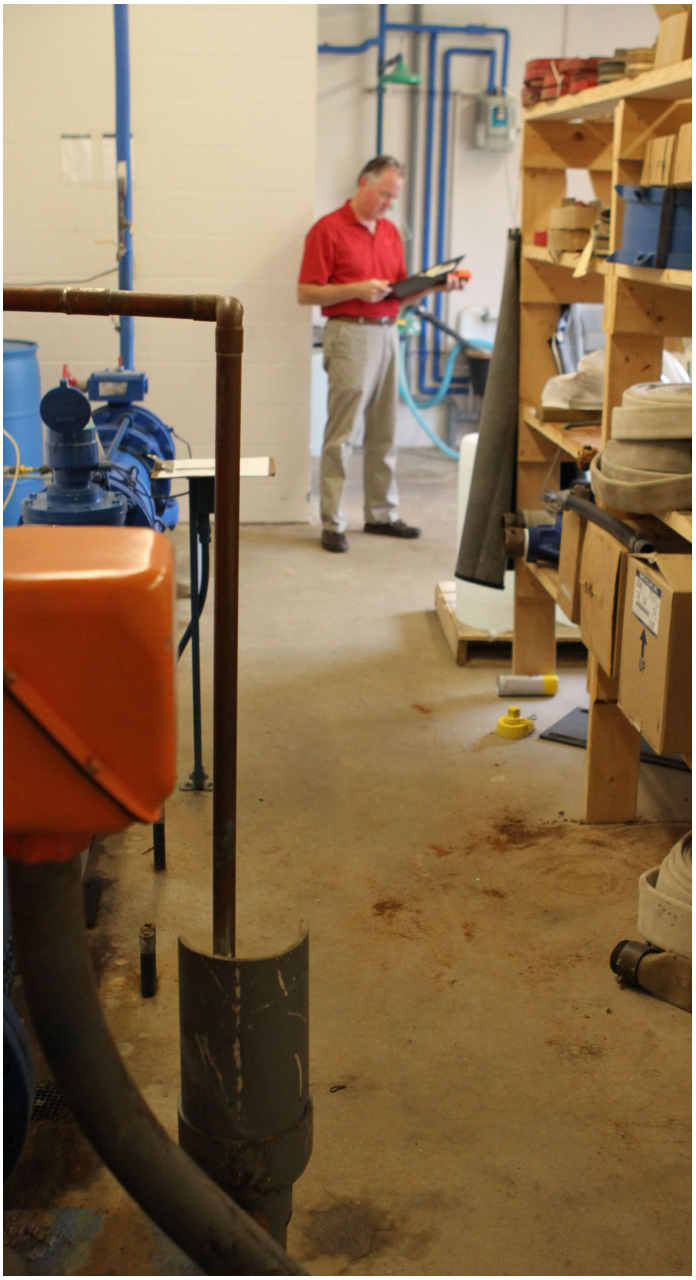
- the pilot test protocol and results
- a recommendation for most cost-effective water treatment facility to produce a finished water that is well within the U.S. EPA and DNR drinking water standards for iron and manganese
- a budgetary estimate of total capital cost and annual operational cost associated with the recommended water treatment system.

The *Report of Pilot Study* will also consider the impact of a future Well No. 3 that might also need treatment for iron and manganese removal at the same location as the treatment facilities for Well No. 2.

The *Report of Pilot Study* is discussed in more detail in the following Project Approach – Scope of Services section of this proposal.

The Request for Proposals for the pilot testing identifies a schedule in which the consultant will be selected on September 13, the pilot testing is to be performed in October, and the preliminary *Report of Pilot Study* is to be submitted by November 18, 2016. Recognizing that the pilot testing requires pre-approval by the Wisconsin DNR (see Wisconsin Administrative Code NR811.44) MSA has already submitted our plan for pilot testing to the DNR (as authorized by the Director of Public Works). This was done in order to ensure that the project can proceed on schedule, given the current long lead time for DNR review/approval, and is provided at no cost to the Village.

With the project schedule in mind, MSA has also, at our cost, collected a water sample from Well No. 2 for laboratory testing, to get a head start on determining the relative difficulty of treating the water from Well No. 2. Specifically, samples were tested for ammonia and total organic carbon concentrations. Ammonia in the water will typically create a high chlorine demand, making it difficult to oxidize iron and/or manganese. Ammonia can also prevent the formation of filterable precipitates. Fortunately, the sample collected from Well #2 had no detectable ammonia. The sample collected from Well #2 had a total organic carbon concentration of 2.0 mg/L. As a rule of thumb, concentrations of total organic carbon above 2 mg/L can be an indication that it may be difficult to oxidize and precipitate iron and (especially) manganese, as the naturally occurring organics can form metal complexes that delay the rate of oxidation and precipitation. The interferences caused by total organic carbon, however, are highly dependent on the forms of organic carbon present.



PROJECT APPROACH

PILOT TESTING PROVIDER

MSA has discussed the pilot testing needs at Well No. 2 in Kronenwetter with experts from three (3) manufacturers of water treatment equipment and obtained proposals from all three. We have incorporated their ideas into our proposed protocol for the pilot testing. The pricing obtained from the three water treatment equipment manufacturers was similar:

PILOT TEST DURATION

VENDOR	ONE-WEEK	TWO-WEEKS
Artesian of Pioneer (AOP)	none	$18,000
Tonka Water	$11,500	$16,000
WesTech Engineering	**$11,380**	**$14,480**

WesTech Pilot Plant

MSA selected the equipment manufacturer that we believe will provide the Village with the most comprehensive, thorough, and timely pilot testing for a reasonable fee.

For the pilot testing at Well No. 2 in Kronenwetter, MSA will team with **WesTech Engineering, Inc**. The potable water treatment division of WesTech is the former General Filter Company, based in Ames, Iowa, which WesTech purchased in January 2013. WesTech, especially as General Filter Company, has a long resume of successful projects in Wisconsin for iron and manganese removal and other potable water treatment processes, and has performed pilot testing as part of the initial phase of many of those projects. They have very experienced personnel and are very well equipped to perform the pilot testing at Well No. 2. The MSA project team has worked with WesTech on past projects for iron and manganese removal.

PILOT TESTING EQUIPMENT

Pilot testing will conducted in the WesTech trailer-mounted pilot plant. The pilot plant is equipped with:

1. pressure aerator
2. 180-gallon raw water feed tank
3. forward flow pumps (one for each filter column)
4. induced draft aerator
5. detention tanks
6. filter columns consisting of three (3) 6.75-inch diameter x 60” high clear shells
7. peristaltic chemical feed pumps
8. backwash pump
9. instrumentation, including isolation valves, flow meters, pressure transmitters, etc.
10. process control laboratory including HACH portable test kit.

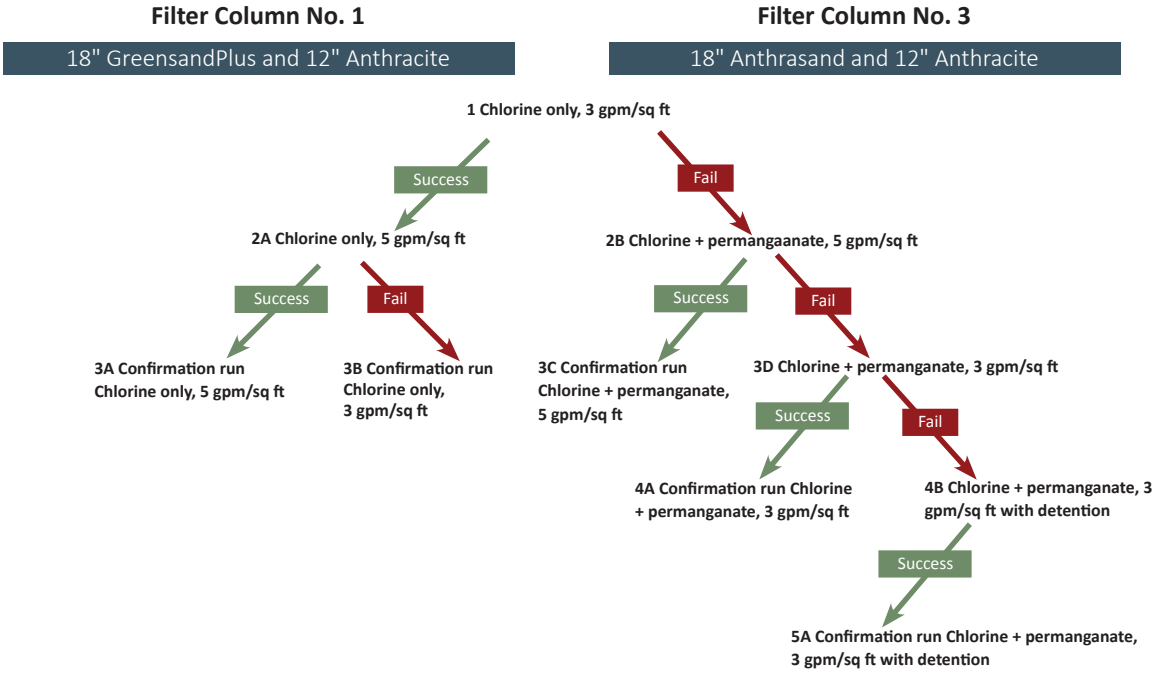
The pilot testing trailer will be parked in the Wellhouse No. 2 driveway, outside the double doors. An electrical connection will be required from the main disconnect switch on the pilot plant trailer and a 230-volt, 30 amp, single phase breaker in the wellhouse electrical lighting panel. A ¾-inch diameter hose connection is required between the well discharge pipe and the pilot plant trailer. A 1.5-inch waste drain connection at the pilot plant trailer will be utilized to route treated water and backwash water to either the ground surface or to a floor drain in the wellhouse. The Village has indicated that Well No.2 can be run for a minimum of eight hours per day and excess water can be discharged from an nearby hydrant.

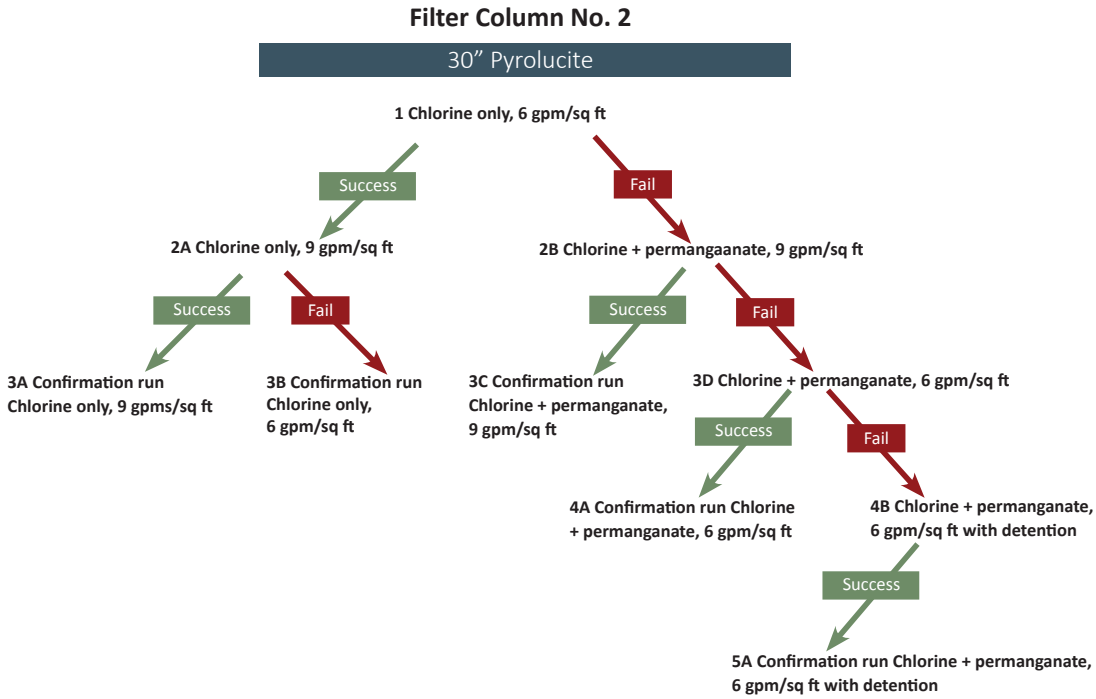
PILOT TESTING PROTOCOL

Three filter columns are proposed to be utilized for the pilot testing. The following figures illustrate the proposed pilot testing protocol in a “flow chart” format. On the flow charts, “success” implies an acceptably long filter run time before breakthrough of iron or manganese or before development of excess head loss through the filter. The protocol assumes neither sodium permanganate nor

detention are necessary. The first step in the pilot testing will be to conduct jar testing to get an indication whether a filterable floc can be achieved without sodium permanganate or detention. In the event that the initial filter runs do not achieve the desired results, permanganate and/or detention would be added later. Initially, chlorine alone will be used as the oxidant. The assumed initial filter loading rate is shown on the "flow chart" for each column. If the initial filter runs are successful, the pilot testing for any particular column (media) could be completed in as few as three filter runs, including a confirmation run for the recommended loading rate. This is feasible in a one-to two-week pilot test, even though "success" implies a long run time before terminal headloss or breakthrough are reached. If the initial filter runs are not successful, the pilot testing for any particular column (media) could take as many as five filter runs. But "failure" implies shorter run times, so it will be possible to complete the testing, especially in a two-week pilot test.

PROPOSED PILOT TESTING PROTOCOL





One filter column will contain 12 inches of anthracite above 18 inches of GreensandPlus™. GreensandPlus™ is by far the most widely used synthetic greensand for potable water treatment in the United States, and is commonly used for iron and manganese removal applications. A layer of anthracite is commonly used above the GreensandPlus™ as a "pre-filter" to extend filter run times.

A second filter column will contain 30 inches of pyrolusite. Pyrolusite is manganese dioxide, with a finer gradation than greensand. Pyrolusite use for iron and manganese has become fairly widespread in recent years. The potential advantage of pyrolusite is a high loading rate, which can reduce the size and cost of the filter and the building to house the filter. The disadvantages of pyrolusite include higher head loss through the filter, potentially shorter filter run times due to terminal headloss being reached sooner, and higher backwash flow and volume requirements.

A third filter column will contain 12 inches of anthracite above 18 inches of AnthraSand™, which is a proprietary manganese dioxide coated sand media developed by General Filter Company (WesTech). The advantages of AnthraSand™ are lower cost as compared to GreensandPlus™ and potentially longer filter runs due to coarser media. The disadvantage is that the media must be coated in-situ (within the filter tank after placement).

The Request for Proposals suggests the evaluation of ozone as an oxidant. MSA does not recommend the Village incur the cost for pilot testing with ozone unless more conventional oxidants (sodium hypochlorite, potassium permanganate) are not successful. The high cost for ozone generation equipment and ozone contactors indicates that ozone should only be considered if advanced oxidation process is required, and then perhaps in combination with hydrogen peroxide and/or ultraviolet light. Since it is very likely that sodium hypochlorite and/or sodium permanganate will successfully oxidize the iron and manganese at Well #2, the use of ozone in the pilot study is not included in this proposal.

Likewise, the Request for Proposals suggests the investigation of inorganic chemicals as aids to facilitate floc formation. Inorganic coagulants such as alum and ferric chloride are available to improve floc formation, however experience indicates that inorganic coagulants are rarely needed for floc formation in iron and manganese removal from groundwater, and are more typically used in surface water treatment or where it is desired to create adsorption sites for the removal of other contaminants such as arsenic. MSA does not recommend the Village incur the cost for pilot testing with inorganic coagulants unless conventional oxidants do not form a filterable floc. Organic polymers are also available as filter aids, but are not typically needed for the removal of iron and manganese. Given the limited time and budget available for pilot testing, it is not recommended that polymers be evaluated at this time. The pilot study could be extended at an additional cost, if it proves necessary to evaluate improvements to floc formation with inorganic coagulants or organic polymers.

SCOPE OF SERVICES

MSA will conduct a project kick-off meeting with Village and Marathon Technical Services (MTS) personnel to review the pilot testing plan and protocol, the schedule for the pilot testing, and items to be provided by the Village and/or MTS.

MSA will analyze data regarding well construction and water quality from Well No. 2, and the data of historic well water pumpage.

During pilot testing, MSA will visit the site on a daily basis to monitor the progress of the filter runs and discuss the results with WesTech's technician performing the tests, the Village, and MTS. MSA's Dan Borchardt lives in Kronenwetter, which allows for very efficient oversight of the pilot testing. Based on the test results obtained at that time, MSA may suggest changes to filter loading rates, oxidant feed rates, oxidant, and/or filter media for subsequent filter runs.

During pilot testing, the flow (loading) rate and pressure drop (head loss) through each filter column will be monitored. Iron and manganese concentrations will be monitored on site with a HACH® test kit and field test results will be verified with periodic split samples that are sent to the Northern Lake Service, Inc. laboratory for confirmation of the field results.

For each filter run, the oxidant type, oxidant dose, filter media, and filter loading rate will be noted. The filter run time will be noted when the filter run is terminated, which will be at the point of iron or manganese breakthrough or terminal headloss through the filter. The filter will be backwashed at the end of each filter run, at a rate (gpm per square foot of media) typical for the respective media type.

The following data will be measured/analyzed on site, at the start of each filter run, at intervals of approximately two hours during the filter run, and at the end of each filter run, for each filter column:

- Flow rate (filter loading rate)
- Influent and effluent pressure (filter head loss)
- Influent and effluent iron concentrations
- Influent and effluent manganese concentration
- Effluent chlorine concentration
- Influent and effluent temperature
- Influent and effluent turbidity

The following data will be measured/analyzed on site, once per day for each filter column:

- Influent and effluent color
- Influent and effluent alkalinity
- Influent and effluent hardness
- Influent and effluent pH

In addition, the following filter influent and effluent water samples will be collected at the start and end of each filter run, or a minimum on once per day, and analyzed by an outside laboratory, as a check of the on-site measurements:

- Iron
- Manganese
- Total organic carbon (raw water only)


Pilot Test Filter Columns

Based on discussions between MSA, the Village, and MTS, it is proposed that all laboratory testing be performed by Northern Lake Service, the Village's regular laboratory services provider. The costs for laboratory testing will be paid directly by the Village, avoiding any mark-up of this cost. Based on the assumed pilot testing protocol, the parameters to be tested in the lab, and the estimated number of samples to be tested in the lab, the estimated cost for laboratory testing is **$1,500.**

The Request for Proposals suggest that testing for monitoring for total trihalomethane potential (TTHMP) be provided. The TTHMP test is extremely expensive however, and since trihalomethanes (TTHM) are formed in the distribution system, the TTHMP test is only an indicator. The water produced by Wells No. 1 and 2 does not have a history of producing significant levels of trihalomethanes or haloacetic acids at the levels of chorine current added for disinfection. Since the amount of chlorine added will not change significantly for treatment of iron and manganese, the potential for TTHM production is not expected to increase significantly. The estimated cost shown above for laboratory testing does not include tests for TTHMP, however this testing can be added at the Village's request.

REPORT OF PILOT STUDY

A preliminary and final *Report of Pilot Study for Iron and Manganese Removal at Village of Kronenwetter Well No. 2* will be prepared, which will include:

- An executive summary of the pilot test findings and recommendations for design of a water treatment facility for iron and manganese removal.
- A narrative summary of the testing protocol, with respect to filter media, filter loading rate oxidant, oxidant dose.
- All of the results of water quality testing (field and laboratory), filter head loss over time, and other data collected during the study, in tabular and graphical form.
- An analysis of the data collected and recommendation for the most cost effective oxidant or combination of oxidants, oxidant dose rate(s), filter media, and filter loading rate.
- An estimate of the expected filter run time before bleed-though or terminal head loss.
- A determination of the size of filter and other treatment equipment required, for the well pumping capacity of 700 to 800 gallons per minute.
- An estimate of the flow rate and volume of backwash water produced, and recommendation for the number and volume of backwash water detention tanks to be provided.
- A preliminary floor plan for a building to house the new water treatment facilities.
- A budgetary cost estimate for the recommended treatment facilities, and building to house the treatment system, to include estimated equipment and construction costs; engineering design, bidding and construction administration fees, DNR submittals, PSC submittals, and funding applications/administration. MSA will obtain input from the Village regarding the desired building floor plan, exterior appearance, and materials of construction.
- An estimate of the annual operation and maintenance costs for the recommended water treatment facility. The O&M cost estimate will include chemical costs, energy costs, and labor.
- An implementation schedule for preliminary and final design, regulatory approvals, bidding, construction and start-up.

MSA will prepare a draft of the Report and meet with the Village to review the findings and conclusions of the pilot study. A final Report will be prepared which incorporates any Village comments and to include any laboratory results that may not have been available when the draft Report was written

DNR SAFE DRINKING WATER LOAN PROGRAM FUNDING ELIGIBILITY

To maintain the eligibility of the water treatment facility project for funding under the Wisconsin DNR Safe Drinking Water Loan Program (SDWLP) in the next State fiscal year, MSA will prepare and submit the Intent to Apply (ITA) form and Priority Evaluation and Ranking Form (PERF) for the project to DNR by October 31, 2016. MSA provided this service to the Village last year at no cost, and will continue this service at no cost this year.

DELIVERABLES

- Preliminary *Report of Pilot Study for Iron and Manganese Removal at Village of Kronenwetter Well No. 2*, in PDF format
- Twenty (20) paper color copies of final *Report of Pilot Study for Iron and Manganese Removal at Village of Kronenwetter Well No. 2* Report
- One (1) PDF copy of the final *Report of Pilot Study for Iron and Manganese Removal at Village of Kronenwetter Well No. 2* Report, including narrative, tables, charts, figures and appendices.
- Safe Drinking Water Loan Program ITA form and PERF submittal to Wisconsin DNR.

SCHEDULE

MSA will complete the project based on the schedule provided in the Request for Proposal.

TASK	COMPLETION DATE
Submit pilot testing plan/protocol to DNR for review and approval	August 22, 2016
Pilot testing completion	middle to late October 2016
Submit SDWLP ITA and PERF forms to DNR	October 31, 2016
Submit Preliminary Report to Village	November 18, 2016
Submit Final Report to Village	December 16, 2016

POTABLE WATER EXPERIENCE

Residents rely on municipalities for access to a clean, safe and reliable water supply system. MSA's water system experts excel at working with communities to study, design, build and maintain economical, long-lasting water supply infrastructure. We strive to develop systems that accommodate resource constraints while meeting current and future community requirements.

MSA's water-related expertise includes:

- Planning and comprehensive water system studies, including digital modeling
- Pilot Testing
- Design for groundwater wells, storage reservoirs, booster stations, and distribution systems
- Construction related services
- Funding – grant and loan applications and administration

Select lists of representative MSA projects for various potable water infrastructure are provided below:

WATER TREATMENT FOR IRON AND/OR MANGANESE REMOVAL

CLIENT	CAPACITY (GPM)
Village of Bangor, Wisconsin - Well #2	500
Village of Danvers, Illinois - Wells #1/#2	100
Village of Fairwater, Wisconsin - Well #1	500
Ho-Chunk Casino (Lake Delton, Wisconsin) - Well #1	1,600
Laona Sanitary District, Wisconsin - Well #1	400
Village of Milladore, Wisconsin - Wells #1/#2	75
Village of Necedah, Wisconsin - Wells #3/#4	750
City of Nekoosa, Wisconsin - Well #4	700
City of Pittsville, Wisconsin - Wells #4/#5	200
City of Pittsville, Wisconsin - Well #6	100
City of Sparta, Wisconsin - Well #10	1,000
Village of Stetsonville, Wisconsin - Well #1	500
Village of Stratford, Wisconsin – Well #9	500

GROUNDWATER WELLS

CLIENT	CAPACITY (GPM)
City of Adams, Wisconsin (3)	500 to 1,000
City of Baraboo, Wisconsin	1,000
City of Beaver Dam, Wisconsin	1,000
Village of Cottage Grove, Wisconsin	1,200
Village of DeForest, Wisconsin	1,500
City of Horicon, Wisconsin	1,200
Village of Lake Delton, Wisconsin (6)	450 to 1,000
City of Lodi, Wisconsin	1,000
City of Reedsburg, Wisconsin	1,100
City of Richland Center, Wisconsin (3)	750 to 1,000
City of Sparta, Wisconsin	1,000
Village of West Baraboo, Wisconsin	1,000
Village of Westfield, Wisconsin	1,000

WATER STORAGE RESERVOIRS

CLIENT	CAPACITY	TYPE
City of Adams, Wisconsin	400,000 gal.	Spheroid
City of Asbury, Iowa	500,000 gal.	Composite
City of Cottage Grove, Wisconsin	400,000 gal.	Spheroid
City of Duluth, Minnesota	1,000,000 gal.	Spheroid
City of Lake Delton, Wisconsin	400,000 and 750,000 gal.	Spheroid
City of Mount Zion, Illinois	1,000,000 gal.	Composite
City of Nekoosa, Wisconsin	600,000 gal.	Spheroid
City of Richland Center, Wisconsin	500,000 gal.	Standpipe
City of Sparta, Wisconsin	600,000 gal.	Spheroid
City of Two Harbors, Minnesota	1,250,000 gal.	Spheroid

WATER BOOSTER STATIONS

CLIENT	CAPACITY (GPM)	LOCATION
City of Baraboo, Wisconsin	2,500	Westside Business Park
City of Duluth, Minnesota	3,000	Arlington
	3,000	West Duluth
	2,200	Highland
City of Beaver Dam, Wisconsin	900	Highway 151
City of Elroy, Wisconsin	1,000	Grove Street
Village of Lake Delton, Wisconsin	2,000	Westside
	2,000	Eastside
	1,000	Bunker Road
City of Lake Elmo, Minnesota	1,250	Inwood Avenue

TEAM SUMMARY

For the Kronenwetter Well No. 2 Pilot study for iron and manganese removal, MSA has assembled a team of experienced water supply engineers who have worked together and separately on similar projects. Their understanding of the issues associated with iron and manganese removal from water supplies, and past experience with pilot testing to identify cost-effective solutions, will ensure that the goals of the pilot study are met in an efficient and timely manner. Each of the team members has the availability to compete the project within the timeframe described in the Request for Proposals.

Project Manager : Michael Voss, PE

Mike is located in the MSA-Marshfield office and will direct and review the efforts of the project team. He will provide coordination between MSA, the pilot testing provider (WesTech), the Village, Marathon Technical Services (MTS), and the Wisconsin Department of Natural Resources. Mike will be responsible for ensuring that the requirements of the project, as identified in the Request for Proposal, are met.

Senior Project Engineer: Daniel Greve, PE

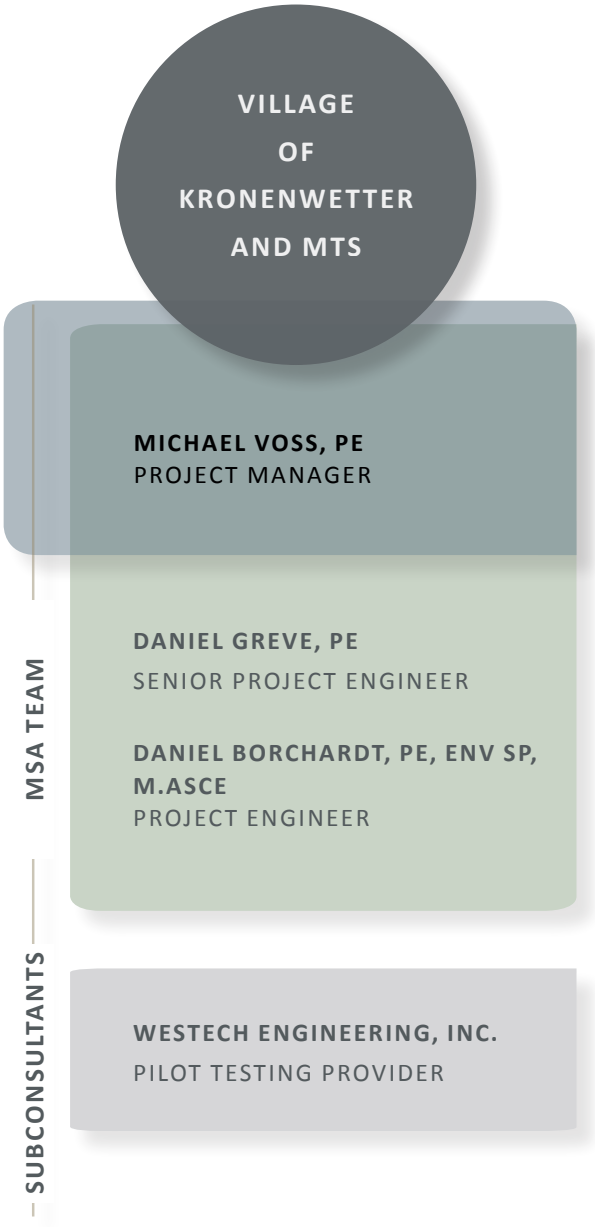
Dan is located in the MSA-Baraboo office. He developed the proposed protocol for the pilot testing at Kronenwetter Well #2 as described in this proposal, and will provide quality control/quality assurance (QA/QC) for the implementation of the pilot test. He will review of the pilot test data, the recommendations for design parameters associated with the full-scale treatment facilities, the cost estimate for the full-scale facilities, and all other aspects of the *Report of Pilot Study for Iron and Manganese Removal* as prepared by MSA.

Project Engineer: Daniel Borchardt, PE, ENV SP, M.ASCE

As a resident of Kronenwetter, Dan will provide for the efficient daily observation of the pilot testing as it progresses, review the data on-site, and consult with the WesTech technician on-site with regard to potential changes to the testing protocol during the course of the work. He will be the primary author of the *Report of Pilot Study for Iron and Manganese Removal* which will summarize the pilot test protocol and results, recommend the treatment facilities for the full-scale iron and manganese removal system, and establish a budgetary estimate of capital and operational costs associated with the full-scale system.

WesTech Engineering, Inc.

The potable water treatment division of WesTech is the former General Filter Company, based in Ames Iowa and founded in 1935. The company is an industry leader for all varieties of manufactured water treatment equipment including pressure filters and aerators. WesTech/General Filter has a long resume of successful projects in Wisconsin for iron and manganese removal, and has performed pilot testing as part of the initial phase of many of those projects. WesTech will be furnishing a pilot plant trailer containing equipment and a technician to conduct the pilot testing for iron and manganese removal at Well No. 2.



Michael Voss, PE

Project Manager

Mr Voss has 21 years of experience assisting communities in Wisconsin meet and fund their infrastructure needs. His experience includes the design and construction of water treatment facilities, wells, wastewater treatment facilities, sewage lift stations, water distribution facilities and wastewater collection facilities.

EDUCATION

M.S., Civil Engineering
University of Minnesota

B.S., Fisheries
University of Minnesota

REGISTRATION

Professional Engineer, WI

AREAS OF EXPERTISE

- Municipal Water System Engineering
- Municipal Wastewater System Engineering
- Municipal Stormwater Engineering
- DNR Permit Application
- Construction Management
- Materials Inspection
- Report Preparation
- State and Federal Grant and Loan Applications

SELECTED PROJECT EXPERIENCE

Wells No. 4 & No. 5 Treatment Facility, Pittsville, WI

Design engineer for the replacement and expansion of the iron and manganese filter plant serving Wells No. 4 and 5. In particular, managed the pilot study to determine the most cost efficient means to remove iron and manganese from the raw water. Used the results of the pilot study to size a pressure filter and oxidant contact chamber to ensure consistent iron and manganese removal. The project included a forced draft aerator, high lift pumps, chemical feed equipment, well pumps, SCADA, controls, concrete tankage, and water treatment facility building. This project was funded through the WDNR Safe Drinking Water Loan Program and Wisconsin Department of Commerce Community Development Block Grant Program (CDBG).

Well 9 Water Treatment Facility, Stratford, WI

Design engineer for Well No. 9 construction and associated treatment facility. Project included pilot testing to determine the design parameters for iron and manganese filtration equipment, gravity filtration, forced draft aerator, chemical feed equipment, SCADA, high lift pumps, controls, raw water transmission main, wastewater forcemain, and treatment facility building. This project was funded using WDNR Safe Drinking Water Loan Program and Wisconsin Department of Commerce Community Development Block Grant Program (CDBG).

Colby Well No. 13 and Water Treatment Facility Update, Colby, WI

Project manager for the design and construction of Well No. 13 and upgrade of the existing Well No. 2 water treatment facility. The aging plant required rehabilitation of the existing greensand pressure filter and softener. The original design provided no chemical contact time to allow for oxidation of iron. With the addition of Well No. 13 the iron concentration of the bended water increased requiring sizing and installation of a chemical contact tank. In addition, the project included Well design and construction, raw water transmission main, SCADA upgrades, controls, new brine storage tank, and HVAC upgrades. This project was funded using WDNR Safe Drinking Water Loan Program and Wisconsin Department of Commerce Community Development Block Grant Program (CDBG).

Daniel Greve, PE

Senior Project Engineer

Mr. Greve manages water, wastewater and other municipal infrastructure system improvement projects. He directs project teams through planning, design and construction for these projects, and is responsible for managing of various technical and financial aspects required for success of the project. These projects have included the development of new municipal water systems in several small communities. He also assists communities in obtaining grants and loans to finance municipal water projects.

EDUCATION

M.S., Environmental Engineering
University of North Carolina - Chapel Hill

B.S., Civil & Environmental Engineering
University of Wisconsin - Madison

REGISTRATION

Professional Engineer, WI

AREAS OF EXPERTISE

- Water Supply Treatment and Storage Planning, and Design
- Water Distribution System Analysis, Planning, and Design
- Municipal Wastewater Treatment Facilities Planning, and Design
- Wastewater Collection System Planning, and Design

SELECTED PROJECT EXPERIENCE

Pilot Testing and Iron/Manganese Removal Facilities, Necedah, WI

Served as Project Manager for water treatment facility improvements at Wells No.3 and No.4. Developed protocol for pilot testing, solicited proposals for pilot testing from equipment manufacturers, oversaw pilot testing and evaluated data. Based on the results of the pilot testing identified design parameter for the full scale treatment facilities. Managed design, bidding and construction-related services for the project as provided by MSA Professional Services, Inc. The treatment facilities have a capacity of 750 gallons per minute and provide iron and manganese removal via chemical oxidation and greensand filtration, with the equipment housed in a new building adjacent to Wellhouse No. 3. Instrumental in the application and administration of grants totaling $1,202,000 and a low-interest loan of $702,000 from the Wisconsin DNR Safe Drinking Water Program and the Wisconsin Department of Administration Community Development Block Grant for Public Facilities Program.

Pilot Testing and Iron/Manganese/Arsenic Removal Facilities, Danvers, WI

Served as Senior Project Engineer for pilot testing, planning, and grant application associated with new water treatment facilities for iron, manganese, and arsenic removal at Wells No. 1 and No. 2. Provided engineering and quality control/ quality assurance for the design and regulatory agency approvals of the new treatment facilities, which include forced draft aeration, chemical oxidation, arsenic removal via enhanced coagulation with ferric chloride, flocculation, detention time, and gravity filtration with greensand media. The project also included high lift pumps to deliver water to the distribution system through cation exchange softening vessels and buried backwash detention tanks. The treatment equipment is housed in a new building adjacent to the old water treatment plant.

Daniel Borchardt, PE, ENV SP, M.ASCE

Project Engineer

Mr. Borchardt's professional experience as a project engineer, design engineer and field engineer on several transportation, utility and construction projects has amplified his practical knowledge and leadership qualities necessary to help a project reach completion. His responsibilities include managing, design, project development. This experience will ensure that all aspects of a project are thoroughly encompassed. Mr. Borchardt's education, proficient skill level and experience in transportation and municipal engineering are a valuable contribution to our project team.

EDUCATION

B.S., Civil Engineering
University of Wisconsin - Platteville

REGISTRATION

Professional Engineer, WI

CERTIFICATIONS

Envision Sustainability Professional

AREAS OF EXPERTISE

- Project Management
- Roadway Design
- Utility Design
- Construction Management
- Construction Inspection
- Construction Staking
- Topographic Surveying

REFERENCE

Chad Ziegler
Rome Water Utility Superintendent
(715) 572-4871

SELECTED PROJECT EXPERIENCE

Water Treatment Improvements, Rome, WI*

The project included a 1.2 million dollar high capacity municipal Well #4, Wellhouse #4 and Water Treatment Plant. Dan's responsibilities included pilot testing with WesTech preliminary design, final design, construction inspection and project management with both Wellhouse #4 and 650 GPM Water Treatment Plant building layout, pump design, water piping and processes associated with the water treatment process. The duties as the construction project manager included administering project meetings and serving as the prime contact for quality control and construction related problems. Developed project specifications, bidding documents, estimates and obtained all regulatory agency approvals. The system will provide an improved quality of water to 1,200 users.

Correctional Institution Water System Improvements, Fox Lake Correctional Institution, WI *

The 1.7 million dollar project includes a high capacity well, watermain piping, reservoir and booster station. Dan performed plan review and developed quantity/cost estimates, wrote an engineering report and submitted permit applications for agency approval. Dan was the prime contact engineer for the contractor and Department of State Facilities. As the construction project manager Dan administered bi-weekly progress meetings and inspected construction as quality control.

**Denotes experience prior to MSA.*

PILOT TESTING AND IRON/MANGANESE REMOVAL FACILITIES -WELLS NO. 3 AND NO. 4

Village of Necedah, Wisconsin

The two municipal wells serving the Village of Necedah are Wells No. 3 and No. 4. Both wells are shallow screened wells that draw water from the sand-and-gravel aquifer, and are located approximately 700 feet apart. The two wells are each capable of producing approximately 750 gallons per minute, with pumping rate controlled by a variable frequency drive. Increasing concentrations of iron and manganese in both wells were resulting in customer complaints. The local ethanol plant, which purchases approximately 80% of the water used (averaging 400 gpm), requires water with a low iron and manganese concentration.

REFERENCE INFO

Roger Herried, Village Administrator
(608) 565-2261 ext. 2
necedahadmin@necedah.us
Date of Completion: 2013

MSA developed a protocol for pilot testing at Wells No. 3 and No. 4 simultaneously and independently, to verify the effectiveness of oxidation/filtration and to determine the most cost-effective combination of oxidant, chemical feed rate, media, and filter loading rate. Wells No. 3 and No. 4 were pilot tested over a two-week period. The pilot study determined that permanganate feed and detention were not necessary for effective removal of iron and manganese at either well. The results of the pilot study were utilized as design parameters for the full scale treatment facility.

MSA designed the new treatment facilities, which are housed in a new building adjacent to Wellhouse No. 3 to treat the water from both wells. The facilities include oxidation with sodium hypochlorite and direct filtration with GreensandPlus™ media through a 26-foot-long x 10-foot diameter four-cell horizontal pressure tank. The filter is provided with simultaneous air-water backwash. The new building contains a chemical feed room with separate chemical feed systems dedicated to each well. Two buried precast concrete detention tanks are provided to control the rate of backwash flow to the sanitary sewer system.

The project, which also included approximately 4,300 feet of 12-inch diameter water transmission main, standby power for both wells and the treatment facility, a new supervisory control and data acquisition (SCADA) system for the Water Utility, and three blocks of road reconstruction and water main, was constructed at a cost of $1,904,000 million. MSA provided funding assistance to the Village, including the applications for, and administration of, a $702,000 grant and $702,000 loan from the DNR Safe Drinking Water Loan

Installation of horizontal pressure filter

Pilot study filter columns

Four-cell horizontal pressure filter and facepiping

PILOT TESTING AND IRON/MANGANESE REMOVAL FACILITIES – WELLS #4 AND #5

City of Pittsville, Wisconsin

The City of Pittsville relied on three wells to supply water to its water customers. All three wells produced water containing manganese and iron concentrations that exceeded secondary limits for both metals. The outdated filter plant serving Wells #4 and #5 had limited capacity and could only treat water from one well at a time. The major industry in Pittsville was expanding. It is a wet industry that requires water to produce its product. To meet the increased water demand of the expanded facility, Pittsville needed to operate Wells #4 and #5 simultaneously. The City turned to MSA to solve the problem.

REFERENCE INFO

Paul Veldman, Director of Utilities
City of Pittsville
(715) 213-0471
pittswrandsr@tds.net
Date of Completion: 2009

Experience with the outdated water filter plant at Well #4 indicated that something in the water chemistry was interfering with oxidation of the iron and manganese. MSA hired a water treatment manufacturer to conduct pilot testing to determine the most efficient and cost effective means to remove the metals from the finish water. MSA designed a protocol for the pilot study that included an investigation of the effect of pre-aeration on oxidant demand, and the effect of chlorine and permanganate as oxidants. The protocol also looked at the contact time required to provide reliable oxidation of the iron and manganese prior to filtration.

Based on the findings of the pilot study, MSA designed a greensand pressure filter system that relied on pre-aeration, chlorine and permanganate to oxidize iron and manganese. The detention time of the treatment facility was expanded to two hours to make sure there was complete oxidation of the metals. MSA's design took into account the addition of future wells. This plant has been successfully removing iron and manganese for seven years. In fact, this treatment facility is now successfully treating water from three additional wells.

Water Treatment Facility with two hour concrete detention tank and aerator

Pressure filter under construction

Pittsville Water Treatment Facility

PILOT TESTING AND IRON/MANGANESE/ARSENIC REMOVAL FACILITIES – WELLS #1 AND #2

Village of Danvers, Illinois

The municipal Wells #1 and #2 serving the Village of Danvers produce water containing elevated concentrations of iron, manganese and arsenic. The two wells pumped to a common water treatment facility, which included equipment for aeration, chemical oxidation, and ion exchange softening. The treatment equipment was old and only marginally effective for iron and manganese removal, and was not designed for arsenic removal. As a result, the treated water at Danvers consistently exceeded the primary U.S. EPA Maximum Contaminant Level (MCL) of 0.010 mg/L for arsenic.

The U.S. EPA issued an Administrative Order to the Village of Danvers that required the Village to address non-compliance with the arsenic levels in the finished potable water. Anticipating the issuance of the Administrative Order, MSA recommended that the Village proceed with planning for a water treatment facility upgrade, beginning with a pilot study to confirm the effectiveness of the proposed treatment facilities for the removal of iron, manganese, and arsenic. In addition to the challenge of achieving an extremely low concentration of arsenic in the finished water, the treatment of the water from Wells #1 and #2 at Danvers is complicated by the presence of ammonia and total organic carbon.

MSA identified a proposed treatment process consisting of aeration, chemical oxidation with sodium permanganate, co-precipitation and adsorption with ferric chloride, flocculation, detention time, settling, and greensand filtration. Pilot testing was performed to evaluate the effectiveness of the recommended chemical oxidants, ferric chloride, chemical dosing rates, detention time, filter media and filter loading rate, for iron, manganese, and arsenic removal.

The pilot testing confirmed the effectiveness of the proposed treatment process, provided information for the design of the full-scale system, and gave the Village the confidence to move forward with final design and construction of the new facilities. The new treatment plant was placed into service and has consistently achieved finished water arsenic concentrations of 0.005-0.007 mg/L.

The project included a new building, adjacent to the existing water treatment plant, to house the new treatment facilities and new high-lift pumps. Upgrades were also made to the existing ion exchange softening equipment at the existing plant. The total project cost for the improvements was approximately $3.5 million. MSA assisted the Village in obtaining a low-interest loan through the State Revolving Fund loan program.

REFERENCE INFO	
Tom Caisley, Mayor	*Chris Siscoe, Operator*
Village of Danvers	*Village of Danvers*
(309) 846- 3559	*(309) 261-3315*
tomcaisley.danvers@gmail.com	*vodwater@frontier.com*

Date of Completion: 2015

Treatment Tank: Flocculation, Detention, and Gravity Filtration

New Water Treatment Building

FEES

MSA Professional Services, Inc. (MSA) will complete the Pilot Study for Iron and Manganese Removal at Kronenwetter Well No. 2, as outlined in this proposal, for a lump sum fee of $8,250. This fee does not include equipment and labor for the on-site pilot testing or laboratory work.

For the pilot testing at Well No. 2, **WesTech Engineering, Inc.** WesTech will provide a trailer-mounted pilot plant and a technician to perform the pilot testing as described in this proposal. WesTech will complete the pilot testing for a lump sum fee of $11,380 for a one week (5 day) study or $14,480 for a two week (10 day) study. The WesTech proposal to MSA for their pilot testing services is included as Appendix A of this proposal. MSA recommends that the Village plan for a pilot test of two-week duration, in order to help ensure that sufficient data is collected to evaluate a various combinations of oxidants, filter loading rates, and detention time as may be necessary.

It is proposed that laboratory testing be provided to confirm the results of on-site iron and manganese monitoring, and for total organic carbon. Based on the pilot testing protocol described in this report, the estimated total number of samples to be tested in the lab for each parameter, during a two-week pilot test, is shown below. The number/frequency of laboratory tests will be discussed with the Village and MTS at the project kick-off meeting, and can be adjusted at the Village's request.

PARAMETER	EST. NO. OF TEST (2 WEEK PILOT)
Iron	30
Manganese	30
Total Organic Carbon	8

Based on discussions between MSA, the Village and MTS, it is proposed that the costs for laboratory testing be paid directly by the Village, avoiding any mark-up of this cost. It is recommended that laboratory testing be performed by **Northern Lake Service, Inc.**, the Village's regular laboratory services provider. Based on the likely total number of samples shown above, the estimated cost for laboratory testing is $750 for a two-week pilot test and $1500 for a one-week pilot test.

In summary, the proposed fees for the Pilot Study for Iron and Manganese Removal at Kronenwetter Well No. 2 are as follows:

	PILOT TEST DURATION	
FIRM	ONE WEEK	TWO WEEKS
MSA Professional Services, Inc.	$8,250	$8,250
WesTech Engineering, Inc.	$11,380	$14,880
Total Lump Sum Fee	**$19,630**	**$23,130**
Laboratory Testing (estimated)	$750	$1,500

APPENDIX A:

WESTECH ENGINEERING, INC. PROPOSAL FOR PILOT TESTING AT KRONENWETTER WELL NO. 2

Kronenwetter Well #2

Wisconsin

Represented by
Tom Dennis
Drydon Equipment, Inc.
Hilbert, Wisconsin
(920) 439-1188
tdennis@drydon.com

Furnished by
Tom Dumbaugh
tdumbaugh@westech-inc.com

Scope and Pricing

Pilot and Rental Equipment

Summary

We are pleased to offer the following information on a fully staffed pilot study for iron and manganese removal at Kronenwetter, WI Well #2. This proposal is for a five-day study utilizing our pilot plant 19C staffed by a WesTech field process engineer. Additional days can be added to the study at a cost of $700 per day. The total for a 10-day study would be $14,880. The system is currently available for shipment in four weeks, and can be reserved upon written notice to proceed.

This proposal consists of a standalone WesTech pilot that will be supplied with pumps, instrumentation, valves, cleaning system, and other necessary components. Interconnecting piping, valves, pumps, and instruments are not included and will need to be supplied by others (some items may be available through WesTech for an additional charge). See attached technical data sheet for a description of the actual pilot unit including size, weight, connection details, flow rates, and pictures of the equipment.

The pilot unit is available for a One week Pilot Study for a fee of $11,380. This includes the costs to rent the unit, unit prep, and round trip freight as well as a WesTech field process technician to assist with set up and teardown and to operate the pilot unit for the duration of the pilot period. A pilot study report will be issued approximately four weeks after receipt of all testing data. The pilot/rental period can be extended for $700 per day. Charges for extending the Pilot Study will be invoiced monthly for the duration of the Pilot Study.

Pilot unit prep as well as freight to and from the job-site will be $5,940 and will be invoiced upon shipment of the unit to site. The remaining $5440 will be invoiced at the conclusion of the pilot/rental period. Customer is responsible for unloading, set-up, tear-down, and loading of equipment at site.

General Operation

The Pilot Plant 19C trailer includes capabilities for aeration, detention, and filtration with up to three separate filter columns. The 19C enclosed pilot plant tests the effectiveness of oxidation/gas stripping by pressure or positive draft aeration, detention, and filtration. Common contaminates removed include: Fe, Mn, Ra, CO_2, H_2S, As, TOC, VOC, Color, Odor, etc.

Goals of the Study

WesTech will be happy to assist the customer in developing a detailed protocol. Typical factors to consider are:

- Influent & Treated water qualities
- Determine removal percentages of process
- Determine/optimize chemical feeds to meet the pilot study objectives
    - Chemical dosing rate(s)
    - Chemical usage
- Determine/optimize operational parameters to meet the pilot study objectives.
- Determine net process production
    - Filter head loss rate
    - Total treated water volume
    - Filter run length
    - Backwash waste volume

Typical Two Week Pilot Schedule

Week 1

- Monday – Unit arrives on-site and Customer begins process/electrical terminations, WesTech Process Engineer travels to Site.
- Tuesday – Set up/commissioning.
- Wednesday –Optimization.
- Thursday – Optimization.
- Friday – Start Performance Run 1.
- Saturday – Performance Run 2.
- Sunday – Performance Run 3.
- Monday – Performance Run 4.
- Tuesday – Performance Run 5 (multi-day).
- Wednesday – Performance Run 5 (multi-day).
- Thursday – End Runs, Begin Decommissioning.
- Friday – Finalize Decommissioning, Unit Shipped to Ames, Process Engineer Travels.

Performance runs may be conducted to terminal headloss resulting in fewer total runs but demonstrating performance over the entire filter cycle.

Pilot Accessories

None requested for this study.

Site Requirements

Customer to Provide:

- Safe and secure location
- Access to pilot site
- Housing and protection for pilot equipment
- Offloading/loading of equipment, including forklift, crane/rigger, docking etc. (if needed)
- Placement of equipment on hard level surface
- Discharge line from pilot to waste location; sanitary, backwash waste pit, etc.
- All regulatory permitting (if required) for source water and discharge
- Any third-party laboratory testing required (or WesTech can provide for additional fee)
- Local Code compliant inspection of equipment and installation

Customer will supply licensed electrician and plumbing services for interconnecting piping and system hookup to power source, and water source and discharge.

Field Service

Westech has included the cost of a Field Process Engineer to assist with set-up of the equipment, operate the pilot unit, and assist with decommissioning and packing the equipment. Additional field services are available for $700 per day.

Pricing

Pilot Unit Prep & Round-Trip Freight		$5,940.00
Additional To Be Invoiced*		$5,440.00
	TOTAL	**$11,380**

(*If pilot/rental period is more than four weeks, this amount will be prorated and invoiced monthly, otherwise it will be invoiced as a lump sum at the end of the pilot/rental period.)

WesTech Engineering, Inc. Trial & Pilot Equipment

Rental Agreement

TERMS AND CONDITIONS:

1. The charges for the Pilot Study shall be **$5,940 upon** shipment and **$5440 will be invoiced at the conclusion of the pilot/rental period.** If pilot is extended, it will be at $700 per day, invoiced monthly. Unnecessary damage will be the responsibility of the Lessee. The rental shall begin upon shipment of the equipment from our plant and shall continue until the date of shipment from your plant; copy of the shipping manifest is to be submitted to WesTech Engineering Inc. as proof of shipment.

2. Minimum rental period is one (1) week. Long term rental agreements (greater than 6 months) are available.

3. Fractional monthly rental charges in excess of one (1) month are prorated on a weekly basis.

4. Invoices are rendered monthly with lease charges payable in advance. Terms on all invoices shall be net 30 days.

5. F.O.B. point is Ames, Iowa.

6. Title to rented equipment shall remain in the name of WesTech Engineering, Inc. unless equipment is purchased and full payment is made for same.

7. The Lessee shall, at his own expense, carry necessary insurance to protect Lessor and Lessee against all risks to the equipment or any liability arising from the use of said equipment while the equipment is in the possession and control of the Lessee.

8. The Lessee shall, at his own expense, maintain and replace any normally wearing parts required during the term of the lease.

9. The above rental price is firm for thirty (30) days. All local, state, Federal, sales, or manufacturer's taxes of any sort, and such taxes and/or charges pertaining there-to are to be borne by the Lessee.

10. No professional liability insurance is provided. As an equipment lessor/supplier, WesTech maintains general liability insurance for this purpose, as our professional services are incorporated in the supply of the equipment.

11. Lessor shall not be liable for claims, demands, or causes of action arising solely out of lessee's acts or omissions. WesTech shall indemnify for any negligent acts or omissions of its employees, agents, and subcontractors. In the event that any such injury, including death or damage is caused by the joint or concurring negligence of Lessee and WesTech, the loss or liability shall be borne by Lessee and WesTech in proportion to each party's negligence.

INSTALLATION:

The Lessee agrees to install the equipment according to our instruction and Operation and Maintenance Manuals and to furnish all necessary labor. All piping and wiring connections are to be made by the Purchaser in accordance with our instructions.

MAINTENANCE:
The Lessee is required to provide adequate supervision, maintenance, repairs, grease and oil, etc., as may be necessary or required by our Operation and Maintenance Manual.

FIELD SERVICE:
Additional field services beyond those quoted can be purchased for $700 per day.

TEST PROGRAM AND RESULTS:
All test, operation, sampling, maintenance, installation and other labor are part of the Lessee's cost and responsibility unless otherwise agreed upon. All party's access to the test program results will be discussed and agreed upon at the execution of this contact.

WesTech Engineering will be pleased to review and evaluate the results of the test program with the Lessee (purchaser) with respect to design and specification of full scale equipment.

RENTAL RETURN:
Upon return of the equipment, we reserve the right to invoice for major repairs, other than normal wear, and for any cleaning cost necessary to return the equipment to the condition at which it was received at the Lessee's plant. To avoid unnecessary cleaning charges, we ask that the Lessee make sure that the unit is cleaned and functional before returning it.

Accepted by:

WesTech Engineering, Inc.
3665 S West Temple St
Salt Lake City UT 84115

By: _____	By: _____
(name)	
_____	_____
(title)	Name
_____	_____
WesTech Engineering	Title

WESTECH

Pilot Plant 19C Technical Information

Type of Treatment:	Aeration, Detention and Filtration
Plant Flow Rate (Per Column):	Variable 0.5 - 5 GPM 0.6 GPM @ 3 GPM/SQFT rise rate 0.8 GPM @ 4 GPM/SQFT rise rate 1.0 GPM @ 5 GPM/SQFT rise rate

Pressure Aerator

Type:	GFC Atomerator
Flow Rate:	1-5 gpm
Size:	5 1/2” dia. x 8 1/2”
Compressor:	1 hp, 110 v, 1 ph, 60 hz
Control: Manual	
Accessories:	Air pressure regulator, needle valve and air flow rotometer, cap. 0.8 SCFH
Air Release System:	Manual Valve ¾”

Induced Draft Aerator

Type:	Induced Draft
Flow Rate:	1-5 gpm (flow control float valve)
Size:	4" diameter x 60" high (1 section)
Cross section area:	0.08 sq. ft.
Internals:	Loose Fill
Mounting:	Side of trailer
Size connections:	3/4" garden hose
Blower:	6” Fantech, plastic centrifugal in-line duct fan
Flow Rate Control:	Float valve on aerator influent balances inlet rate to detention tank with pumping rate.

WESTECH

Detention Tanks

Minimum Number of Tanks: 1

Maximum Number of Tanks: 3

Tank Dimensions (each Tank): 8" wide x 24" long x 30" deep (adjustable water level)

Detention Times (minutes):

	Loading Rate; gpm/sq.ft									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
(1) Filter Q gpm	0.20	0.40	0.59	0.79	0.99	1.19	1.39	1.58	1.78	1.98
(2) Filters Q gpm	0.40	0.79	1.19	1.58	1.98	2.38	2.77	3.17	3.56	3.96
(3) Filters Q gpm	0.59	1.19	1.78	2.38	2.97	3.56	4.16	4.75	5.35	5.94
Single DT Tank										
(1) Filter DT min	105	53	35	26	21	18	15	13	12	11
(2) Filters DT min	53	26	18	13	11	9	8	7	6	5
(3) Filters DT min	35	18	12	9	7	6	5	4	4	4
Two DT Tanks										
(1) Filter DT min	210	105	70	53	42	35	30	26	23	21
(2) Filters DT min	105	53	35	26	21	18	15	13	12	11
(3) Filters DT min	70	35	23	18	14	12	10	9	8	7
Three DT Tanks										
(1) Filter DT min	316	158	105	79	63	53	45	39	35	32
(2) Filters DT min	158	79	53	39	32	26	23	20	18	16
(3) Filters DT min	105	53	35	26	21	18	15	13	12	11

Filter Tanks

Number of Units: Three

Type: Vertical Pressure Filters

Diameter: 6 3/4" O.D.

Shell Height: 60"

Bed Area: 0.20 sqft.

Pipe Size: 1/2"

Underdrain: 614 Media Retaining Nozzle

Filter Media: Based upon full scale design

WESTECH

Instrumentation

Filter Rate Control:	Proportioning Ball valve & Siemens flow meter
Filter Loss of Head Gauge:	3 – Siemens Differential Pressure Transmitters
Feed and Backwash Flow:	3 – Siemens ½" Magnetic Flow Meters
Turbidity:	1 – Hach 1720E Turbidimeter
Process Control Laboratory:	Capability of performing portable Hach tests (optional)

Chemical Feeders

Number:	3 – Stenner peristaltic pump
Chemicals which can be fed:	Caustic soda, soda ash, hypochlorite, alum, coagulant aid, potassium permanganate, dilute slurries if held in suspension with constant mixing
Capacity:	0 to 40 GPD each
Chemical Containers:	3 - 15 gal. plastic tanks with mixers
Mixer Motors:	3 – 1.1 amps, 1/15 hp, 120 VAC, 1 ph
Accessories:	Connecting tubing, solution tank, and calibration columns
Points of Application:	Aerator effluent, detention tank, filter connections

Control Panel — manual switches

Service & Backwash Pumps

Feed Pumps:	3 – G & L Model NPE Series 1x1.25x6
Power:	1/2 hp, 230 v, 1 ph, 60 hz
Capacity:	Approx. 5 gpm
Backwash Pump:	1 – Goulds ½ HP Stainless Sump Pump
Backwash Capacity:	Approx 5 gpm

WESTECH

Pilot Site Requirements

Level Surface:	10’ x 20’ Minimum Level Area Required
Raw water connection:	¾” Garden Hose Connection @ ~ 20 psi supplied by customer.
Potable/tap water connection:	Garden hose connection supplied by customer.
Drain/waste location:	Below grade for gravity flow.

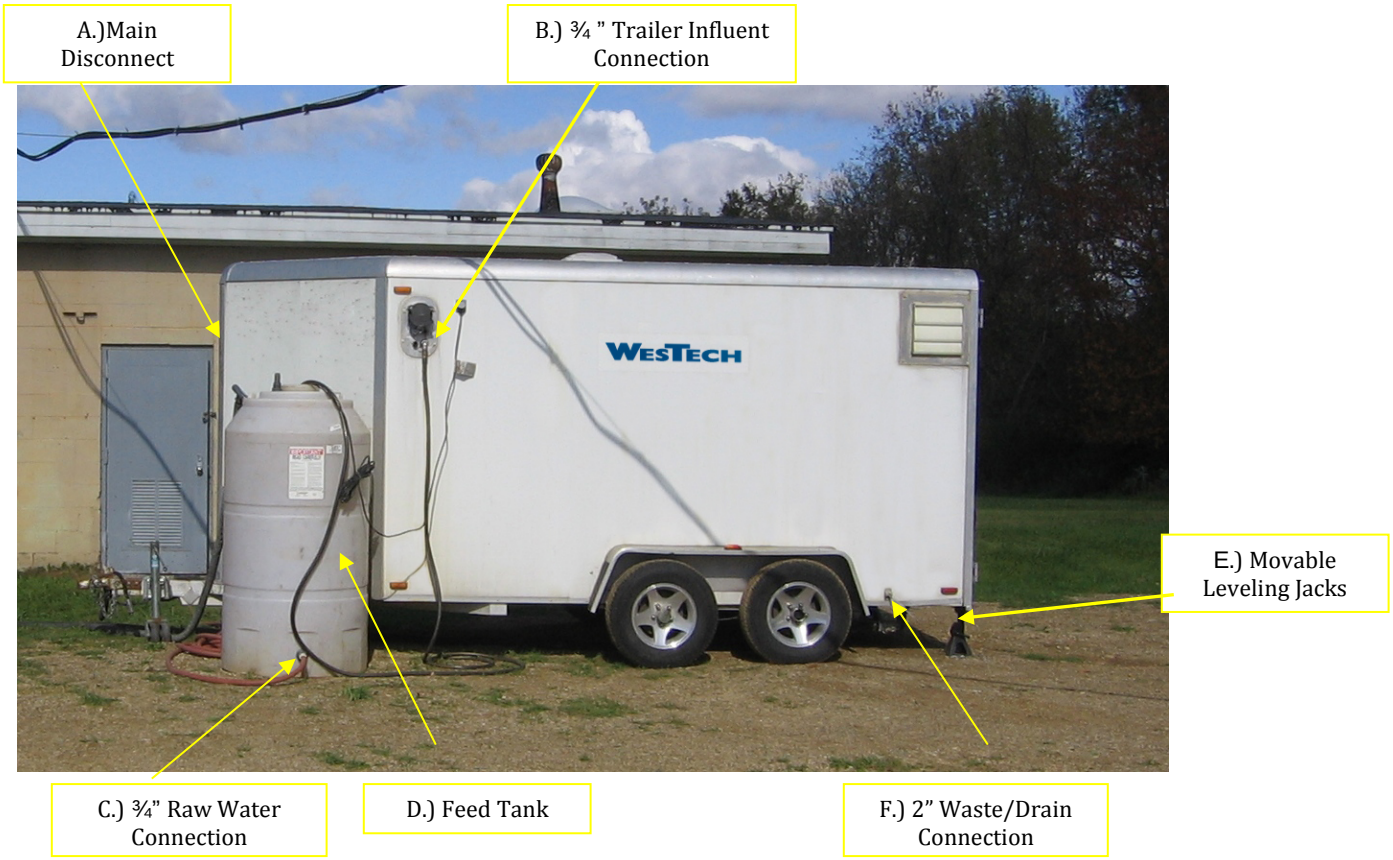
Dimensions

Pilot Plant No. 19C is pulled on a tandem axel 7’-0” x 18’-0” Tag-A-long (bumper hitch) (GVWR #1,800 & 2” ball) trailer that is 9’-1” overall height. The unit will require a level operating area of at least 10' wide x 20' long and a ceiling height of 19' with the positive draft aerator in place. Inlet connections are standard 3/4” garden hose size. The combined waste connection is a 1.5” male Camlock hose fitting.

Shipping Weight	2,750 pounds
Operating Weight	3,500 pounds
Power Requirements	230 volt; 30 amp; 1 ph; 60 Hz electric service 50 ft of 4/10 AWG–SOOW power cable provided

19C Process Connections

Direct Filtration or Atomerator Set-up – without Aerator

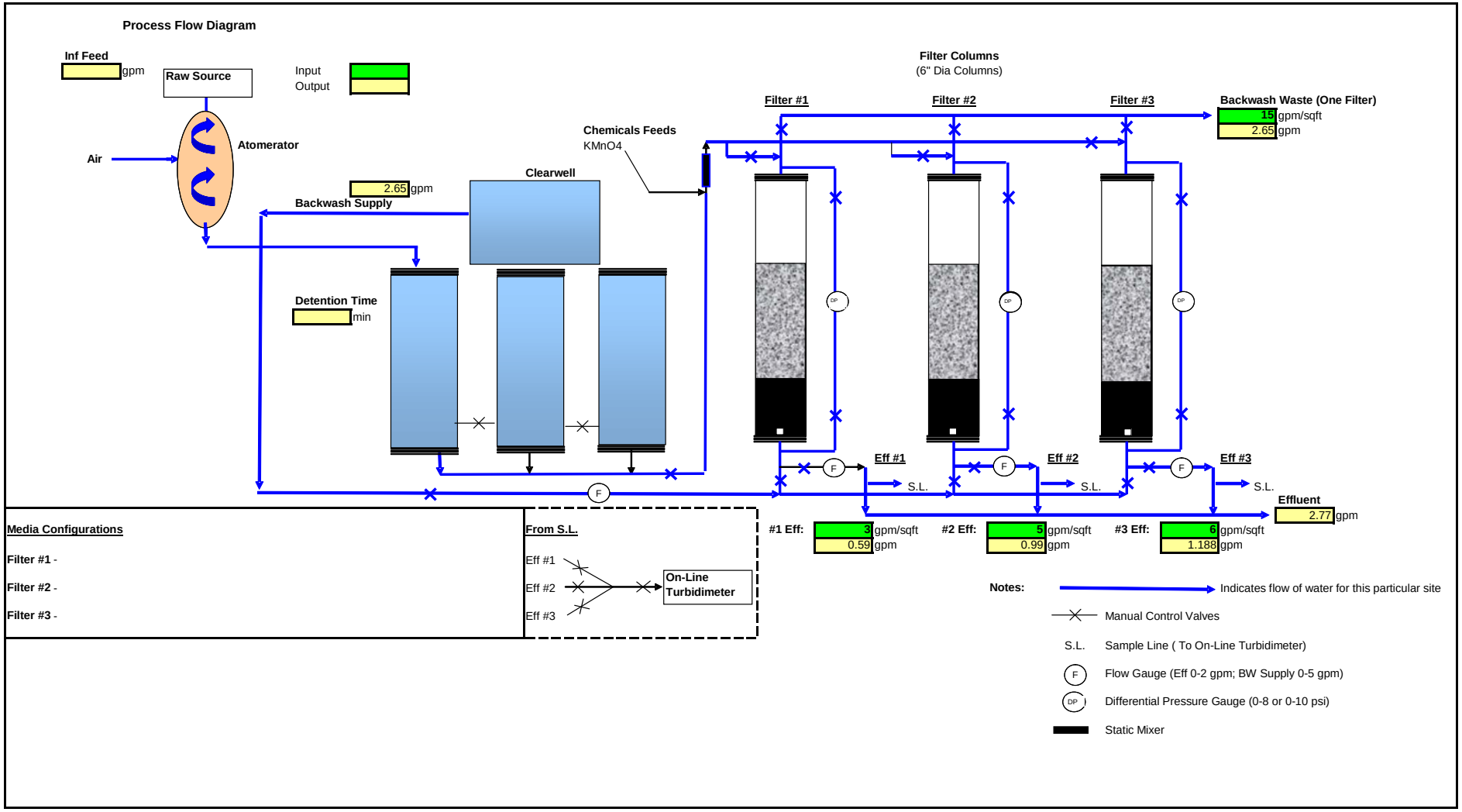


A.) Main Disconnect Box – The 240 1ph VAC power is hooked up here.
B.) Trailer Influent Connection – ¾" Garden Hose from transfer pump in Feed Tank
C.) Raw Water Connection – ¾" Garden Hose connection
D.) Feed Tank – 180 Gallon Tank with float switch
E.) Leveling Jacks
F.) Waste Line to below grade drain

Induced Draft Aeration Set-up

G.) Induced Draft Aerator – ¾ " Garden Hose Connection Inlet
H.) Main Disconnect Box – The 240 1ph VAC power is hooked up here.
I.) Waste Connection – 1.5" Waste line to below grade drain

19C Process and Instrumentation Diagram



APPENDIX B:

LABORATORY RESULTS – AMMONIA AND TOTAL ORGANIC CARBON IN KRONENWETTER WELL NO. 2 SAMPLE

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

Printed: 08/18/16

NLS Project: 264947
NLS Customer: 94182

Fax: 715 384 9787 Phone: 877 204 0572

Client: **MSA Professional Services (Mrshfld)**
Attn: Dan Borchardt
214 West Second Street
Marshfield, WI 54449

Project: **Kronenwetter Well #2 Investigation**

KO361 NLS ID: 937753
COC: 199362:1 Matrix: WW
Collected: 08/05/16 08:00 Received: 08/09/16

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Nitrogen, ammonia as N (unfiltered)	[0.048]	mg/L	1	0.025	0.075	08/17/16	4500-NH3 G-1997	721026460
Total Organic Carbon (TOC)	2.0	mg/L	1	0.50	1.0	08/16/16	5310 C-2000	721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and/or LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution and/or solids content.
ND = Not Detected (< LOD) LOD = Limit of Detection LOQ = Limit of Quantitation NA = Not Applicable
DWB = Dry Weight Basis %DWB = (mg/kg DWB) / 10000 1000 ug/L = 1 mg/L
MCL = Maximum Contaminant Levels for Drinking Water Samples. Shaded results indicate >MCL.

Reviewed by:

Authorized by:
R. T. Krueger
President

APPENDIX C:

MSA PLAN SUBMITTAL TO DNR FOR PILOT STUDY OF IRON AND MANGANESE REMOVAL AT KRONENWETTER WELL NO. 2

State of Wisconsin
Department of Natural Resources (DNR)
Bureau of Drinking Water and Groundwater, DG/5
PO Box 7921, Madison WI 53707-7921
dnr.wi.gov

Public Water System Approval Request

Form 3300-260 (R 2/15)

Notice: This form is authorized by ss. 281.11, 281.19(1) and (2) and 280.11, Wis. Stats., and ss. NR 108.04(2)(a), 811.08(1) and 812.09(2), Wis. Adm. Code. Completion of this form or a similar form approved by the Department is mandatory. Failure to submit a completed form to the Department is punishable: by a forfeiture of not less than $10 nor more than $5,000; or by a fine of not less than $10 or more than $100 or imprisonment of not more than 30 days, or both. Each day of continued violation is a separate offense (ss. 299.97 and 280.97, Wis. Stats.). Personally identifiable information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31-19.39, Wis. Stats.).

A. System Information

Water System Name	Water System Owner Name (if different than Water System Name)
Kronenwetter Water Utility	Village of Kronenwetter

B. Water System Representative or Owner (examples: clerk, sanitary district president, business owner, individual)			Water System Contact (if not the Owner) (examples: operator, water superintendent)		
Name			Name		
Duane Gau, Director of Public Works					
Street Address			Street Address		
1582 Kronenwetter Drive					
City	State	ZIP Code	City	State	ZIP Code
Kronenwetter	WI	54455			
Phone Number	Fax Number	Cell Number (optional)	Phone Number	Fax Number	Cell Number (optional)
(715) 693-4200	(715) 693-4202				
Email Address			Email Address		
dgau@kronenwetter.org					

C. Designer/Constructor Information

Name			Firm Name		
Daniel F. Greve, P.E.			MSA Professional Services, Inc.		
Street Address			Phone Number	Fax Number	Cell Number (optional)
1230 South Boulevard			(608) 355-8873	(603) 356-2770	
City	State	ZIP Code	Email Address		
Baraboo	WI	53913	dgreve@msa-ps.com		

D. Project Location (As applicable)

○ City ○ Town ◉ Village	County
of Kronenwetter	Marathon

Brief Project Description (DO NOT LEAVE BLANK)

Pilot testing for iron and manganese removal at Village of Kronenwetter Well #2

Applicability: This form applies to projects being submitted for municipal and other-than-municipal community, public water systems.

Number of Copies: Submit three copies of all the plans, specifications, forms and attachments.
Only one copy needs to be submitted for water main only projects.

MSA
PROFESSIONAL SERVICES
TRANSPORTATION • MUNICIPAL
DEVELOPMENT • ENVIRONMENTAL

August 22, 2016

Cathrine M. Wunderlich, P.E., Section Chief
Pubic Water Engineering Section
Bureau of Drinking Water and Groundwater
Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, WI 53707-7921

Re: Plan for Pilot Study - Iron and Manganese Removal
Village of Kronenwetter Well No. 2
Marathon County, Wisconsin

Dear Cathy:

On behalf of the Village of Kronenwetter Water Utility (DNR PWS No. 73717006), we are submitting this letter/report to describe a proposed Pilot Study for Iron and Manganese Removal at the Village's Well No. 2.

Background

The Village of Kronenwetter Water Utility includes two wells: Well No. 1 and Well No. 2. The two wells are located west of Lea Road in the west-central part of the Village and are approximately 500 feet apart. Both wells are constructed as relatively shallow screened wells in the sand-and-gravel aquifer, and each well produces approximately 700 gallons per minute (gpm). In spite of the close proximity and similar construction of the two wells, there are differences in water quality. Well No. 1 has consistently met all primary (health related) and secondary (aesthetic) drinking water standards established by U.S. EPA and Wisconsin DNR. Well No. 2 has also consistently met all drinking water standards, with the exception of secondary standards for iron and manganese.

The EPA and DNR water quality standards are 0.30 mg/L for iron and 0.05 mg/L for manganese. Levels of iron or manganese above these concentrations can cause aesthetic problems including discoloration of water and staining of laundry and sinks. Iron and manganese in the distribution system can also result in taste and odor problems.

When Well No. 2 was constructed in 1996 the concentrations of iron and manganese were very low, but these have increased over time. The concentrations of iron and manganese at Well No. 2 currently exceed the secondary drinking water standards, and the characteristic problems caused by elevated levels of iron and manganese have been observed. The iron concentration has increased to approximately 0.55 mg/l recently, while manganese has remained relatively constant at about 0.25 mg/l since 2005.

In response to several customer complaints regarding aesthetic problems from iron and manganese, the Village began adding polyphosphate to the water supply at Well No. 2 in 2005. Polyphosphate can keep low to moderate levels of iron and/or manganese in a soluble form (sequestering), which reduces the problems that would otherwise be caused by the insoluble precipitate forms of iron and/or manganese.

Polyphosphate has been found to be effective in reducing or eliminating the problems in water distribution systems where low to moderate concentrations of iron and/or manganese are present. The Village has also implemented a unidirectional flushing program to reduce water quality problems in the distribution system.

In spite of the polyphosphate addition at Well No. 2, earlier this year there were several additional customer complaints related to discolored water. As a result, the Village has decided to explore options for water treatment to reduce the levels of iron and manganese entering the water distribution system at Well No. 2.

The goals of this project are to:

- Determine the most cost-effective means of treatment, which will reliably reduce iron and manganese concentrations to acceptable concentrations at Well No. 2;
- Determine the scope and size (preliminary design) of treatment equipment and appurtenances required, and the building to house the treatment equipment; and
- Develop a budgetary estimate of capital and operating costs for the complete water treatment system improvements.

Typical Iron and Manganese Removal Systems

Iron and manganese are commonly removed from potable water supplies with a treatment process involving oxidation of the iron and manganese to insoluble precipitates, followed by removal of the precipitates by filtration. In some cases the oxidation and precipitation reactions occur quickly, allowing for filtration to occur almost immediately downstream. Depending on other water quality issues, most often the presence of naturally occurring organics, the oxidation and precipitation reactions can be delayed. Where these reactions are delayed, a detention tank is sometimes necessary, resulting in the need for high lift pumps either upstream or downstream of the filter to deliver the treated water to the distribution system.

The two chemicals most commonly used for oxidation of iron and manganese are sodium hypochlorite (liquid chlorine) and potassium or sodium permanganate, either separately or in combination. Potassium permanganate is available in solid form and must be mixed with water before application. Sodium permanganate is available from chemical suppliers in liquid form and, while more expensive than potassium permanganate, is widely used at small to medium sized utilities because it avoids the need to manually "batch" the highly corrosive and staining solid potassium permanganate before use.

Aeration is sometimes used in combination with these chemicals, to remove hydrogen sulfide or other gasses where present, and/or to reduce the chlorine required for oxidation of iron where the formation of regulated chlorination byproducts (trihalomethanes-TTHM or haloacetic acids-HAA) are a concern.

The filter media most commonly used for removal of iron and manganese are filter sand (with anthracite), synthetic manganese greensand (GreensandPlus™) and pyrolusite (manganese dioxide). In addition, various filter manufacturers have developed their own proprietary coated media specifically for iron and

manganese removal. Naturally occurring manganese greensand was available until recently, but is now cost prohibitive in North America.

The various combinations of chemical oxidants and filter media provide relative advantages and disadvantages with respect to:

- chemical oxidant cost
- chemical feed rate
- media cost
- allowable filter loading rate
- head loss through the filter
- filter run time before terminal headloss or breakthrough requires backwashing
- backwash rate and duration requirements

Proposed Pilot Test at Kronenwetter Well No. 2

In order to evaluate the performance of various chemical oxidants and filter media for the removal of iron and manganese at Well No. 2, a pilot test will be conducted. The pilot test will simulate the operation of a full-scale oxidation/filtration treatment system at Well #2. The pilot test results will lead to the selection and sizing of the most cost-effective system for reliably reducing iron and manganese to acceptable levels. Perhaps the most significant outcome of the pilot test will be the determination of whether detention and re-pumping facilities are necessary. Selection and sizing of the treatment system components will allow for the development of a reliable budgetary cost estimate for the water treatment improvements and the building to house the treatment system.

A *Report of Pilot Study for Iron and Manganese Removal at Village of Kronenwetter Well No. 2* will be prepared which includes:

- the pilot test protocol and results
- a recommendation for most cost-effective water treatment facility to produce a finished water that is well within the U.S. EPA and DNR drinking water standards for iron and manganese
- a budgetary estimate of total capital cost and annual operational cost associated with the recommended water treatment system.

With the project schedule in mind MSA has collected a water sample from Well #2 for laboratory testing, to get a head start on determining the relative difficulty of treating the water from Well No. 2. Specifically, samples were tested for ammonia and total organic carbon concentrations. Ammonia in the water will typically create a high chlorine demand, making it difficult to oxidize iron and/or manganese. Ammonia can also prevent the formation of filterable precipitates. Fortunately, the sample collected from Well #2 had no detectable ammonia. The sample collected from Well #2 had a total organic carbon concentration of 2.0 mg/L. As a rule of thumb, concentrations of total organic carbon above 2 mg/L can be an indication that it may be difficult to oxidize and precipitate iron and (especially) manganese, as the naturally occurring organics can form metal complexes that delay the rate of oxidation and precipitation. The

interferences caused by total organic carbon, however, are highly dependent on the forms of organic carbon present.

Pilot Testing Provider
MSA has discussed the pilot testing needs at Well No. 2 in Kronenwetter with experts from three (3) manufacturers of water treatment equipment and obtained proposals from all three. We have incorporated their ideas into our proposed protocol for the pilot testing. The pricing obtained from the three water treatment equipment manufacturers were similar. MSA selected the equipment manufacturer that we believe will provide the Village with the most comprehensive, thorough, and timely pilot testing for a reasonable fee.

For the pilot testing at Well No. 2 in Kronenwetter, MSA will team with **WesTech Engineering, Inc.** The potable water treatment division of WesTech is the former General Filter Company, based in Ames, Iowa, which WesTech purchased in January 2013. WesTech, especially as General Filter Company, has a long resume of successful projects in Wisconsin for iron and manganese removal and other potable water treatment processes, and has performed pilot testing as part of the initial phase of many of those projects. They have very experienced personnel and are very well equipped to perform the pilot testing at Well No. 2.

Pilot Testing Equipment
Pilot testing will conducted in the WesTech trailer-mounted pilot plant. The pilot plant is equipped with:

1) pressure aerator
2) 180-gallon raw water feed tank
3) forward flow pumps (one for each filter column)
4) induced draft aerator
5) detention tanks
6) filter columns consisting of three (3) 6.75-inch diameter x 60" high clear shells
7) peristaltic chemical feed pumps
8) backwash pump
9) instrumentation, including isolation valves, flow meters, pressure transmitters, etc.
10) process control laboratory including HACH portable test kit.

The pilot testing trailer will be parked in the Wellhouse #2 driveway, outside the double doors. An electrical connection will be required from the main disconnect switch on the pilot plant trailer and a 230-volt, 30 amp, single phase breaker in the wellhouse electrical lighting panel. A ¾-inch diameter hose connection is required between the well discharge pipe and the pilot plant trailer. A 1.5-inch waste drain connection at the pilot plant trailer will be utilized to route treated water and backwash water to either the ground surface or to a floor drain in the wellhouse.

Pilot Testing Protocol
Three filter columns are proposed to be utilized for the pilot testing. The attached figures illustrate the proposed pilot testing protocol in a "flow chart" format. On the flow charts, "success" implies an

acceptably long filter run time before breakthrough of iron or manganese or before development of excess head loss through the filter. The protocol assumes neither sodium permanganate nor detention are necessary. The first step in the pilot testing will be to conduct jar testing to get an indication whether a filterable floc can be achieved without sodium permanganate or detention. In the event that the initial filter runs do not achieve the desired results, permanganate and/or detention would be added later. Initially, chlorine alone will be used as the oxidant. The assumed initial filter loading rate is shown on the "flow chart" for each column. If the initial filter runs are successful, the pilot testing for any particular column (media) could be completed in as few as three filter runs, including a confirmation run for the recommended loading rate. This is feasible in a one to two week pilot test, even though "success" implies a long run time before terminal headloss or breakthrough are reached. If the initial filter runs are not successful, the pilot testing for any particular column (media) could take as many as five filter runs. But "failure" implies shorter run times, so it will be possible to complete the testing, especially in a two week pilot test.

One filter column will contain 12 inches of anthracite above 18 inches of GreensandPlus™. GreensandPlus™ is by far the most widely used synthetic greensand for potable water treatment in the United States, and is commonly used for iron and manganese removal applications. A layer of anthracite is commonly used above the GreensandPlus™ as a "pre-filter" to extend filter run times.

A second filter column will contain 30 inches of pyrolusite. Pyrolusite is manganese dioxide, with a finer gradation than greensand. Pyrolusite use for iron and manganese has become fairly widespread in recent years. The potential advantage of pyrolusite is a high loading rate, which can reduce the size and cost of the filter and the building to house the filter. The disadvantages of pyrolusite include higher head loss through the filter, potentially shorter filter run times due to terminal headloss being reached sooner, and higher backwash flow and volume requirements.

A third filter column will contain 12 inches of anthracite above 18 inches of AnthraSand™, which is a proprietary manganese dioxide coated sand media developed by General Filter Company (WesTech). The advantages of AnthraSand™ are lower cost as compared to GreensandPlus™ and potentially longer filter runs due to coarser media. The disadvantage is that the media must be coated in-situ (within the filter tank after placement).

MSA will conduct a project kick-off meeting with Village and Marathon Technical Services (MTS) personnel to review the pilot testing plan and protocol, the schedule for the pilot testing, and items to be provided by the Village and/or MTS.

During pilot testing, MSA will visit the site on a daily basis to monitor the progress of the filter runs and discuss the results with the manufacturer's technician performing the tests, the Village and MTS. MSA's Dan Borchardt lives in Kronenwetter, which allows for very efficient oversight of the pilot testing. Based on the test results obtained at that time, MSA may suggest changes to filter loading rates, oxidant feed rates, oxidant, and/or filter media for subsequent filter runs.

During pilot testing, the flow (loading) rate and pressure drop (head loss) through each filter column will be monitored. Iron and manganese concentrations will be monitored on site with a HACH® test kit and field test results will be verified with periodic split samples that are sent to an outside laboratory for confirmation of the field results.

For each filter run, the oxidant type, oxidant dose, filter media, and filter loading rate will be noted. The filter run time will be noted when the filter run is terminated, which will be at the point of iron or manganese breakthrough or terminal headloss through the filter. The filter will be backwashed at the end of each filter run, at a rate (gpm per square foot of media) typical for the respective media type.

The following data will be measured/analyzed on site, at the start of each filter run, at intervals of approximately two hours during the filter run, and at the end of each filter run, for each filter column:

- Flow rate (filter loading rate)
- Influent and effluent pressure (filter head loss)
- Influent and effluent iron concentrations
- Influent and effluent manganese concentration
- Effluent chlorine concentration
- Influent and effluent temperature
- Influent and effluent turbidity

The following data will be measured/analyzed on site, once per day for each filter column:

- Influent and effluent color
- Influent and effluent alkalinity
- Influent and effluent hardness
- Influent and effluent pH

In addition, the following filter influent and effluent water samples will be collected at the start and end of each filter run, or a minimum of once per day, and analyzed by an outside laboratory, as a check of the on-site measurements:

- Iron
- Manganese
- Total organic carbon (raw water only)

Report of Pilot Study

A preliminary and final *Report of Pilot Study for Iron and Manganese Removal at Village of Kronenwetter Well No. 2* will be prepared, which will include:

- An executive summary of the pilot test findings and recommendations for design of a water treatment facility for iron and manganese removal
- A narrative summary of the testing protocol, with respect to filter media, filter loading rate oxidant, oxidant dose
- All of the results of water quality testing (field and laboratory), filter head loss over time, and other data collected during the study, in tabular and graphical form

Cathrine M. Wunderlich, Section Chief
WDNR Public Water Engineering
August 22, 2016

- An analysis of the data collected and recommendation for the most cost effective oxidant or combination of oxidants, oxidant dose rate(s), filter media, and filter loading rate
- An estimate of the expected filter run time before bleed-through or terminal head loss
- A determination of the size of filter and other treatment equipment required, for the well pumping capacity of 700 to 800 gallons per minute
- An estimate of the flow rate and volume of backwash water produced, and recommendation for the number and volume of backwash water detention tanks to be provided
- A preliminary floor plan for a building to house the new water treatment facilities
- A budgetary cost estimate for the recommended treatment facilities, and building to house the treatment system, to include estimated equipment and construction costs; engineering design, bidding and construction administration fees, DNR submittals, PSC submittals, and funding applications/administration. MSA will obtain input from the Village regarding the desired building floor plan, exterior appearance, and materials of construction
- An estimate of the annual operation and maintenance costs for the recommended water treatment facility. The O&M cost estimate will include chemical costs, energy costs, and labor
- An implementation schedule for preliminary and final design, regulatory approvals, bidding, construction and start-up

The Village intends to have the pilot testing done in October 2016, before cold weather creates problems with freezing in the lines between the wellhouse and the pilot plant trailer. The Department's prompt approval of this pilot testing plan would therefore be greatly appreciated.

If you have any questions regarding this letter/report, please call me at (608) 355-8873. Thank you.

Sincerely,

MSA Professional Services, Inc.

Daniel F. Greve, P.E.

DG:dp
Enc.

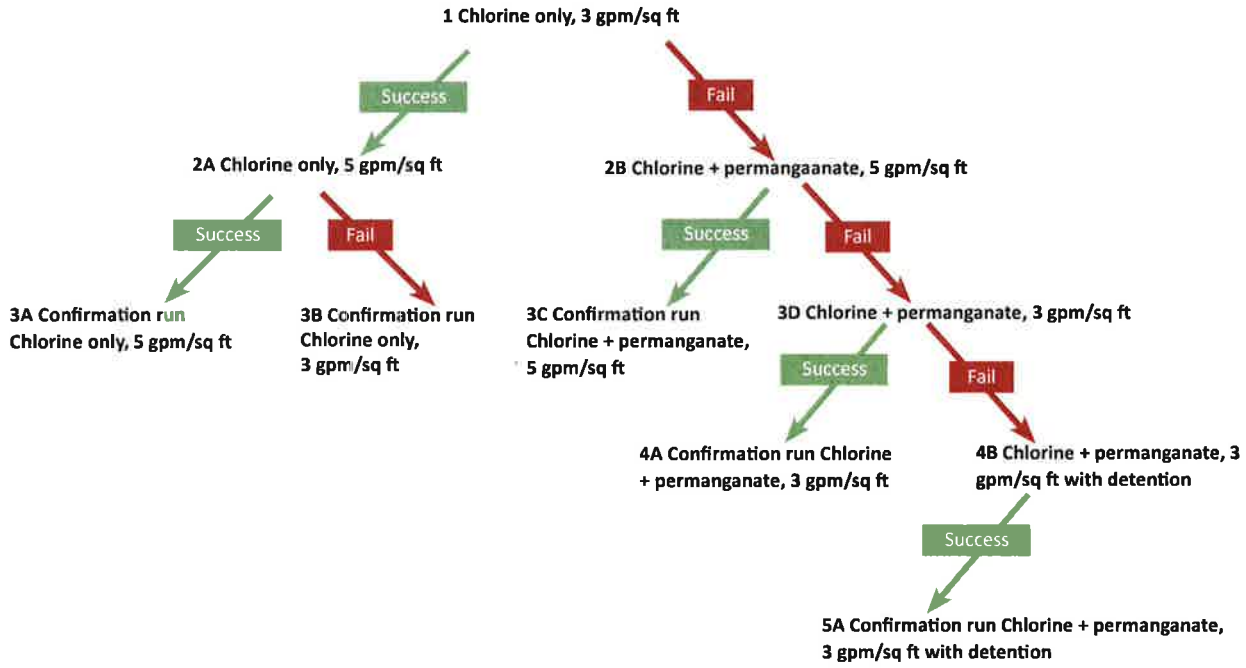
PROPOSED PILOT TESTING PROTOCOL
KRONENWETTER, WI

Filter Column No. 1

18" GreensandPlus and 12" Anthracite

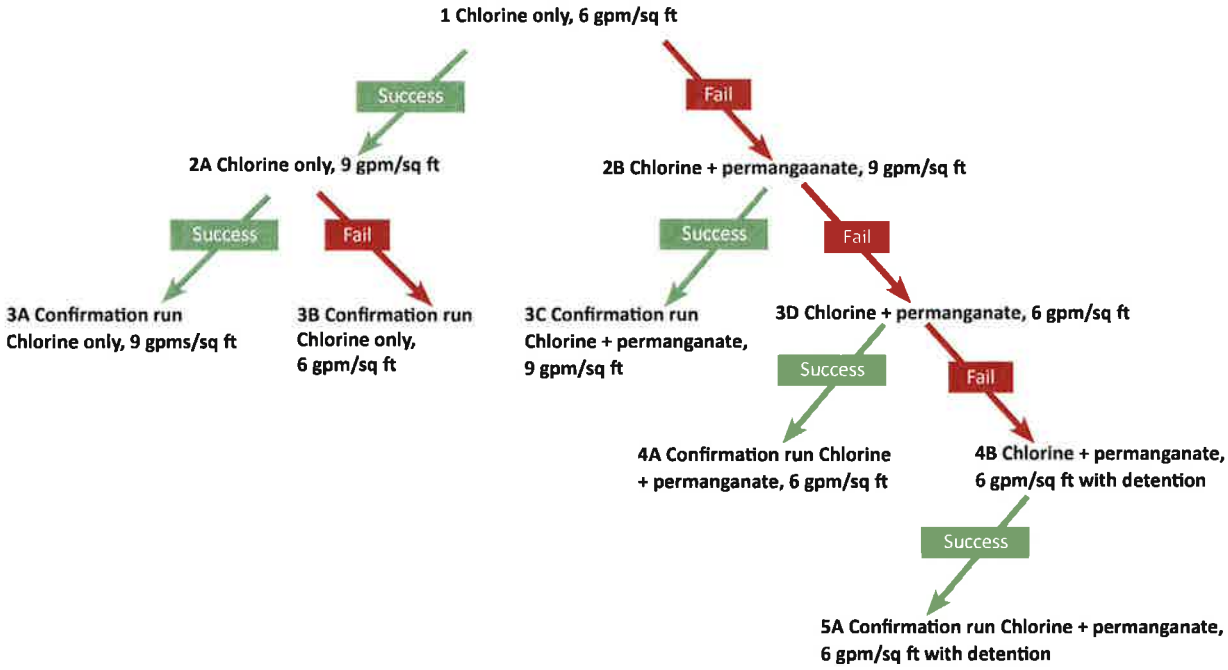
Filter Column No. 3

18" Anthrasand and 12" Anthracite



Filter Column No. 2

30" Pyrolucite



Well Number 2 Pilot Treatment Plant Study

Proposal

Village of Kronenwetter, WI

August 24, 2016

Table of Contents

Strand Associates, Inc.®
910 West Wingra Drive
Madison, WI 53715
(P) 608-251-4843
(F) 608-251-8655

August 23, 2016

Mr. Duane Gau
Director of Public Works
Kronenwetter Municipal Center
1582 Kronenwetter Drive
Kronenwetter, WI 54455

Re: Request for Proposal for Engineering Services – Well Number 2 – Pilot Treatment Plant Study – Village of Kronenwetter

Dear Mr. Gau:

On behalf of Strand Associates, Inc.® (Strand), thank you for the invitation to submit a proposal for the Well Number 2 – Pilot Treatment Plant Study for the Village of Kronenwetter (Village). Having followed development of this project for some time and having completed several recent similar projects, we are excited about this opportunity. By selecting Strand for this project, the Village will benefit in the following ways:

- **Our focused pilot approach will provide the Village opportunities to develop optimized designs.**
- **Our technical expertise will consider technologies that provide the Village flexibility for addressing evolving water quality concerns.**
- **Our team's recent relevant experience with piloting, design, and construction will give the Village confidence in proceeding with future phases of the project.**
- **Our alternative approach will focus Village resources where they are needed most.**

We call your attention to an alternative approach that is explained starting on page 6 of the *Project Understanding and Approach* section. In short, we feel the Village would be better served by a preliminary engineering evaluation that defines the project need and establishes an accurate project budget and realistic implementation schedule, in lieu of jumping right into pilot testing of treatment systems. We are confident that this approach will, in the end, save the Village time and money.

We look forward to working with the Village on this very important project. If you have any questions, feel free to call me.

Sincerely,

STRAND ASSOCIATES, INC.®

Michael J. Forslund, P.E.
Project Manager
P160.670/MF:TK

Contact Information:

Michael Forslund, P.E.
Project Manager
910 West Wingra Drive
Madison, WI 53715
Phone: 608-251-4843

mike.forslund@strand.com

www.strand.com

Corporate office in Madison, Wisconsin.

Project Understanding and Approach

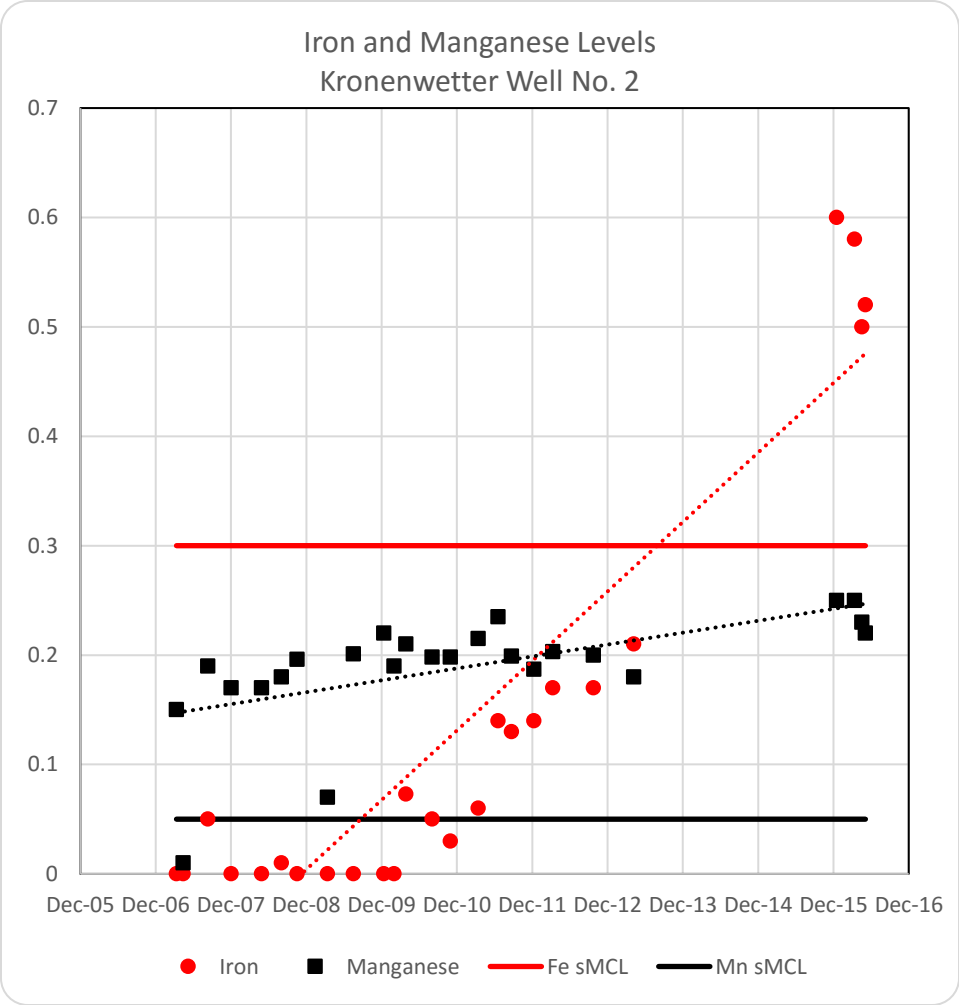
Our Focused Pilot Approach Will Provide the Village Opportunities to Develop Optimized Designs

This section presents our understanding and approach to complete a pilot scale evaluation of treatment for iron and manganese at the Village of Kronenwetter's Well No. 2. A summary of our understanding of the existing water system and the need for evaluation of iron and manganese removal is followed by a discussion of treatment options and potential impacts of changing water quality. The section concludes with a schedule and detailed scope of services based on the items in the Request for Proposal (RFP). In addition, we present an alternative approach that we encourage the Village to consider.

Our alternative approach described on page 6 is intended to guide the project through a modified progression that delays piloting to latter stages of the project.

Increasing levels of iron and manganese result in the need for more aggressive measures to control them.

The Village wishes to conduct pilot scale evaluations to determine an effective treatment method to reduce levels of iron and manganese in the Village's Well No. 2. The Village water system consists of two 700 gpm wells, a 300,000-gallon elevated tank, and 58 miles of water main. Portions of the system have been in operation since 1996. In 2005, there were several colored water events that were traced to a significant increase in manganese in Well No. 2. In 2006, the Village implemented sequestration using polyphosphates to control the precipitation of manganese in the distribution system. In 2016, additional colored water events occurred. Additional raw water testing revealed that iron levels in Well No. 2 have increased to around 0.55 mg/l, while manganese levels have increased only slightly over time. Well No. 1 has very low levels of iron and manganese, well



Elevated levels of manganese and iron create aesthetic concerns that can be effectively addressed with the right combination of oxidation and filtration.

below levels that would require treatment. The increases in iron and the long-term deposition of iron and manganese in the distribution system has resulted in increasing water quality complaints. In the near term, the Village has implemented a unidirectional flushing program and instituted a second fall flushing program to help control the colored water complaints.

The Village is currently evaluating the continuation of the polyphosphate sequestration program. It has been our experience that polyphosphates are relatively effective in controlling colored water issues when the combined iron and manganese levels are 0.5 mg/l or less. Above this level, water quality issues become more prevalent. In fact, the *Recommended Standards for Water Works, 2012 Ed.*, recommends against using polyphosphates to sequester iron and manganese when the combined levels exceed 0.5 mg/l and explicitly prohibits there use when levels exceed 1 mg/l. The Wisconsin Administrative Code, NR 811, is based on these standards and limits the use of polyphosphates for sequestration to a maximum of 1 mg/l.

It has been our experience that polyphosphates are relatively effective in controlling colored water issues when the combined iron and manganese levels are 0.5 mg/l or less.

Our focused pilot approach provides the village opportunities to develop optimized designs.

Historically, iron and manganese removal is generally achieved through oxidation and filtration. There are numerous types of oxidants and medias available to remove iron and manganese. The medias can generally be thought of in two forms. There are true filtration medias (sand and anthracite) that rely on the oxidant to convert the iron and manganese to a solid state so they may be filtered out and oxidative medias (pyrolusite/manganese coated media/greensands) that rely on the interaction of the active media with the dissolved iron and manganese. The oxidative medias rely on the chemical interaction with the iron and manganese rather than the filtering process, although they do also perform a filtration function.

Given the Village's desired 1 to 2-week time frame for pilot testing, the selection of appropriate media, loading rates, and oxidants will be critical. Many pilot plants generally only operate two test columns at a time, although they can be modified for more. When including pilot set up, adjustment, and tear down, the pilot may only produce six usable day's worth of data from a 2-week test period. In addition, the more complex the testing regime, the more difficult it will be to perform and monitor the testing. Understanding of oxidant and media capabilities will allow the pilot testing to be focused and result in the successful completion of the pilot testing within a limited time frame.

It is likely that the most cost-effective means of treatment will utilize chlorine as an oxidant with an oxidative media. This form of treatment has typically proven very effective in removing iron and manganese at similar locations. While these medias are typically more expensive, they permit higher surface loading rates and do not typically require detention or other stronger oxidants, such as permanganates. This results in smaller equipment foot prints and typically overall lower installation costs. These systems do tend to require higher backwash rates, which along with the cost of operation need to be carefully considered.

Piloting approach addresses evolving TTHM concerns.

In addition to the removal of iron and manganese, disinfection byproducts are a potential concern for the Village's system. The current total trihalomethanes (TTHM) levels reported in the distribution system have ranged from 18 to 40 ug/l, with the current MCL being 80 ug/l. The data suggests a gradual increase in levels of TTHMs in the system. In addition, neighboring water systems also have had issues with disinfection byproducts, with communities such as Wausau practicing chloramination for disinfection to minimize TTHM formation.

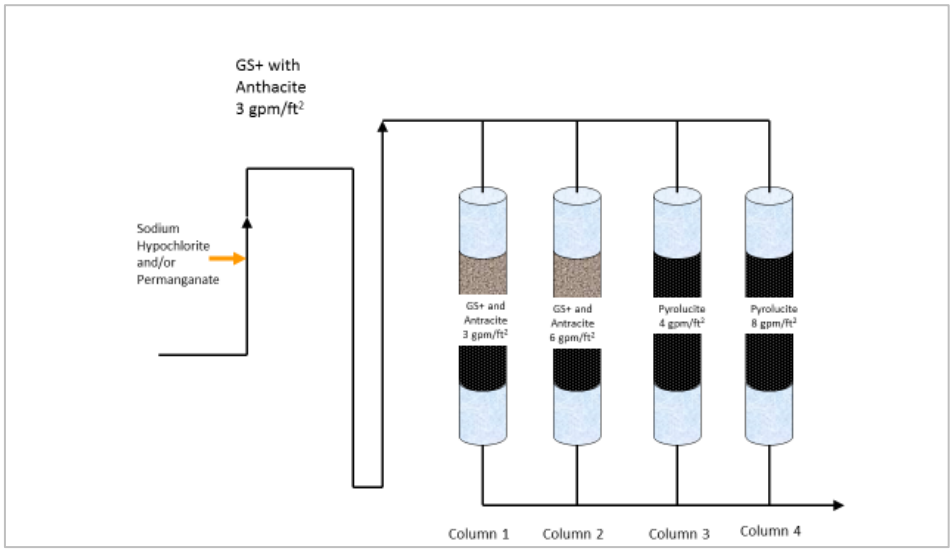
Chlorine is the preferred oxidant/disinfectant because it is more user-friendly and easier to handle than other oxidants such as permanganate. However, TTHMs are formed by the interaction of chlorine with the organics in the raw water. The iron and manganese removal process itself is not likely to have any impact on the TTHM formation potential of the water, but a treatment system that relies on chlorine as an oxidant would be problematic if the TTHM formation potential in the raw water increases. An alternative oxidant may be necessary, should changes in the raw water quality result in higher levels of TTHMs.

An oxidant other than chlorine may be necessary if TTHM levels increase.

The proposed piloting approach is intended to identify a media that will effectively work with chlorine and permanganate as an oxidant. This would permit a move away from chlorine-based oxidation, should TTHM formation become a problem. The pilot will consist of up to four columns. The columns will be loaded with two different oxidative medias. At this time, we anticipate that the filtration media will be a pyrolusite and a manganese coated media such as Greensand Plus. A common oxidant (chlorine) feed will be added in front of all filter columns and different loading relates applied to the columns. Initial testing will be used to establish rates for follow-up testing. The loading rates will likely be on the order of 3 to 12 gpm/ft^2, depending upon the media and performance of previous testing. Tests will be run to breakthrough or high differential pressure to estimate filter run length. A second round of testing under similar conditions will be conducted to confirm the initial run or to test additional filtration rates. A third and fourth run will be performed under similar conditions utilizing a second oxidant (permanganate). Sampling will be conducted in the field for raw and finished water quality, with laboratory testing performed on a daily basis to verify field data results. Because radium coprecipitates with iron and manganese, a sample of the backwash waste will be collect to evaluate the radium content of the backwash stream. This is a common Wisconsin Department of Natural Resources (WDNR) requirement for filtration evaluation.

Sampling would typically be conducted in the field for raw and finished water quality, with laboratory testing performed on a daily basis to verify field data results.

We also suggest that during piloting TTHM formation potential tests be performed pre- and post-filtration for each media type and oxidant type. TTHM formation is anticipated to be a function of the raw well water and is not anticipated to be significantly impacted by the iron/manganese removal process. Testing will confirm this. Further testing of TTHM formation potential, outside of the time frame of the pilot study, should be conducted to track if a change to the disinfection and oxidation practices may be required.



Piloting using multiple oxidants and feed rates.

System operation will be discussed prior to piloting to maximize data obtained during testing.

In order for the pilot system to obtain representative results and collect the maximum amount of data, it is important that a continuous feed of well water be provided throughout the piloting period. The current well capacity exceeds the typical average-day demand. In order to maintain a continuous flow, we recommend that the well pump discharge be directed to waste or alternative system set up to permit the well pump to run continuously during pilot operations. We will work with staff prior to pilot testing to develop an operational scheme to facilitate this practice.

Vendors were contacted to determine pilot plan availability, costs, and schedule.

In preparation of this proposal, we discussed the piloting opportunities with numerous equipment providers. A summary of the providers contacted, anticipated costs, and lead times are summarized in the following table.

Pilot Provider	Local Representative	Cost	Lead Time Requirements	Number of Columns	Media	Qualifiers
Artesian of Pioneer (AOP)	Peterson Matz	$18,000	5-6 Weeks	3	Sand/Anthracite Maris Pyrolusite	24-hour staffing by AOP lab samples paid by the Village collected by AOP.
Layne Water Treatment	Layne Northwest	$25,000	5-6 Weeks	4	Sand/Anthracite Greensand Plus Pyrolusite	Includes lab cost. Includes full report.
Water Surplus	Water Surplus	$19,000	2-4 Weeks	3	Sand/Antrhracite Pyrolox advantage Pyrolusite	Technician with some overnight unstaffed operation. Include daily lab costs.
Tonka Water	William Reid	$24,000 $16,000	5-6 Weeks	3 2	Sand/Anthracite Greensand Plus Pyrolusite Greensand Plus Pyrolusite	Excludes lab costs. Includes full report.
ATEC Systems	ATEC Systems	$12,500	2-4 Weeks	3	Pyrolusite Greensand Greensand Plus	Excludes lab costs. 24-hour staffing.

Based on the lead times provided by pilot vendors, it seems unlikely that the pilot study will be finalized in time for the December Board meetings. However, we anticipate the pilot test will be completed by the end of 2016. We have proposed the following schedule based on the lead times shown in the table above.

Proposed Schedule	
Engineering Award and Approval	September 13, 2016
Pilot Plant Provider Selection and Approval	September 20, 2016
Lead Time for Delivery of Pilot (4 Weeks)	October 17, 2016
Two-Week Pilot Field Work Complete	October 31, 2016
Prepare and Submit Draft Report	November 28, 2016
Review and Finalize Report	December 12, 2016

Pilot Study for Iron and Manganese Removal – Scope of Services

The following outline summarizes the Scope of Services to perform pilot testing and prepare the desired report for Well No. 2.

1. Attend the kickoff meeting. We will meet with Village staff to gather information necessary to prepare the pilot testing plan. This will include collecting and reviewing well construction data, water quality data, and pumping records. During the kickoff meeting, we will review the facility to determine connection points for the pilot plant and discuss operational considerations during the pilot testing. In order to further develop the testing plan, at this time or prior to the meeting we may request additional laboratory testing of specific water quality parameters.

2. Prepare Pilot Testing Plan of Study and assist the Village with finalizing Pilot Equipment proposals. We will finalize a plan of study to outline the objectives, timeline, configuration, data collection efforts, and ancillary needs to conduct the Pilot Study. This will become the basis for finalizing the scope of the proposals with the equipment manufacturer to conduct pilot testing. The pilot testing equipment will be provided under a separate agreement between the Village and pilot equipment provider. The pilot testing plan will identify the oxidants, target filtration rates, and media for the pilot testing.

We will draft a pilot plan to outline the objectives, timeline, configuration, data collection efforts, and ancillary needs to conduct the Pilot Study.

3. Meet with the selected pilot equipment vendor during mobilization of the pilot plant and review the pilot testing plan with them. We will document the pilot plant configuration and methods for inclusion in the final report.

4. Observe the first day of operation of the pilot plant and the first day a new oxidant is utilized. Data collection and lab sample collection will be performed by the vendor's staff. Data collection needs will be outlined in the testing plan and is anticipated to include measurements of the following:
   a. Raw and finished iron
   b. Raw and finished manganese
   c. Oxidant dose and residual
   d. Flow rate
   e. Volume treated
   f. Differential pressure
   g. Field pH, temperature
   h. Lab water quality (hardness, alkalinity, total dissolved, pH, temperature, iron, manganese, and TTHM formation potential)

5. It is most economical to have the cost of laboratory testing invoiced by the selected laboratory directly to the Village. Samples will be collected by the vendor.

The cost for laboratory sampling can be paid directly by the Village to avoid unnecessary markup.

6. Monitor and review pilot plant testing and operation through regular communication with the vendor's field staff throughout the duration of the pilot testing. Update and adjust the pilot testing plan as necessary during the pilot testing period to adjust for observed results.

7. Prepare a draft report documenting the pilot study. The report will include a narrative description of the pilot testing apparatus, procedures, and results. Supporting data tables and charts will be utilized to demonstrate the operating characteristics and anticipated performance of a full scale unit. Recommendations will be developed for proposed oxidant, filtration media, loading rates, and equipment sized to treat 700 to 800 gpm. The compatibility of the existing pumping equipment with the proposed treatment system will be evaluated. The report will also discuss the potential for treatment and implications of a future well that may require similar treatment.

8. Develop Opinion of Construction Cost for full scale installation. If the Pilot Testing predicts good performance, we will develop a capital cost opinion for a full scale installation. We will also develop anticipated O&M costs for the new process and equipment and a schedule of implementation. This will be included in the draft report.

9. The draft report will be submitted to the Village for review. Five hard copies of the Draft Report and an electronic copy will be submitted to the Village.

10. Meet with the Village to Review Draft Report. We will meet with the Village to review the Draft report, discuss the findings, and accept comments.

11. Prepare Final Report. We will finalize the report based on feedback from the Village. Twenty paper copies will be furnished along with one electronic copy (PDF format).

Alternative approach delays piloting without impacting project schedule.

The approach above is based on the scope of services described in the RFP. However, having completed many similar projects we feel the Village would be better served by an approach that focuses on documenting the existing water quality concerns, identifying likely treatment technologies, obtaining initial agency approvals, and developing project budgets and an implementation schedule.

The schedule included in the RFP calls for completion of the pilot report by mid-December. Based on pilot vendor availability, this is an aggressive schedule. While piloting will likely be needed to validate the treatment scheme, the information that will result from piloting is less critical at this stage of the project. The early stages of water treatment projects typically include a more in-depth review of water quality, potential treatment methods, and develop detailed project budgets and schedules.

A Preliminary Engineering Report will establish project budgets, schedule, and assist in obtaining early agency approvals; piloting can take place later in the project.

Based on a conversation with Mark Thompson on August 19, the Village passed a budget amendment in 2016 to allow for completion of the pilot study after manganese concerns escalated. We understand the Village would like to resolve the manganese issue to address the recent uptick in customer complaints. This alternative approach will not impact the implementation schedule. We will be able to provide the Village with budget information in October for the 2017 budget without completing the pilot. The pilot study, if needed, can be completed during design or potentially during construction.

We propose the following Scope of Services as an alternative approach.

1. Meet with the Village to discuss project objectives and timelines.

2. Conduct an evaluation of water quality from Wells No. 1 and No. 2 that will supplement the 2014 Well Number 2-Water Quality Study Report. If warranted, additional sampling may be needed. The review will focus on manganese, iron, and TTHM formation potential, but will also include a broad review of characteristics that may impact treatment.

3. Evaluate all the treatment techniques available to reduce manganese and iron concentrations including cost and space needs.

4. Evaluate options for reducing TTHM levels if found to be an imminent concern. If not an imminent concern, we will layout a course of action for the Village to take, should if TTHM levels increase in the future.

5. Recommend a treatment method for reducing manganese and iron concentrations. This will include the following:
   a. Preferred oxidant.
   b. Filtration media.
   c. Filter equipment sizing.
   d. Backwash and residuals management.
   e. Disinfection agent.
   f. Target filter loading rates.
   g. Backwash water flow requirement.

6. Prepare a preliminary layout for the treatment and chemical feed equipment.

7. Establish an opinion of probable construction cost for the chosen treatment scheme.

8. Establish an implementation schedule.

9. Prepare a draft preliminary engineering report and submit to the Village for review and comment.

10. Finalize the report after incorporating comments from the Village.

11. Submit the preliminary engineering report to the Wisconsin Department of Natural Resources (WDNR) for approval as required in NR 811.09.

12. Submit a Request for Construction Authorization to the Wisconsin Public Service Commission (PSC). Obtaining the PSC construction authorizations have been a more timely process than in the past. PSC now requires more information and conducts far more in-depth reviews of each project prior to granting authorization to construct. Obtaining this approval early in the project will be important.

Obtaining PSC Construction Authorization early in the project will be critical to implementing treatment in a timely manner.

Key Personnel

Our Responsive and Reliable Engineering Team Will Act as an Extension of the Village Staff

It is important to us that our engineering team fit in with the Village's staff to give the Village confidence that its projects are in reliable hands. The staff selected for this project have the technical expertise and recent relevant experience in evaluating and treating water supplies with similar water quality concerns. The people at the top of our organization chart are tasked with ensuring the Village's expectations are met every step of the way. We make every effort to maintain engineering team consistency throughout the various stages of a project. The team that works with the Village during the piloting process is intended to be the same team that works with the Village throughout the project. Resumes are included at the end of this section.

We are certain the Village will be confident that our motivated and experienced project team can provide the highest level of service and quality.

Mike Forslund, P.E.
Project Manager

Andy Mullendore, P.E.
Quality Control Engineer

Ryan Wood, P.E.
Project Engineer

Support Staff (as needed)
Administrative Staff, Designers, and Technicians

Project Manager

Michael J. Forslund, P.E., is a registered professional engineer in Wisconsin and has focused on water supply and treatment projects since joining the Madison office in 2000. His project management experience includes numerous water system evaluations, water supply and treatment facility design, and design and observation of numerous groundwater supply wells and treatment facilities. Mike has been involved with many similar water supply and treatment projects, including recent groundwater treatment projects in Bristol, Fond du Lac, Merrill, Platteville, and Rome, Wisconsin. Mike assisted the City of Merrill with its manganese reduction project, which included piloting, analysis, and treatment of water from the shallow sand and gravel wells along the Wisconsin River.

Mike is focused on water supply and treatment projects.

Project Engineer

Ryan D. Wood, P.E., is a professional engineer in Wisconsin and Illinois and has worked on water supply and treatment projects since joining our firm in 2006. Ryan has provided water treatment facility design and construction services in Algoma Sanitary District No. 3, Bristol, Fond du Lac, Madison, Merrill, and Platteville, Wisconsin; in Belvidere, Loves Park, and in more than 10 facilities in Rockford, Illinois. For the Bristol, Merrill, and Rockford water treatment plant projects listed in our *Firm Experience* section, Ryan was involved in the associated manganese removal pilot testing studies. That work generally included designing the pilot protocol, providing associated field work during pilot testing, analyzing data, and writing the pilot design report.

Ryan has designed pilot protocols and conducted testing.

Quality Control

Andy L. Mullendore, P.E., will serve as the Quality Control Engineer for the project. Andy is a registered professional engineer in Wisconsin and has been involved in numerous water supply projects since joining our Madison office in 1993. He recently completed the design of the reconstruction of Madison Well No. 7 and Onalaska Well No. 9. These projects included demolition and reconstruction of a well house with new iron and manganese removal plants. He served as a Project Manager for construction of 10 filtration plants for the City of Rockford. These filtration plants were designed for the removal of iron, manganese, and radium via coprecipitation with hydrated manganese oxides. Andy assisted with Rockford manganese removal pilot study and has reviewed numerous pilot studies for full-scale integration. He has also assisted several communities, serving as a technical advisor, in the evaluation of options for addressing issues with disinfection by products.

Andy has extensive experience with iron and manganese removal.

Michael J. Forslund, P.E.

AREAS OF EXPERTISE

- Environmental Engineering
- Water Supply
- Water Resources

PROFESSIONAL EXPERIENCE

Municipal Well Facilities including design and construction observation, well site investigations, test well drilling, alignment testing, and pump testing. Deep well designs to 1,500-foot-deep rock wells including casing placement, aquifer analysis, and capacity evaluation. Well exploration experience includes test borings and test wells for shallow aquifer wells and analysis of geologic data. Shallow well designs for sand and gravels wells; well screens, gravel pack, and monitoring wells. Wellhead protection plans for new and existing wells.

Water Storage Facilities including design and construction observation of elevated tanks, ground-level tanks and below-grade reservoirs and elevated tank painting. New design experience includes tank siting, sizing, evaluation of service areas and alternative bids for various elevated tank sizes and styles. Elevated tank painting experience includes tank inspection and evaluation of existing coatings; alternatives analysis for coating systems; cellular antenna accommodations, observation of surface preparation and coating application.

Water Treatment Facility design and construction observation including new ion exchange softening facilities for radium removal; iron and manganese removal with pressurized and gravity filtration; radionuclide removal with enhanced iron filtration and radium specific resin; and aeration units for radon removal. Pilot studies for radium removal using hydrous manganese oxides and radium specific resin.

Water System Studies including evaluation of existing facilities, demand analysis and projections, water system needs assessments, and development of capital improvement plans. Field measurement of fire flow and C-factor conditions.

Computer Modeling of water distribution systems, including analysis of water main extensions, new sources of supply and storage, and evaluation of entire systems for fire flow and service area pressure. Experience with WaterGEMS V8 XM, WaterCad, Pipe2000, KY Pipe, and MikeNet.

Pump Design including pump selection, piping layouts with valves and metering, and other equipment considerations. Design experience includes well pump design, booster pump and station design, intermediate pumping facilities, and hydraulic analysis.

Wastewater Treatment Facility design including aerobic digestion, sludge pumping, tertiary filter design, UV system evaluation, site piping, and building layout.

PRESENTATIONS

- Wisconsin Water Association, Annual Conference 2002 – The Importance of Pressure Testing Water Main
- Wisconsin Water Association, Annual Conference 2009 – Elevated Tank Repainting: Coatings, Coverage, Containment, Cost Comparisons, and Cellular Considerations
- Wisconsin Water Association Annual Conference 2010 – Ground-Level Water Storage: Adding Flexibility to Your Water System
- Wisconsin Water Association Annual Conference 2011 – Disinfection Byproducts in a Groundwater System

YEARS OF EXPERIENCE

16

YEARS WITH FIRM

16

EDUCATION

B.S. Environmental Engineering – Michigan Technological University-Houghton, 2000

REGISTRATION

Professional Engineer in Wisconsin, Illinois, and Michigan

STRAND ASSOCIATES®

Michael J. Forslund, P.E.

- Wisconsin Rural Water Association Annual Conference 2015 - Chlorine Disinfection: Free? Total? What Does it All Mean?

PROFESSIONAL AFFILIATIONS

- Wisconsin Water Association – Vice Chair 2016; Senior Trustee 2015; Board of Trustees, 2011, 2012, 2013, 2014 Membership Committee Chair, 2004, 2005, 2006, 2007
- American Water Works Association
- Water Environment Federation

Ryan D. Wood, P.E.

AREAS OF EXPERTISE

- Water Resources
- Water Treatment
- Water Supply
- Water Storage Tank Design and Inspection
- Municipal Engineering Services

PROFESSIONAL EXPERIENCE

Water Treatment experience includes chemical feed and treatment system design and construction observation for arsenic, iron, manganese, radium, and volatile organic compounds. Treatment systems utilized includes absorption, adsorption, air stripping, chemical dosing, and filtration.

Water Quality Remediation Studies and Reports for Water Systems experience includes pilot set-up, daily maintenance, sampling, water chemistry testing, and data analysis. Reports include contaminant removal goals, overall treatment process, sampling methods, data analysis, conclusions, and recommendations for full-scale design.

Facility Design and Construction includes design, project management, and construction observation experience for well, booster station, treatment plant, utility garage, and administration office facilities.

Hydraulic experience includes submersible turbine, centrifugal, positive-displacement, grinder, and other potable water and sludge waste pumps. Hydraulic experience also includes storm, sanitary, and water main design and construction observation.

Water System experience includes knowledge of regional aquifer characteristics and bedrock geology, well siting, wellhead protection and computing water system modeling and analysis of water distribution systems using WaterCAD and WaterGems programs. Modeling experience includes model assembly, calibration, and steady-state modeling. Models used to aid engineering decisions regarding current and future water distribution system needs.

Project Management and Construction experience includes reviewing and processing construction documents and assisting with required loan documents. Additional involvement includes construction observation duties for wells, well rehabilitation and testing, water main, pumping stations, water treatment removal facilities, wastewater treatment plants, and booster stations.

Water Storage Tank experience includes preparing contract documents both new storage facilities and rehabilitation of existing storage facilities. Involvement also includes climbing and inspecting elevated and ground-level storage tanks, preparing inspection reports, and preparing and submitting all necessary related agency forms. Experience also includes reviewing proposed cellular modifications and additions on water towers and conducting field observations of corresponding work.

Municipal Engineering Services includes serving as the Village Engineer for Capron, Illinois. Involvement includes capital improvement and maintenance planning, reviewing development projects and other Village related duties. Experience also includes reviewing development and stormwater submittals for other municipalities

PROFESSIONAL AFFILIATIONS

- American Water Works Association (AWWA)
- 2012 Wisconsin Section AWWA Young Professional of the Year

YEARS OF EXPERIENCE

10

YEARS WITH FIRM

10

EDUCATION

B.S. Civil and Environmental Engineering – University of Wisconsin-Madison, 2006

REGISTRATION

Professional Engineer in Wisconsin and Illinois

STRAND ASSOCIATES®

Andy L. Mullendore, P.E.

AREAS OF EXPERTISE

- Municipal and Industrial Water Supply Planning and Distribution
- Pumping Station Design
- Well Testing Rehabilitation and Design
- Water Treatment Design
- Distribution System Modeling
- Construction Engineering

PROFESSIONAL EXPERIENCE

Supply System Studies for communities in Wisconsin and Illinois have included distribution system computer analysis, unidirectional flushing programs, demand analysis, storage capacity analysis, supply capacity analysis, and development of improvement alternatives for the water supply, storage, treatment, and distribution system.

Computer Analysis of water distribution systems has included the collection of field data, including fire flow testing, C-factor testing, and field capacity testing of existing pumping equipment. Experience includes model assembly, calibration, steady state modeling, extended time, modeling, and water quality modeling for evaluating various types of water distribution system improvements, such as water mains, supply sources, and storage, utilizing various computer modeling programs, including, EPANET, WaterGems, and KYPipe.

Well and Treatment Design for deep rock wells and shallow sand and gravel wells have included well siting survey, site layout, wellhead protection, well rehabilitation, and associated distribution system improvements. Experience includes more than 25 pumping station, well, well house, reservoir, and treatment plant projects, and more than five elevated tank projects. Treatment experience includes iron, manganese, and radium removal using sand and gravel, anthracite, green sand, and pyrolusite media and removal of volatile organics utilizing granular activated carbon and air stripping. This experience includes working on both new and existing facilities.

Pump Design experience includes vertical turbine line shaft well and booster pumps, submersible well pumps, and centrifugal booster pumps in new and existing facilities. Experience with design of vacuum priming systems and net positive suction head evaluations.

Project Manager for water main, raw and finished water pumping stations, well house, booster station, water softening, HMO radium removal, iron and manganese removal, elevated tanks, and reservoir design.

Construction Engineering experience includes staking, observation, and project administration for wells, water main, pumping stations, iron and manganese removal facilities, HMO radium removal, elevated tanks, booster stations, and reservoirs.

PRESENTATIONS

- Modeling Water Quality in Distribution Systems: Issues and Case Study, presented at AWWA – Wisconsin Section – Annual Conference (September 1996) and AWWA – Illinois Section 1st Annual Computer
- Monitoring the Health of Your Wells and Pumps, presented at WRWA – Annual Conference (April 2008)

PROFESSIONAL AFFILIATIONS

- American Water Works Association
  - Regulatory Committee

RECOGNITION

- Wisconsin Section – American Public Works Association – Project of the Year 2007 – Janesville Pumping Station No. 12

YEARS OF EXPERIENCE

23

YEARS WITH FIRM

23

EDUCATION

B.S. Civil/Environmental Engineering – University of Wisconsin-Platteville, 1993

REGISTRATION

Professional Engineer in Wisconsin, Illinois, and Alabama

STRAND ASSOCIATES®

Firm Experience

Vast Experience with Iron and Manganese Removal Allows Kronenwetter to Proceed with Complete Confidence

We provide specialized services in the fields of civil and environmental engineering. Since 1946, we have been helping clients resolve their needs in the areas of water supply, transportation, municipal, electrical, mechanical, facilities, and wastewater engineering. This has enabled us to build a reputation for quality engineering and personnel that extends throughout the Midwest.

Water supply is a major focus of our environmental division.

Pilot Testing Protocols and Pilot Testing

Our team has extensive experience with pilot testing protocols and pilot testing. For several of our water treatment plant projects, pilot testing has been necessary. We work with owners to define the pilot protocol while taking into account existing water quality concerns, anticipated operational constraints, and scheduling requirements. We are heavily involved in the pilot testing process, especially at start-up and shut-down, and we typically provide full pilot reports with recommendations. Additionally, in some circumstances where pilot vendors have been tasked to write the pilot summary report with recommendations, we have provided independent peer reviews of those recommendations and conclusions.

We are heavily involved in the pilot testing process, especially at start-up and shut-down, and we regularly provide full pilot reports with recommendations.

Pilot Testing Protocols and Pilot Testing	
Location	**Process**
Channahon, IL	Radium Removal Using HMO Coprecipitation
Merrill, WI	Manganese Removal
Loves Park, IL	Radium Removal Using HMO Coprecipitation
Portage, WI	Iron Removal
Columbus, WI	Iron Removal
Rockford, IL	Radium/Iron/Manganese Removal At Three Sites
Logan Todd, KY	Membrane Filtration
Paintsville, KY	Membrane Filtration
Decatur, IL	Nitrate Removal via RO
Fond du Lac, WI	Radium Removal Using Selective Medians
Algoma, WI	Radium Removal Using HMO Coprecipitation
Bristol, WI	Radium Removal Using HMO Coprecipitation
Joliet, IL	Radium Removal Using HMO Coprecipitation Proprietary Medias, and Selective Medias
Hustisford, WI	Radium Removal Using HMO Coprecipitation

In addition to pilot testing services, below is a representative listing of several of the groundwater treatment plants on which we have provided engineering services. Included are the sizes of the plants and the types of treatment.

Representative Listing of Strand Groundwater Treatment Plant Experience		
Client	**Capacity (mgd)**	**Type**
Algoma, WI (3 plants)	0.7 each	Installation of hydrous manganese oxide (HMO) treatment and pressure filter for iron, arsenic, and radium removal
Bristol, WI	1.0	Installation of HMO treatment and pressure filter for iron and radium removal
Belvidere, IL	2.9	Iron removal with pyrolusite filtration

Representative Listing of Strand Groundwater Treatment Plant Experience		
Client	**Capacity (mgd)**	**Type**
Campbellsport, WI (retrofit)	1.2	Enhanced radium removal with manganese oxide addition to existing iron and manganese removal plant
Channahon, IL (2 plants)	1.5	Cofiltration iron and radium using HMO, pressure aeration, and filtration
Channahon, IL	3.0	Radium removal with enhanced iron removal and future ion exchange
Columbus, WI	1.1	Iron and manganese removal and zeolite softening
Dixon, IL	2.5	Radium Removal (at Dixon Correctional Center using ion exchange with iron removal pretreatment)
Dubuque, IA (modifications)	20.0	Iron removal and softening by lime addition, clarification, and filtration
Fond du Lac, WI (4 plants)	7.0 (2) 1.0 (2)	Radium, arsenic, iron, and manganese removal with HMO and pressure filtration.
Iowa American Water Company, Clinton, IA Well 10 and 11	3.53	Installation of HMO treatment and pressure filter for iron and radium removal
Joliet, IL (12 plants)	1.5-9.0	Cofiltration iron and radium using HMO, pressure aeration, and filtration
Loves Park, IL (2 plants)	1.5 and 2.2	Radium removal with enhanced iron removal and future ion exchange
Madison, WI	3.0	Manganese Removal with pyrolusite pressure filtration
Mercer, WI	0.5	Iron removal by pressure filtration
Merrill, WI	2.6	Manganese and iron removal with pyrolusite pressure filtration
Middleton, WI (2 plants)	2.0	Iron removal by pressure filtration and disinfection
Onalaska, WI	3.9	Iron and manganese removal with pressure filtration
Platteville, WI	1.4	Iron removal with oxidation and sand filtration
Rockford, IL (2 plants)	6.0 - 7.2	VOC removal by granular activated carbon
Rockford, IL (10 plants)	1.5-4.0	Radium, iron, manganese removal using pressure aeration, and filtration using chlorine and HMO
Whitewater, WI (2 plants)	1.5	Iron removal by pressure filtration

By selecting our firm for the Well No. 2 Pilot Treatment Plant Study, the Village will gain a partner with a strong background in projects of similar complexity and with similar success factors. Brief descriptions of a few of our pilot testing projects are listed below.

By selecting our firm for the Well No. 2 Pilot Treatment Plant Study, the Village will gain a partner with a strong background in projects of similar complexity and with similar success factors.

Manganese Reduction Study and Treatment System Design – Merrill, WI

We have provided water quality evaluations for the City of Merrill dating back to the 1970s. Our studies have documented water quality changes over time, including elevated levels of manganese in the City's shallow sand and gravel wells. In 2010, the City started receiving an increased number of complaints of black water and stained plumbing fixtures associated with high manganese concentrations. The City hired us to complete a Manganese Reduction Study with the following scope of services:

- Review of existing water quality data.
- Summary of notable water quality trends.

- Evaluation of feasible treatment options, including gravity filtration, pressure aeration and filtration, and the need for chemical oxidants.
- Evaluation of alternative filter media.
- Recommendation of a process approach for manganese removal.
- Preparation of a tentative implementation schedule for the selected alternative.

We have provided water quality evaluations for the City of Merrill dating back to the 1970s.

Following completion of the manganese treatment evaluation, we were hired to provide design, bidding, and construction-related services for a manganese filtration facility, associated water main, and various well-house improvements.

Merrill fiter vessel.

Merrill's central treatment facility receives and treats water from three City wells.

The manganese treatment evaluation looked at individual treatment facilities at each City well and centralized treatment. We evaluated several options for oxidation, including air, permanganate, and chlorine. The evaluation also recommended media and loading rates to be piloted.

The design included a central manganese treatment facility built as an addition to the City's existing water utility building. The treatment facility was designed to treat water from three of Merrill's wells on the east side of the city. Raw water transmission main was designed to deliver water from each well to the new treatment facility.

Raw water transmission main was designed to deliver water from each well to the new treatment facility.

This alternative was found to be much less expensive than constructing three separate filtration facilities. Operation and maintenance of one facility will be much less labor intensive for the Water Utility staff.

The piloting requirements for the project were included with the full-scale water treatment plant construction documents. The project included 2-week pilots at Wells No. 1 and 5, as they had significantly different water quality parameters. The pilot included filter columns for a manganese coated media and a pyrolusite media. A benefit of the selected piloting options was that permanganate was not needed as an oxidizing agent. Permanganate typically works well for oxidizing manganese, but Merrill wished to avoid the need for another chemical feed room and the handling of a hazardous chemical.

The treatment system is sized to receive a raw water flow of 1,800 gpm. The filter uses a pyrolusite-based media that requires only chlorine for preoxidation of manganese.

The design of the treatment facility and water main was split into two construction contracts. Each design was fast-tracked to meet the submittal deadline of the Safe Drinking Water Loan Program. This allowed the City to utilize the principle forgiveness component of the loan program and saved the City substantial money.

We assisted the City with contract administration and onsite observation during construction.

Bids were opened for the treatment facility and water main projects at the same time in December 2011. Construction began in early 2012. We assisted the City with contract administration and onsite observation during construction. The water main and facility were completed by the end of 2012, and the treatment system is providing more than 90 percent manganese removal.

Table 2: Iron and Manganese Treatment Effectiveness – Certified Lab Results

Merrill Well #1

	Iron Content (mg/L)			Manganese Content (mg/L)		
Date	Raw	Column 1	Column 2	Raw	Column 1	Column 2
2/20/2012	0.054	ND	ND	1.16	0.0046	0.0044
2/21/2012	0.033	ND	ND	1.03	0.0056	0.005
2/22/2012	0.049	0.01	ND	1.27	0.0048	0.0047
2/23/2012	0.049	0.011	ND	1.23	0.0042	0.0038
2/24/2012	0.119	ND	ND	1.29	0.0015	0.0017
2/27/2012	0.079	ND	ND	1.26	0.0036	0.0036
2/28/2012	0.065	ND	ND	1.27	0.0014	0.0016
2/29/2012	0.073	ND	ND	1.25	0.001	0.002
3/1/2012	0.048	ND	ND	1.24	0.0048	0.0046
3/2/2012	0.057	ND	ND	1.28	0.0014	0.0016
Average	0.063	<0.010	<0.010	1.23	0.0033	0.0033
% Removal		>84%	>84%		99.80%	99.80%

Merrill pilot proved effective iron and manganese removal.

Infrastructure Improvement Program – Rockford, IL

We were selected to participate in the City of Rockford's $75,000,000 upgrade of their water system. A major component of this upgrade included iron, manganese, and radium removal treatment at 11 existing well facilities. Prior to conducting the design and construction engineering services for these projects, a comprehensive pilot testing effort was performed as detailed below.

- **Pilot Testing**

  A detailed Pilot Testing Protocol was developed and submitted to IEPA for evaluation. The approved Protocol was then used as the basis for obtaining the services of equipment vendors. Three treatment equipment vendors were selected to further develop their processes for application in Rockford. The testing was performed at Wells 5A, 29, and 30.

  All pilots included pressure aeration to meet any naturally occurring oxygen demand, oxidize dissolved iron, and begin oxidation of dissolved manganese. Sodium hypochlorite was also fed ahead of each filter. Wells 29 and 30 contain natural radium levels above the mcl. At each of these facilities Hydrous Manganese Oxides (HMO) were tested for reduction of radium. Two alternative approaches were used for application of HMO. In one set of pilots performed, HMOs were tested and in the other pilots, in-situ mixed HMO were tested.

  Well 5A had the highest manganese concentrations (0.2 mg/L) combined with high iron levels (2.0 mg/L) within the City's primary wells and was included in the pilot protocol to test the limits of the treatment processes regarding those two parameters.

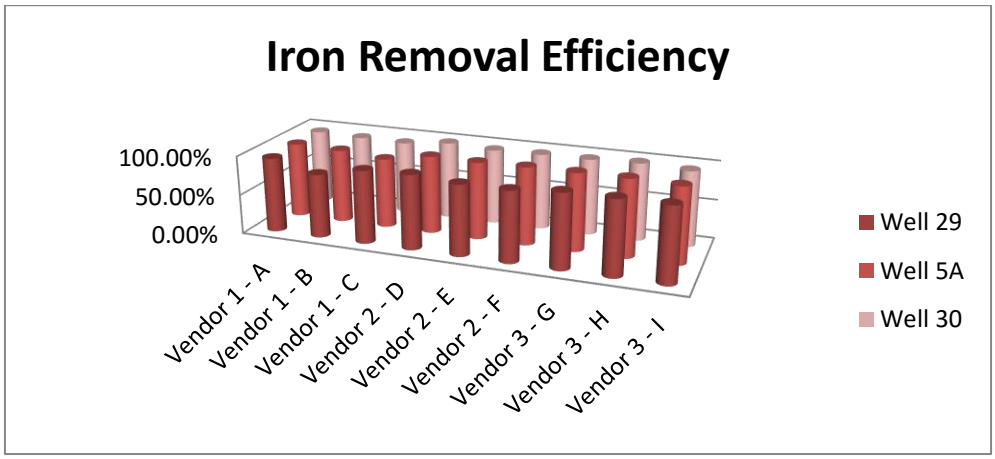
Filter columns consisted of standard anthracite over sand and proprietary media. Others consisted of just anthracite. Proprietary media included manganese dioxide and manganese coated carbon. All pilots were run for several weeks while testing for removal efficiency of the various combinations of treatment technologies.

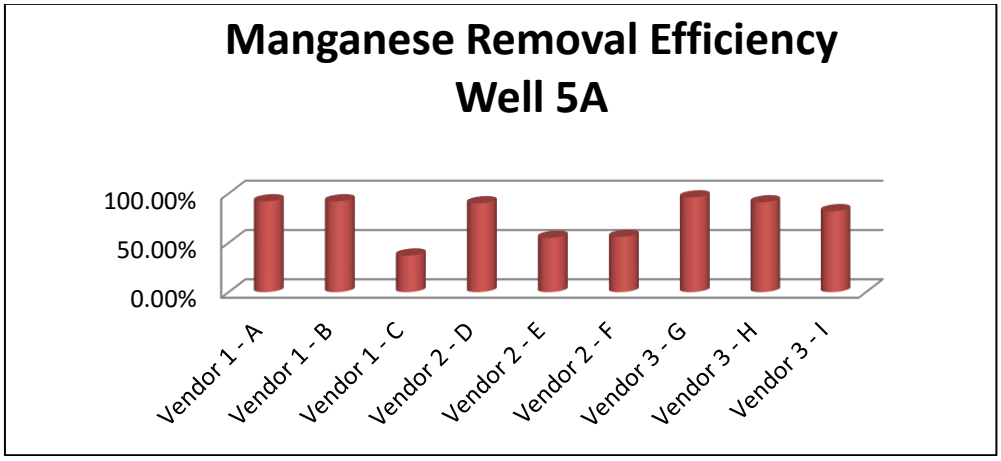
	Vendor 1-A	Vendor 1-B	Vendor 1-C	Vendor 2-D	Vendor 2-E	Vendor 2-F	Vendor 3-G	Vendor 3-H	Vendor 3-I
HMO System	In-situ	In-situ	Strand In-situ	Premixed	Premixed	Strand In-situ	Premixed	Premixed	Strand In-situ
Media-type	GSR	GSR	S/A	S/A	MNO^2	S/A	Anthra	Anthra	S/A
Filter Rate (GPM/SF)	5.0	7.0	5.0	8.0	4.5	4.5	4.0	5.0	5.0

- GSR – Synthetic, manganese dioxide coated media.
- S/A – Sand and anthracite
- MNO_2 – Manganese dioxide media
- Anthra – Sand and MNO_2 coated anthracite

Each media was tested to determine its ability to remove the targeted parameters of iron, manganese, and combined radium. The results were plotted and evaluated together to develop systemwide recommendations. Review of the following data plots shows significant differences between the performance of some of the systems. This information was used by the equipment vendors to prepare their bids for the 11 full-scale plants.

Each media was tested to determine its ability to remove the targeted parameters of iron, manganese and combined radium.

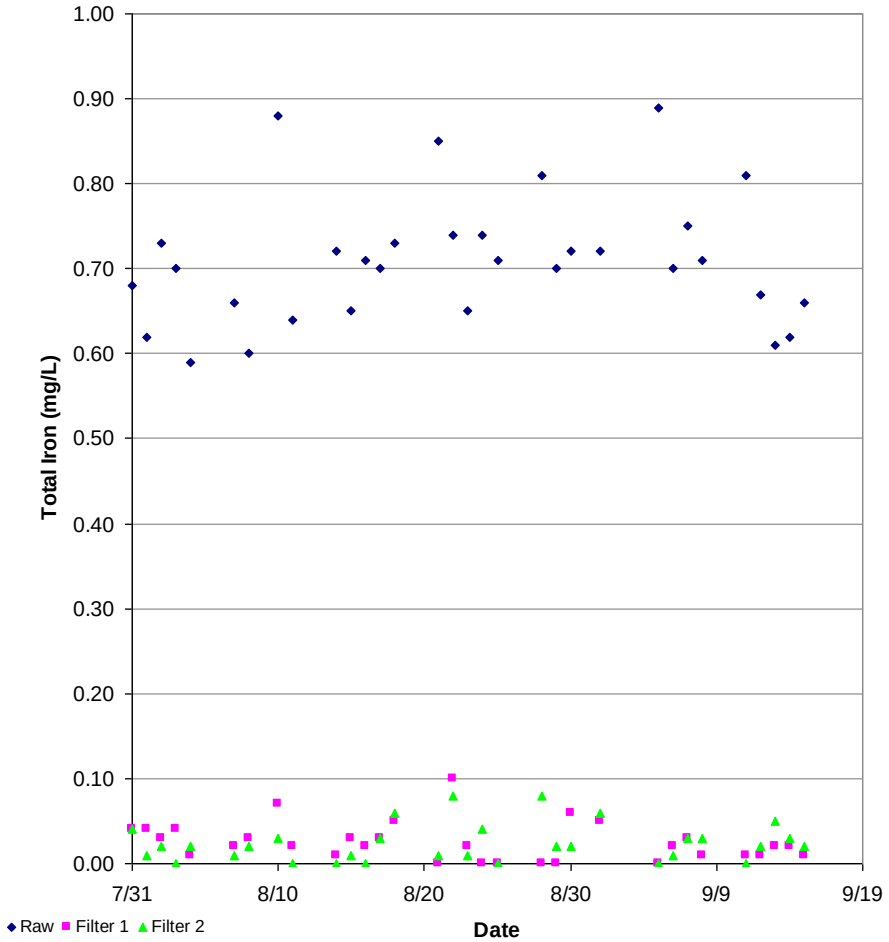




Well No. 3 – Bristol, WI

The Town of Bristol realized the need for additional water supply and hired us to complete all phases of its Well No. 3 project. Once the well was drilled and tested, water quality analyses confirmed our initial assumption that iron and radium removal was needed. We assisted the Town by developing an action plan that included a radium treatment evaluation, pilot testing protocol, and pilot testing report. Our evaluation presented the pros and cons of various treatment techniques and associated costs. Results of the evaluation were used to select HMO addition as the chosen method for radium reduction.

We assisted the Town by developing an action plan that included a radium treatment evaluation, pilot testing protocol, and pilot testing report.



Bristol pilot plant successfully removed iron in both treatment columns.

The 750 gpm well facility was designed with a horizontal pressure filter, HMO feed system, tablet chlorination, backwash detention, and standby power.

Pilot testing equipment was provided by Tonka and operated for 7 weeks by Village staff. Members of Tonka staff and our project team were on-site periodically to monitor the progress and to assist in taking samples. The pilot consisted of two independent down-flow filters operating at a loading rate of 3 gpm/sf. One pilot consisted of Tonka's proprietary IMAR media and the other pilot consisted of standard sand and anthracite media.

Results of the pilot testing showed radium and iron removal efficiencies greater than 90 percent for both pilot systems. The IMAR media was chosen for full-scale operation.

As Project Manager, Mike Forslund led the project team and also served as the Lead Process Engineer throughout all phases of this project.

Below are three projects/studies completed by the proposed project team.

Name of Client/Owner	City of Merrill, Wisconsin
Project /Study Name and Date of Completion	Manganese Reduction Study and Treatment System Design, 2010
Contact Name, Telephone Number, E-mail Address	Kim Kriewald Utilities Manager, Merrill, Wisconsin Phone: 715-536-6561 E-mail: kim.kriewald@city.merrill.wi.us

Name of Client/Owner	City of Rockford, Illinois
Project /Study Name and Date of Completion	Iron, Manganese, and Radium Removal Pilot Study, 2007
Contact Name, Telephone Number, E-mail Address	Tim Holdeman (former Water Superintendent) Director of Public Works, DeKalb, Illinois Phone: 815-748-2332 E-mail: tim.holdeman@cityofdekalb.com Kyle Saunders Water Superintendent, Rockford, Illinois Phone: 779-348-7371 E-mail: kyle.saunders@rockfordil.gov

Name of Client/Owner	Village of Bristol, Wisconsin
Project /Study Name and Date of Completion	Well No. 3, 2006
Contact Name, Telephone Number, E-mail Address	Randy Kerkman Village Administrator, Bristol, Wisconsin Phone: 262-857-2368 E-mail: bristoladmin@wi.rr.com

Project Fee

We Will Efficiently Work with the Village to Deliver Exceptional Value

The fees for the pilot study are broken down by engineering, pilot vendor, and laboratory costs.

- **Part A – Engineering Fee**
  We have carefully reviewed the Village's suggested scope and the associated level of effort to efficiently implement the project outlined in the RFP. Our proposed lump sum fee for the Well Number 2 Pilot Treatment Plant Study, as outline in this proposal, is $16,400.

- **Part B1 – Pilot System Vendor**
  We have successfully worked with many different filtration equipment vendors on pilot scale testing. We will assist the Village in contracting with the selected vendor. Based on our initial contact with multiple vendors and the schedule identified in the RFP, we suggest utilizing ATEC Systems as the pilot system vendor. ATEC Systems provided the shortest lead time and reasonable cost. The cost for piloting is estimated at $12,500.

- **Part B2 – Laboratory Fees**
  We suggest budgeting $2,500 for laboratory fees. Actual fees will be dependent on final scope of the sampling and level of lab verification required.

The total cost for all parts of the pilot treatment study is estimated to be $31,400.

Alternative approach focuses Village resources where needed most and saves money.

We recommend the Village consider an alternative approach as described starting on page 6 of the *Project Understanding and Approach* section. The approach focuses on preliminary engineering tasks that will better define the project, associated costs, and obtain initial agency approvals. Piloting is not included in the preliminary engineering stage, but will be included in subsequent stages when the appropriate level of planning is complete.

The total cost for our alternative approach is $19,500.

Our proposed lump sum fee for the alternative approach is $19,500.

KRONENWETTER - MTSLLC

OIC Report
August 2016

OPERATOR COMMENTS

A) Meter Exchange Program

During the month of August, we reached 137 meter change outs for the year. This is the second year of the exchange program; along with replacing the meter we have also been upgrading the remote reader outside of the house to a radio read. We hope to have at least 300 dwellings completed by the end of the year.

B) Sewer Main Back up - Winterhaven

On Sunday evening August 28 the PD received a call on a sewer backup. After several telephone calls were placed we responded with two operators. A third operator was called out to assist when we found out there had been some property damage.
The sewer is a single, dead end pipe running south off the Pine Interceptor sewer. There are four customers on the line, two of which had some back up into their basements. Within an hour of getting the call we had located the issue, responded with the jetter and opened the blockage. On Tuesday we returned and did some additional flushing to make sure the line was clean.
With only four customers on a line the flow is pretty low and sometimes conditions are just right for solids to drop out, the liquids pass by, for a time anyway, until enough solids collect and the flow stops. Sometimes the accumulation of water behind the plug will move it downstream – in others like this one the plug remains tight creating a backup.

C) Clogged Lift Station Pumps

During the month of August, we had to pull pump 2 at Lift Station 11 due to rags clogging the pump.

D) Private Wells

This year the private well inspection count is modest, in the 120 range. Recently reminder postcards were sent out to about 40 customers who have not yet made an appointment for the inspection/water test.

E) Low Pressure Concern

During the past two months we have been working on a low pressure/flow concern at 865 Pinedale. For the past four years operating one fixture in the dwelling has not been a problem, but two uses drains the pressure/flow to low levels. Recently a plumber addressing a different issue advised the customers that the condition was not normal.
We have tried various tactics to determine the cause. The first item to check was making sure the curb stop box was fully open. However we have not been able to get on the valve, utilizing all the tricks possible. We finally dug the curb stop up, initially to get down far enough to try and straighten the curb stop box. Ultimately we dug all the way to the bottom and removed the box to operate the valve by hand. When doing so we found the curb stop box valve stem was broken. When we replaced the valve we found the old valve only open a crack. (photos attached).

F) SCADA System

The operator PC in the SCADA system has been acting up. Periodically it freezes up and we have to re-boot it. This PC is not the one running the system controls, but it is the one that allows the operator to see what's happening and make adjustments to the system operations.

G) THE SNAKES

The snakes have returned to the LS No. 11 wet well. Last year we installed a number of screens on vents etc., so we do not believe they are entering the sewer system at the lift station. We suspect here is an open cleanout or a manhole frame offset, some place open for them to drop in. The snakes are not the real issue, if snakes can get in so could clear water flows. We have walked the sewer lines in easements areas but have not spotted any issues. Our next approach would be to pump smoke into the system and look for any escaping fumes. It can be an alarming process to the customers so we want to get some direction from the Village before doing so.

H) Sewer Lateral Backup 2235 Bryce

We have investigated a couple sewer backups at 2235 Bryce. The customer has had two over the past several years. The customer's wye is just several feet from a dead end manhole. We have been able to use a mirror and look down the sewer line and have seen its clear. The other three units in this building (all four have the same basement elevation) have not experienced any backups. We have concluded the backups are related to the dwelling building sewer and not the main line.

2) Customer Count

During the month of August; seven new residential customers and a clear water meter were added to the system.

3) WATER PUMPED

Water pumped in August decreased by 1.5 million gallons.

TEMPORARY USERS

Flushing Winterhaven sanitary sewer 3,000 gallons (estimate).

4) WASTEWATER FLOWS

Wastewater flows for July increased by 780,000 gallons.

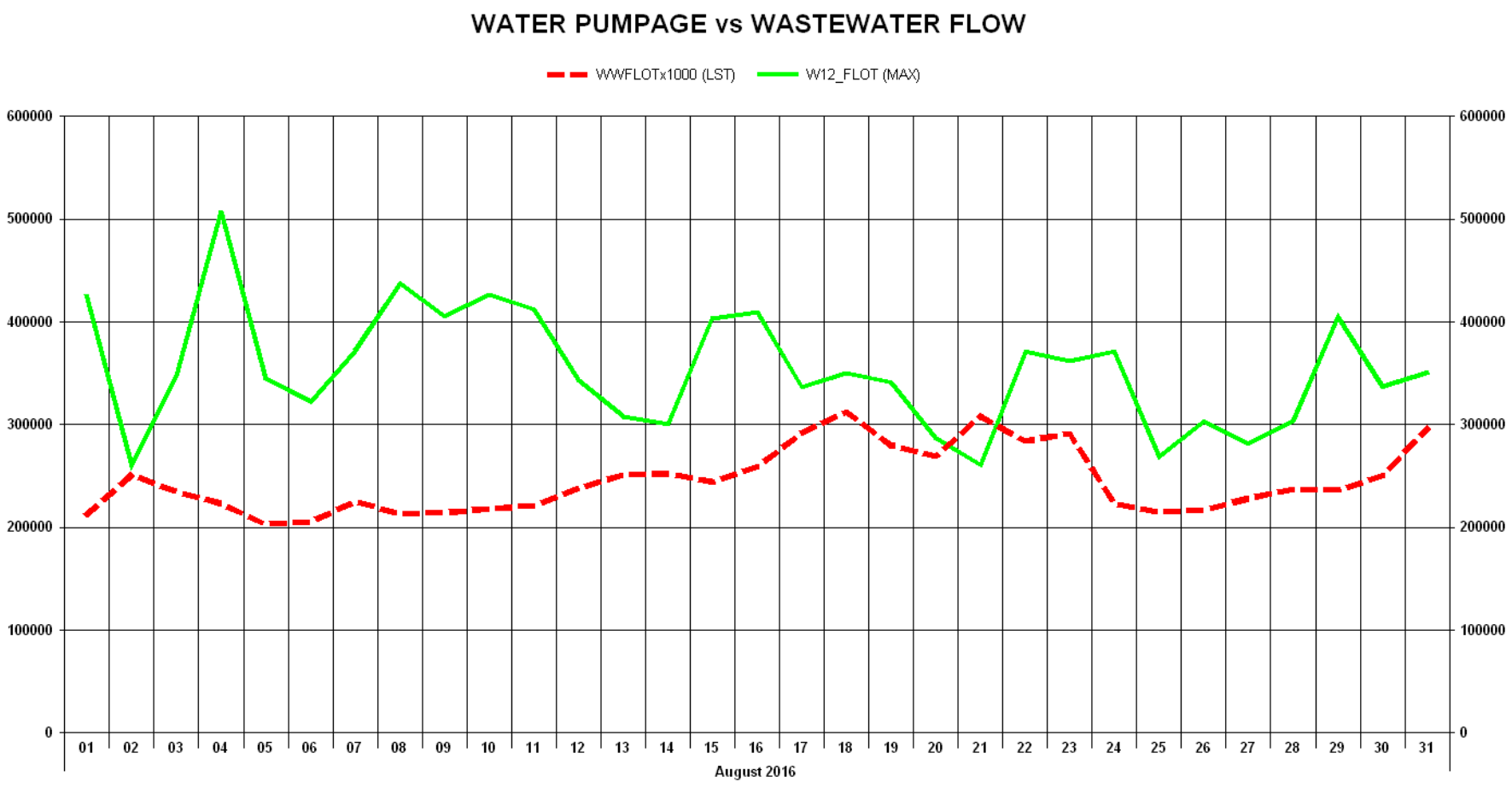
With the decrease in water pumped and the increase in wastewater flows the lost water ratio increased to 87%.

It's hard to make sense of the numbers – we have more customers residential and commercial – but the commercial is water use only so water use should be up not down – the weather has been wetter so less outdoor uses – with the wetter weather there could be an increase in clear water flows. Again we will have to see several months of data to see what trends are really happening.

5) LIFT STATION HOURS

	PUMP 1 HOURS Previous/Current		**PUMP 2 HOURS** Previous/Current	
LS NO. 1 (Tower @ Seville)	66	74	69	77
LS NO. 2 (Rollingwood)	81	89	75	85
LS NO. 3 (Tower @ McAddoe)	36	50	39	46
LS NO. 4 (West Nelson)	110	123	80	93
LS NO. 5 (Cedar)	53	60	55	60
LS NO. 6 (River Forest)	21	24	26	23
LS NO. 7 (Gate of Heaven)	47	54	47	53
LS NO. 8 (Paper Pl.)	113	123	66	69
LS NO. 9 (West Rd.)	48	57	99	101
LS NO. 10 (Sussex Pl.)	7.2	8.1	6.4	5.9
LS NO. 11 (Timber Creek)	52	58	67	74

Attachments: Water Flow Chart & Pumpage / Customer Count Tables


WATER PUMPAGE vs WASTEWATER FLOW
WWFLOTx1000 (LST)
W12_FLOT (MAX)
600000
500000
400000
300000
200000
100000
0
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
August 2016

2016	Resid	Clearwater	Comm	Industrial	Public	E/W Total	TOTAL
Jan							
East	0	0	0	0	0	1662	
West	0	0	0	0	0	432	**2094**
Feb							
East	0	0	0	0	0	1662	
West	0	0	0	0	0	432	**2094**
March							
East	0	0	0	0	0	1662	
West	0	0	0	0	0	432	**2094**
April							
East	**4**	0	0	0	0	1666	
West	**1**	**1**	0	0	0	434	**2100**
May							
East	**3**	0	0	0	0	1669	
West	0	0	0	0	0	434	**2103**
June							
East	**2**	**2**	0	0	0	1673	
West	0	0	0	0	0	434	**2107**
July							
East	**12**	**2**	0	0	0	1687	
West	0	0	0	0	0	434	**2121**
August							
East	**7**	0	0	0	0	1694	
West	0	**1**	0	0	0	435	**2129**
East Total	**1531**	**107**	**53**	**0**	**3**	**1694**	
West Total	**359**	**28**	**40**	**7**	**1**	**435**	
TOTAL 2016	**1890**	**135**	**93**	**7**	**4**		**2129**

Water Pumpage

2016	Well 1	Well 2	Total	Ave. Day	Ave. Day/cust
Jan	4,230,000	3,239,000	7,469,000	240,935	115
Feb	3,742,000	3,692,000	7,434,000	256,345	122
Mar	4,648,000	4,398,000	9,046,000	291,806	139
Apr	4,871,000	4,091,000	8,962,000	298,733	142
May	6,332,000	5,412,000	11,744,000	378,839	180
Jun	5,750,000	4,996,000	10,746,000	358,200	170
Jul	6,557,000	5,737,000	12,294,000	396,581	187
Aug	5,391,000	5,335,000	10,726,000	346,000	163
TOTAL	41,521,000	36,900,000	78,421,000		

2016	East	Ave. day	West	Ave. day	Total	Ave. day
Jan	5,680,000	183,226	2,580,000	83,226	8,260,000	266,452
Feb	4,950,000	159,677	2,290,000	73,871	7,240,000	258,571
Mar	5,780,000	186,452	2,840,000	91,613	8,620,000	287,333
Apr	5,860,000	189,032	2,880,000	92,903	8,740,000	291,333
May	5,840,000	188,387	2,510,000	80,968	8,350,000	269,355
Jun	5,450,000	175,806	2,520,000	81,290	7,970,000	265,667
Jul	6,120,000	197,419	2,450,000	79,032	8,570,000	276,452
Aug	6,890,000	222,258	2,460,000	79,355	9,350,000	301,613
TOTAL	46,570,000	1,502,258	20,530,000	662,258	67,100,000	

Water Pumpage vs Wastewater Flow

2016	Wastewater	Water Pumped	Ratio
Jan	8,260,000	7,469,000	111%
Feb	7,240,000	7,434,000	97%
Mar	8,620,000	9,046,000	95%
Apr	8,740,000	8,962,000	98%
May	8,350,000	11,744,000	71%
Jun	7,970,000	10,746,000	74%
Jul	8,570,000	12,294,000	70%
Aug	9,350,000	10,726,000	87%
TOTAL	67,100,000	78,421,000	86%

Director of Public Works Report

September 6, 2016

RESIDENT CONCERNS

- Garbage missed on Helke Rd.
- Sewer backup on Winterhaven Place
- Sewer backup on Bryce Lane

ATTENDEND THE FOLLOWING MEETINGS:

- Marathon County EIF Grant August 10, 2016 (Grant approved 2016 $105,729 - 2015 $175,000)
- Several In House Budget Meetings

PUBLIC WORKS DEPARTMENT

- Installing Driveway Culverts
- Patching Roadway
- Assisted Seal Coating Contract (2016 seal coat projects completed)
- Center line painting
- Installing internal bike route signs

PUBLIC WORKS DIRECTOR ACTIVITIES

- PW/Parks 10 yr. Capital Budget submitted
- PW/Parks Operation Budget submitted
- Sewer & Water Operation & 10 yr. Capital Budget submitted
- Old Hwy 51 Multi-Use Trail –working with BHA on finial design
- Coordinating CMOM project with Clark – Dietz Sewer Utility
- Motor Grader Lease OR Purchase?
- RFP for Well # 2 Pilot Survey
- Water Utility Water System Policies
- Negotiations for access with Property owners to conduct test boring for Well # 3
- Field review of Everest Wood retrofit of existing infiltration pond (MTS)

PUBLIC WORKS DIRECTOR FUTURE ACTIVITIES

- Policy on hold for undeveloped roadways within existing dedicated public right of way.

Account Number		2016 July	2016 Actual 07/31/2016	2016 Budget	Budget Status	% of Budget
100-00-43000-003-545	Recycling Aid	0.00	26,782.17	26,198.00	584.17	102.23
100-00-43000-004-100	Environmental Impact Fees	0.00	34,627.00	34,627.00	0.00	100.00
100-00-44000-002-210	Sign Permits/Misc Lic/Permits	0.00	230.00	50.00	180.00	460.00
100-00-44000-002-900	Excavating Permits	800.00	4,900.00	1,500.00	3,400.00	326.67
100-00-46000-003-420	Garbage Collection Fees	246.34	290,554.85	290,644.00	-89.15	99.97
100-00-48000-002-200	Municipal Center & Park Rental	150.00	1,890.00	2,500.00	-610.00	75.60
100-00-48000-002-201	Athletic/Soccer Field Rental	0.00	540.00	0.00	540.00	0.00
100-00-48000-002-306	Sale of Scrap	77.40	427.40	500.00	-72.60	85.48
100-00-48000-002-441	Reimbursement for Road Repair	0.00	0.00	5,300.00	-5,300.00	0.00
PIC Revenues		1,273.74	359,951.42	361,319.00	-1,367.58	99.62
Total Revenues		1,273.74	359,951.42	361,319.00	-1,367.58	99.62

Account Number		2016 July	2016 Actual 07/31/2016	2016 Budget	Budget Status	% of Budget
100-00-53000-000-000	PUBLIC WORKS	0.00	0.00	0.00	0.00	0.00
100-00-53000-300-000	Engineering Costs	0.00	0.00	10,000.00	10,000.00	0.00
100-00-53000-301-000	Stormwater Permit Requirements	0.00	1,000.00	1,000.00	0.00	100.00
100-00-53000-302-000	PUBLIC WORKS DIRECTOR	0.00	0.00	0.00	0.00	0.00
100-00-53000-302-110	Salaries & Wages - PW Director	1,950.18	14,414.79	25,315.00	10,900.21	56.94
100-00-53000-302-111	FICA Tax - PW Director	149.00	1,100.78	1,937.00	836.22	56.83
100-00-53000-302-130	Health Insurance - PW Director	136.85	980.92	1,773.00	792.08	55.33
100-00-53000-302-131	EAP Fringe - PW Director	0.00	12.50	27.00	14.50	46.30
100-00-53000-302-132	Retirement (WRS) - PW Director	0.00	0.00	1,671.00	1,671.00	0.00
100-00-53000-302-322	Phone Expense - PW Director	40.00	240.00	480.00	240.00	50.00
100-00-53000-302-330	Mileage - Public Works	0.00	137.10	1,200.00	1,062.90	11.43
100-00-53000-302-340	Schooling, Training	0.00	370.00	1,500.00	1,130.00	24.67
100-00-53000-311-000	ROAD & STREET MAINTENANCE	0.00	0.00	0.00	0.00	0.00
100-00-53000-311-110	Salaries & Wages	16,627.39	145,191.14	261,075.00	115,883.86	55.61
100-00-53000-311-111	Wages-Part Time	0.00	1,817.23	5,717.00	3,899.77	31.79
100-00-53000-311-113	FICA Part Time	0.00	139.02	438.00	298.98	31.74
100-00-53000-311-114	Public Works Crew OT	0.00	5,884.49	21,566.00	15,681.51	27.29
100-00-53000-311-115	Public Works Crew OT FICA	0.00	431.26	1,650.00	1,218.74	26.14
100-00-53000-311-116	Public Works Crew OT Retiremen	0.00	388.38	1,424.00	1,035.62	27.27
100-00-53000-311-130	PW Employees Physicals	0.00	100.00	500.00	400.00	20.00
100-00-53000-311-131	Health Insurance	5,020.58	35,007.78	91,753.00	56,745.22	38.15
100-00-53000-311-132	Retirement - PW Crew Genl/Call	1,097.39	9,582.59	17,232.00	7,649.41	55.61
100-00-53000-311-134	SS FICA - PW Crew Gen/Call	1,224.78	10,743.47	19,974.00	9,230.53	53.79
100-00-53000-311-137	PW Crew EAP Fringe	0.00	75.00	135.00	60.00	55.56
100-00-53000-311-340	Workshops	0.00	0.00	300.00	300.00	0.00
100-00-53000-311-342	Salt/Brine	0.00	138,995.71	110,000.00	-28,995.71	126.36
100-00-53000-311-343	Dust Control	3,087.08	3,087.08	4,000.00	912.92	77.18
100-00-53000-311-344	Patching Material-Asphalt	21,121.19	23,072.03	40,000.00	16,927.97	57.68
100-00-53000-311-345	Seal Coating	0.00	0.00	180,000.00	180,000.00	0.00
100-00-53000-311-346	Crackfilling	20,000.00	40,000.00	40,000.00	0.00	100.00
100-00-53000-311-347	Pavement Marking	0.00	1,000.00	7,000.00	6,000.00	14.29
100-00-53000-311-348	Gravel & Road Base	0.00	5,825.40	40,000.00	34,174.60	14.56
100-00-53000-311-349	Capital - Road Improvements	13,983.60	28,169.35	128,000.00	99,830.65	22.01
100-00-53000-311-357	Culverts	2,900.20	12,158.84	5,000.00	-7,158.84	243.18
100-00-53000-311-358	Road Signs	244.00	1,123.70	5,000.00	3,876.30	22.47
100-00-53000-311-359	Bridge Inspections	0.00	0.00	1,500.00	1,500.00	0.00
100-00-53000-311-360	Storm Water	0.00	2,959.95	5,000.00	2,040.05	59.20
100-00-53000-311-380	Equipment Repairs	2,368.92	15,638.02	30,000.00	14,361.98	52.13
100-00-53000-311-381	Traffic Signal Maintenance	0.00	407.00	1,000.00	593.00	40.70
100-00-53000-311-382	Traffic Signal Major Repairs	0.00	0.00	8,000.00	8,000.00	0.00
100-00-53000-311-384	Gas & Oil	1,500.71	13,126.99	60,000.00	46,873.01	21.88
100-00-53000-311-385	Tires	99.00	1,374.96	4,000.00	2,625.04	34.37
100-00-53000-311-811	Outlay-Equipment	0.00	1,319.00	0.00	-1,319.00	0.00
100-00-53000-311-815	PW Non-Recurring Oper Expense	0.00	500.00	533.00	33.00	93.81
100-00-53000-312-326	Garage Utilities	243.74	5,231.92	14,000.00	8,768.08	37.37
100-00-53000-312-329	Uniforms & Safety Equipment	210.60	1,687.81	6,000.00	4,312.19	28.13
100-00-53000-312-354	Office Supplies	0.00	0.00	400.00	400.00	0.00
100-00-53000-312-355	Winter Maint-Plow Blades ETC	0.00	7,643.37	12,000.00	4,356.63	63.69
100-00-53000-312-356	Winter Damage-Mailboxes	0.00	93.18	1,500.00	1,406.82	6.21
100-00-53000-314-320	Garage Supplies & Expenses	893.02	10,186.12	15,000.00	4,813.88	67.91
100-00-53000-314-422	Weather Sirens	0.00	762.10	0.00	-762.10	0.00
100-00-53000-315-420	Street Lighting	0.00	23,300.98	50,000.00	26,699.02	46.60

Account Number		2016 July	2016 Actual 07/31/2016	2016 Budget	Budget Status	% of Budget
100-00-53000-620-110	Recycling Salaries & Wages	0.00	0.00	0.00	0.00	0.00
100-00-53000-620-111	FICA Tax - Recycling	0.00	0.00	0.00	0.00	0.00
100-00-53000-620-133	Crew Yard Site Salaries	0.00	0.00	894.00	894.00	0.00
100-00-53000-620-134	Crew Yard Site FICA	0.00	0.00	69.00	69.00	0.00
100-00-53000-938-000	Public Works Insurance	0.00	17,423.37	21,495.00	4,071.63	81.06
100-00-53000-940-000	Forestry	0.00	75.00	0.00	-75.00	0.00
Public Works		92,898.23	582,778.33	1,257,058.00	674,279.67	46.36
100-00-53000-620-315	Recycling Expenses	6,957.24	44,187.47	86,811.00	42,623.53	50.90
100-00-53000-620-320	Solid Waste Collecton Expenses	17,271.35	95,652.91	200,375.00	104,722.09	47.74
Garbage & Recycling Collection		24,228.59	139,840.38	287,186.00	147,345.62	48.69
Total Expenses		117,126.82	722,618.71	1,544,244.00	821,625.29	46.79
Net Totals		-115,853.08	-362,667.29	-1,182,925.00	-820,257.71	30.66

Account Number		2016 July	2016 Actual 07/31/2016	2016 Budget	Budget Status	% of Budget
601-00-40800-100-000	Fire Protection Taxes	0.00	0.00	0.00	0.00	0.00
601-00-40800-200-000	Water Tax Roll	0.00	0.00	0.00	0.00	0.00
601-00-40800-300-000	Sewer Tax Roll	0.00	0.00	0.00	0.00	0.00
601-00-41900-000-000	Interest & Dividend Income	271.79	2,717.48	4,600.00	-1,882.52	59.08
601-00-41900-096-000	1996 Assessment Interest	0.00	0.00	4,600.00	-4,600.00	0.00
601-00-42100-000-000	Misc Non-Operating Income	1,873.71	4,159.16	4,000.00	159.16	103.98
601-00-46100-461-000	Metered Sales - Residential	38,602.44	239,720.86	410,000.00	-170,279.14	58.47
601-00-46100-461-200	Metered Sales - Commercial	5,308.25	18,524.64	20,000.00	-1,475.36	92.62
601-00-46100-461-300	Metered Sales - Industrial	0.00	6,493.12	9,500.00	-3,006.88	68.35
601-00-46100-463-000	Public Fire Protection	8,912.41	62,496.11	110,000.00	-47,503.89	56.81
601-00-46100-463-030	Industrial Fire Protection	0.00	402.00	700.00	-298.00	57.43
601-00-46100-463-200	Commercial Fire Protection	116.00	920.00	1,650.00	-730.00	55.76
601-00-46100-463-300	Metered Sales - Fire Protect	924.00	6,988.80	10,500.00	-3,511.20	66.56
601-00-46100-464-000	Metered Sales/Public Authority	23.38	404.80	1,400.00	-995.20	28.91
601-00-46100-465-000	Metered Sales - Multifam Resid	4,840.31	27,917.46	35,000.00	-7,082.54	79.76
601-00-46100-470-000	Forfeited Discounts	0.00	2,260.00	4,000.00	-1,740.00	56.50
601-00-46100-472-000	Cell Tower Rent on Water Tower	0.00	28,000.00	28,600.00	-600.00	97.90
601-00-46400-421-000	Contributed Assets	0.00	0.00	0.00	0.00	0.00
Water Utility Revenue		60,872.29	401,004.43	644,550.00	-243,545.57	62.21
Total Revenues		60,872.29	401,004.43	644,550.00	-243,545.57	62.21

Account Number		2016 July	2016 Actual 07/31/2016	2016 Budget	Budget Status	% of Budget
601-00-53600-403-000	Depreciation Expense - Water	15,500.00	108,500.00	185,000.00	76,500.00	58.65
601-00-53600-408-000	Taxes-Property Tax Equivalent	0.00	0.00	176,000.00	176,000.00	0.00
601-00-53600-620-000	PUMPING EXPENSE	0.00	0.00	0.00	0.00	0.00
601-00-53600-620-001	PW Director Wages-Water	292.08	2,159.14	3,798.00	1,638.86	56.85
601-00-53600-620-002	PW Director FICA-Water	22.34	165.24	291.00	125.76	56.78
601-00-53600-620-003	PW Crew Salaries Water	0.00	0.00	3,475.00	3,475.00	0.00
601-00-53600-620-004	PW Crew FICA Water	0.00	0.00	266.00	266.00	0.00
601-00-53600-620-007	OIC Pumping	2,690.25	13,926.00	32,104.00	18,178.00	43.38
601-00-53600-622-001	Riser Wausau Energy	0.00	9.84	100.00	90.16	9.84
601-00-53600-622-002	WPS Electric	0.00	10,296.77	24,000.00	13,703.23	42.90
601-00-53600-622-003	WPS Gas	0.00	1,213.27	3,000.00	1,786.73	40.44
601-00-53600-623-001	Operation Supplies & Expense	39.99	296.61	2,000.00	1,703.39	14.83
601-00-53600-623-002	Telephone Exp-Wellhouse	78.96	382.72	900.00	517.28	42.52
601-00-53600-625-001	Maintenance of Pumping Plant	0.00	1,871.00	4,000.00	2,129.00	46.78
601-00-53600-630-000	WATER TREATMENT EXPENSE	0.00	0.00	0.00	0.00	0.00
601-00-53600-630-010	Marathon Co Health Lab	0.00	678.00	900.00	222.00	75.33
601-00-53600-630-011	OIC Treatment	395.63	2,373.78	16,808.00	14,434.22	14.12
601-00-53600-631-001	Chemicals	2,471.15	5,216.74	8,000.00	2,783.26	65.21
601-00-53600-632-001	Operation Supplies & Expenses	156.05	648.54	1,000.00	351.46	64.85
601-00-53600-640-000	TRANSMISSION & DISTRIBUTION EX	0.00	0.00	0.00	0.00	0.00
601-00-53600-640-001	PW Director Dist Wages	292.08	2,159.14	3,798.00	1,638.86	56.85
601-00-53600-640-002	PW Director Dist FICA	22.34	165.24	291.00	125.76	56.78
601-00-53600-640-203	Land Purchase	0.00	30.00	0.00	-30.00	0.00
601-00-53600-641-001	Operation Supplies & Expense	52.24	2,754.16	8,000.00	5,245.84	34.43
601-00-53600-641-002	Water Sampling Expense	60.00	300.00	1,400.00	1,100.00	21.43
601-00-53600-641-003	Capital Outlay Equipment	0.00	0.00	3,000.00	3,000.00	0.00
601-00-53600-650-001	Maint of Distribution Reserv	0.00	0.00	1,000.00	1,000.00	0.00
601-00-53600-650-002	Water Storage	158.25	949.50	1,785.00	835.50	53.19
601-00-53600-651-001	Maintenance of Mains	0.00	2,152.67	1,000.00	-1,152.67	215.27
601-00-53600-651-002	PW Crew Salaries Maintenance	0.00	232.96	3,475.00	3,242.04	6.70
601-00-53600-651-003	PW Crew FICA Maintenance	0.00	0.00	266.00	266.00	0.00
601-00-53600-651-004	OIC Mains	3,085.86	18,515.16	32,004.00	13,488.84	57.85
601-00-53600-652-001	Maintenance of Services	0.00	1,186.08	528.00	-658.08	224.64
601-00-53600-652-002	OIC Service Laterals	474.75	2,848.50	5,350.00	2,501.50	53.24
601-00-53600-653-001	Maintenance of Meters	0.00	2,660.38	5,000.00	2,339.62	53.21
601-00-53600-654-001	Maintenance of Hydrants	0.00	747.20	2,000.00	1,252.80	37.36
601-00-53600-655-001	Maintenance of Other Plants	2,235.00	33,502.30	35,000.00	1,497.70	95.72
601-00-53600-900-000	CUSTOMER ACCOUNTS EXPENSE	0.00	0.00	0.00	0.00	0.00
601-00-53600-901-005	OIC Meter Reading	1,677.45	10,064.70	18,905.00	8,840.30	53.24
601-00-53600-902-001	Utility Clerk Wages Billing	261.31	2,041.52	3,758.00	1,716.48	54.32
601-00-53600-902-002	Utility Clerk FICA Billing	19.04	148.96	288.00	139.04	51.72
601-00-53600-903-001	Billing Supplies	56.50	295.78	600.00	304.22	49.30
601-00-53600-903-002	Postage Expense	0.00	1,842.60	4,000.00	2,157.40	46.07
601-00-53600-903-003	Bank Fees	12.50	87.50	150.00	62.50	58.33
601-00-53600-903-004	Computer Software & Support	0.00	0.00	835.00	835.00	0.00
601-00-53600-904-001	Uncollectable Expense	0.00	0.00	0.00	0.00	0.00
601-00-53600-906-001	PW Director Wages Information	292.08	2,159.14	3,798.00	1,638.86	56.85
601-00-53600-906-002	PW Director FICA Information	22.34	165.24	291.00	125.76	56.78
601-00-53600-906-003	Utility Clerk Wage Information	261.31	2,041.52	3,758.00	1,716.48	54.32
601-00-53600-906-004	Utility Clerk FICA Information	19.04	148.96	288.00	139.04	51.72
601-00-53600-906-007	Consumer Confidence Report	0.00	962.18	1,000.00	37.82	96.22
601-00-53600-906-008	Pipeline Newsletter	0.00	0.00	250.00	250.00	0.00

Account Number		2016 July	2016 Actual 07/31/2016	2016 Budget	Budget Status	% of Budget
601-00-53600-920-000	ADMIN & GENERAL EXPENSE	0.00	0.00	0.00	0.00	0.00
601-00-53600-920-001	Utility Clerk Wages Billing AG	261.31	2,041.52	3,758.00	1,716.48	54.32
601-00-53600-920-002	Utility Clerk FICA Billing AG	19.04	148.96	288.00	139.04	51.72
601-00-53600-920-005	PW Director Wages Billing AG	2,353.10	17,573.29	30,801.00	13,227.71	57.05
601-00-53600-920-006	PW Director FICA Billing AG	166.16	1,274.46	2,360.00	1,085.54	54.00
601-00-53600-921-001	Office Supply Expense	0.00	153.46	500.00	346.54	30.69
601-00-53600-921-003	Office Phone Expense	33.47	223.90	500.00	276.10	44.78
601-00-53600-921-004	Copy Expense	0.00	0.00	500.00	500.00	0.00
601-00-53600-921-005	Internet Access	43.90	309.52	575.00	265.48	53.83
601-00-53600-921-007	Mileage - Water Utility	0.00	16.74	300.00	283.26	5.58
601-00-53600-923-001	Accounting Services	0.00	4,450.00	4,150.00	-300.00	107.23
601-00-53600-923-002	Engineering Services	0.00	2,509.82	32,500.00	29,990.18	7.72
601-00-53600-923-004	Legal Services	0.00	0.00	1,000.00	1,000.00	0.00
601-00-53600-923-005	Diggers Hotline	0.00	220.60	1,500.00	1,279.40	14.71
601-00-53600-923-006	Operator in Charge	553.88	3,323.28	10,006.00	6,682.72	33.21
601-00-53600-923-007	Inspection Services	0.00	0.00	0.00	0.00	0.00
601-00-53600-924-001	Insurance Expense	394.45	3,540.94	4,214.00	673.06	84.03
601-00-53600-926-001	PW Crew Health Operation	244.48	1,734.66	4,009.00	2,274.34	43.27
601-00-53600-926-002	PW Crew Retirement Operation	0.00	0.00	695.00	695.00	0.00
601-00-53600-926-003	Utility Clerk Health Operation	435.41	3,072.83	4,498.00	1,425.17	68.32
601-00-53600-926-004	Utility Clerk Retire Operation	68.96	539.12	993.00	453.88	54.29
601-00-53600-926-005	Utility Clerk EAP Operation	0.00	6.24	14.00	7.76	44.57
601-00-53600-926-007	PW Director Health Operation	760.40	3,606.97	5,681.00	2,074.03	63.49
601-00-53600-926-008	PW Director Retire Operation	136.06	1,017.52	3,039.00	2,021.48	33.48
601-00-53600-928-001	Regulatory Commission Exp	0.00	125.00	0.00	-125.00	0.00
601-00-53600-930-001	PW Crew Wages Misc	0.00	0.00	3,580.00	3,580.00	0.00
601-00-53600-930-002	PW Crew FICA Misc	0.00	0.00	274.00	274.00	0.00
601-00-53600-930-003	Utility Clerk Wages Misc	261.31	2,042.24	3,758.00	1,715.76	54.34
601-00-53600-930-004	Utility Clerk FICA Misc	19.04	149.01	287.00	137.99	51.92
601-00-53600-930-005	PW Director Wages Misc	292.08	2,159.14	3,798.00	1,638.86	56.85
601-00-53600-930-006	PW Director FICA Misc	22.34	165.24	289.00	123.76	57.18
601-00-53600-930-009	Education/Seminars Expense	0.00	51.97	300.00	248.03	17.32
601-00-53600-930-010	Marathon Co Health Wells	0.00	0.00	2,500.00	2,500.00	0.00
601-00-53600-930-011	OIC Garden Wells	0.00	216.00	6,750.00	6,534.00	3.20
601-00-53600-930-013	Recruiting Expense	0.00	0.00	0.00	0.00	0.00
601-00-58000-001-221	Bond Issuance Costs	0.00	0.00	0.00	0.00	0.00
601-00-58000-001-429	Amortization Exp - 1996 Issue	0.00	0.00	0.00	0.00	0.00
601-00-58000-002-427	Inter 7.375/6.135/2.3M 15.95%	0.00	12,111.62	11,743.00	-368.62	103.14
601-00-58000-002-428	Prin $7.375/6.135/2.3M 15.95%	0.00	218,240.00	218,240.00	0.00	100.00
601-00-59000-300-000	Transfer to Debt Service	0.00	0.00	0.00	0.00	0.00
Water Utility Expenses		36,713.93	516,923.09	966,860.00	449,936.91	53.46
Total Expenses		36,713.93	516,923.09	966,860.00	449,936.91	53.46
Net Totals		24,158.36	-115,918.66	-322,310.00	-206,391.34	35.96

Account Number		2016 July	2016 Actual 07/31/2016	2016 Budget	Budget Status	% of Budget
650-00-40800-300-000	Sewer Tax Roll	0.00	0.00	0.00	0.00	0.00
650-00-46200-622-001	Metered Sales-Residential	38,764.41	248,777.49	400,000.00	-151,222.51	62.19
650-00-46200-622-002	Metered Sales-Commercial	3,433.93	20,161.08	30,000.00	-9,838.92	67.20
650-00-46200-622-003	Metered Sales-Industrial	21.85	8,790.31	45,000.00	-36,209.69	19.53
650-00-46200-622-005	Metered Sales - Multifam Res	6,370.29	42,971.04	55,000.00	-12,028.96	78.13
650-00-46200-623-000	Metered Sales-Public Auth	28.63	829.16	1,400.00	-570.84	59.23
650-00-46200-631-000	Forfeited Discount	461.08	2,823.22	6,000.00	-3,176.78	47.05
650-00-46200-635-000	Other Sewerage Revenue	3,000.00	23,425.00	10,000.00	13,425.00	234.25
650-00-46400-421-000	Contributed Assets	0.00	0.00	0.00	0.00	0.00
650-00-48000-001-100	Interest & Dividend Income	237.95	1,617.45	3,300.00	-1,682.55	49.01
650-00-48000-001-196	Special Assessment Interest	0.00	0.00	8,000.00	-8,000.00	0.00
Sewer Utility Revenue		52,318.14	349,394.75	558,700.00	-209,305.25	62.54
Total Revenues		52,318.14	349,394.75	558,700.00	-209,305.25	62.54

Account Number		2016 July	2016 Actual 07/31/2016	2016 Budget	Budget Status	% of Budget
650-00-53560-850-001	PW Crew Salaries & Wages	0.00	0.00	10,530.00	10,530.00	0.00
650-00-53560-850-002	PW Crew FICA	0.00	0.00	806.00	806.00	0.00
650-00-53560-850-004	PW Crew Insurance	244.48	1,734.66	4,009.00	2,274.34	43.27
650-00-53560-850-005	PW Crew Retirement	0.00	0.00	695.00	695.00	0.00
650-00-53560-850-006	Utilities Clerk Salaries/Wages	1,045.42	8,167.37	15,029.00	6,861.63	54.34
650-00-53560-850-007	Utilities Clerk FICA	76.19	596.01	1,151.00	554.99	51.78
650-00-53560-850-008	Utilities Clerk Health Ins	435.41	3,072.83	4,498.00	1,425.17	68.32
650-00-53560-850-009	Utilities Clerk Retirement	69.01	538.92	993.00	454.08	54.27
650-00-53560-850-010	Utilities Clerk EAP Fringe	0.00	6.26	14.00	7.74	44.71
650-00-53560-850-011	PW Director Salaries & Wages	3,521.48	26,209.97	45,989.00	19,779.03	56.99
650-00-53560-850-012	PW Director FICA	255.54	1,935.13	3,522.00	1,586.87	54.94
650-00-53560-850-013	PW Director Health Insurance	760.42	3,607.07	5,681.00	2,073.93	63.49
650-00-53560-850-014	PW Director Retirement	136.06	1,017.52	3,039.00	2,021.48	33.48
650-00-53650-403-000	Depreciation Expense-Sewer	16,575.00	116,025.00	199,570.00	83,545.00	58.14
650-00-53650-821-001	Wisconsin Public Service-Elec	0.00	9,061.24	20,000.00	10,938.76	45.31
650-00-53650-821-002	Wisconsin Public Service-Gas	0.00	128.49	500.00	371.51	25.70
650-00-53650-826-000	Capital Outlay Equipment	0.00	0.00	1,000.00	1,000.00	0.00
650-00-53650-827-001	Operation-Telephone Exp	404.25	2,918.63	5,000.00	2,081.37	58.37
650-00-53650-827-002	System Membership/Service Cont	0.00	0.00	250.00	250.00	0.00
650-00-53650-831-000	Mainten of Collecting System	1,835.70	11,473.76	27,243.00	15,769.24	42.12
650-00-53650-832-000	Maintenance of Stations	2,920.65	21,664.98	89,123.00	67,458.02	24.31
650-00-53650-851-001	Office Supplies Expense	18.77	247.22	600.00	352.78	41.20
650-00-53650-851-002	Postage Expense	0.00	1,842.58	3,000.00	1,157.42	61.42
650-00-53650-851-003	Office-Phone Expense	33.47	223.90	550.00	326.10	40.71
650-00-53650-851-004	Copy Expense	0.00	0.00	400.00	400.00	0.00
650-00-53650-851-005	Billing Supplies	56.50	295.77	600.00	304.23	49.30
650-00-53650-851-006	Internet Access	43.90	309.55	500.00	190.45	61.91
650-00-53650-852-001	Accounting Services	0.00	3,350.00	5,000.00	1,650.00	67.00
650-00-53650-852-002	Engineering Services	0.00	0.00	16,000.00	16,000.00	0.00
650-00-53650-852-003	Legal Services	0.00	0.00	1,000.00	1,000.00	0.00
650-00-53650-852-004	Rib Mt Sewerage District	11,234.83	71,692.48	170,000.00	98,307.52	42.17
650-00-53650-852-005	Diggers Hotline	0.00	0.00	1,500.00	1,500.00	0.00
650-00-53650-852-006	Operator in Charge	553.88	3,323.28	10,006.00	6,682.72	33.21
650-00-53650-852-008	Pipeline Newsletter	0.00	253.00	500.00	247.00	50.60
650-00-53650-852-010	Meter Reading Share	1,677.45	10,064.70	18,905.00	8,840.30	53.24
650-00-53650-853-000	Insurance Expense	0.00	1,146.81	1,548.00	401.19	74.08
650-00-53650-856-000	Misc General Expense	0.00	360.11	7,250.00	6,889.89	4.97
650-00-53650-856-001	Education/Seminars Expense	0.00	51.98	300.00	248.02	17.33
650-00-53650-856-002	Mileage - Sewer Utility	0.00	16.74	200.00	183.26	8.37
650-00-53650-856-013	Recruiting Expense	0.00	0.00	0.00	0.00	0.00
650-00-53650-857-001	Capital Improvements	0.00	0.00	1,000.00	1,000.00	0.00
650-00-59000-100-000	Transfer to General Fund	0.00	0.00	0.00	0.00	0.00
650-00-59000-300-000	Transfer to Debt Service	0.00	0.00	203,307.00	203,307.00	0.00
Sewer Utility Expenses		41,898.41	301,335.96	880,808.00	579,472.04	34.21
Total Expenses		41,898.41	301,335.96	880,808.00	579,472.04	34.21
Net Totals		10,419.73	48,058.79	-322,108.00	-370,166.79	-14.92