

October 9, 2020

NOTICE

The undersigned, Harriet E. Rosenthal, Mayor of the Village of Deerfield, pursuant to the provisions of Section 2-24 of the Municipal Code of the Village of Deerfield and 5 ILCS 120/2.2, does hereby call and give notice that the Mayor and Board of Trustees will meet as a committee of the whole at 1:00 p.m. on Tuesday, October 13, 2020 via remote Zoom meeting.

Please click the link below to join the webinar:

<https://deerfieldil.zoom.us/j/87551681668?pwd=NFhwQ3JVS3cweHhzOHNoTmJXcHlaZz09>

Passcode: G^?0syBJ

Or phone:

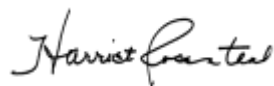
US: +1 312 626 6799 or +1 301 715 8592

Webinar ID: 875 5168 1668

Passcode: 73227317

An agenda for the committee of the whole is attached to this notice.

The village clerk is hereby directed to: (1) forthwith deliver a copy of this notice to all village trustees; (2) post a copy of this notice of said special meeting not less than 48 hours prior to said special meeting at the village hall; and (3) supply copies of this notice to any news media which has filed an annual request for such notices.



HARRIET ROSENTHAL, Mayor

Committee of the Whole Meeting
October 13, 2020
Via remote Zoom meeting
1:00 p.m.

Please click the link below to join the webinar:

<https://deerfieldil.zoom.us/j/87551681668?pwd=NFhwQ3JVS3cweHhzOHNoTmJXcHlaZz09>

Passcode: G^?0syBJ

Or phone:

US: +1 312 626 6799 or +1 301 715 8592

Webinar ID: 875 5168 1668

Passcode: 73227317

1. Call to Order
2. Roll Call
3. Public Comment

Village residents wishing to respectfully share thoughts about any matter concerning the Village may do so by submitting an email to publiccomment@deerfield.il.us prior to the meeting. Emails received will be read aloud during Public Comment. Any e-mails received during the meeting will be read during the second public comment before the end of the meeting. We ask that you keep your emailed response to under 200 words to allow time for others to be heard and for the Board to progress through the public meeting agenda. In addition, members of the public may provide oral comments by telephone or web-based video conference during the time designated for public comment or during the consideration of items on the agenda provided that such comments do not exceed three minutes in duration. The Board typically does not immediately respond to public comments or engage in open dialogue, but we are of course actively listening to your comments.

At least one representative from the Village will be present at Village Hall and the virtual meeting will be simulcast at Village Hall for members of the public who do not wish to view the virtual meeting from another location. Pursuant to Restore Illinois Phase 4, the opportunity to view the virtual meeting at Village Hall is available on a “first come, first-served” basis due to limited capacity.

4. 2021 Budget
 - a. Water Meter Infrastructure Schedule
5. Closed Session,
Pursuant to 5 ILCS 120/2(c)21; (c)1 and (c)2
6. Presentation by WRF Process Investigation (Odor) Study Consultant
7. Presentation by Storm Water Consultant
8. Public Comment
9. Adjournment



Memorandum

Public Works & Engineering Department

To: Kent Street, Village Manager

From: Robert Phillips, P.E., Director of Public Works and Engineering

Date: October 8, 2020

Subject: Water Meter Replacement
Vehicle and Equipment Replacement Fund Contribution
Village Board Update

Background:

Since 2001, the Public Works Department has installed Automatic Meter Reading (AMR) heads, along with brass body water meters. The AMR heads send out a radio frequency that is currently collected by a meter reader driving throughout the Village with a laptop that gathers the information as the vehicle passes by. The brass body water meters, made by Badger Meter, have a recommended life cycle of 30 years and the majority of our brass meters are 10-15 years old. AMR heads have a battery life expectancy of 10-15 years, and as the batteries have deteriorated the Water Division has worked to replace them on an as needed basis. Therefore, a growing number of meter heads, going back to 2001, are nearing the end of their battery life and are in need of replacement while the meter bodies should continue to serve the Village for another 15 years. Therefore, the next round of meter infrastructure replacement will begin in 2036 and will include meter bodies and meter heads for all residential and commercial accounts.

Earlier this year, staff began the preparation for the future replacement of all residential and commercial water meter heads within the Village. The goal is to replace all residential and commercial meter heads over a four year period. The proposal is to start this endeavor in the northwest quadrant in 2021, which has the highest number of meter heads that have been in service for 15 years or more. In 2019 staff implemented new meter reading and billing software. The new software will allow residents to check water usage on a more regular basis. Depending upon the meter heads selected, cellular vs. radio telemetry, customers will be able to access real-time usage information or information that is updated several times per day.



Meter with Cellular Head

Cost:

The Village currently manages over 6,000 commercial and residential meters. The present cost to replace the meter heads, material only, is approximately \$1,654,250. This amount has been planned for as part of the 5 year CIP that is currently under consideration. The brass meter bodies for the residential and commercial accounts have a present estimated value of \$1,138,008. All combined, the AMR meter heads, and meter bodies have a total present value of \$2,840,258. This cost will likely increase over the next 15 years, and for the benefit of this exercise staff has projected a steady 3% rate of increase. Therefore, the estimated future value of all metering infrastructure in 15 years is \$4,425,030.

Residential Meters Present & Future Value			
Meter Size	# of Units	Present Value Meter & Head	2036 Value Meter & Head
5/8" Meter	2,872	\$ 875,960	\$ 1,364,717
3/4" Meter	2,133	\$ 724,153	\$ 1,128,208
1" Meter	1,321	\$ 574,635	\$ 895,263
1.5" Meter	76	\$ 61,940	\$ 96,501
2" Meter	23	\$ 35,926	\$ 55,972
Totals		\$ 2,272,614	\$ 3,540,659

Average Residential Quarterly Contribution = \$9.18

Residential Meters 2036 Yearly VERF						
Meter Size	Units	2036 Price	Yearly Price	Quarterly Price	Yearly VERF	
5/8" Meter	2,872	\$ 475.18	\$ 31.68	\$ 7.92	\$ 90,981.14	
3/4" Meter	2,133	\$ 528.93	\$ 35.26	\$ 8.82	\$ 75,213.84	
1" Meter	1,321	\$ 677.72	\$ 45.18	\$ 11.30	\$ 59,684.17	
1.5" Meter	76	\$ 1,269.74	\$ 84.65	\$ 21.16	\$ 6,433.37	
2" Meter	23	\$ 2,433.55	\$ 162.24	\$ 40.56	\$ 3,731.44	
Total Annual VERF					\$ 236,043.96	

Commercial Meters Present and Future Value			
Meter Size	# of Units	Present Value Meter & Head	2036 Value Meter & Head
2" Meter	105	\$ 249,375	\$ 388,518
3" Meter	48	\$ 134,304	\$ 209,241
4" Meter	29	\$ 124,265	\$ 193,601
6" Meter	10	\$ 59,700	\$ 93,011
Totals	192	\$ 567,644	\$ 884,371

<i>Commercial Quarterly Contribution</i>	
<i>2" Meter</i>	<i>\$61.67</i>
<i>3" Meter</i>	<i>\$72.65</i>
<i>4" Meter</i>	<i>\$111.26</i>
<i>6" Meter</i>	<i>\$155.02</i>

Commercial Meters 15 Year VERF					
Meter Size	Units	2036 Price	Yearly Price	Quarterly Price	Yearly VERF
2" Meter	105	\$ 3,700.17	\$ 246.68	\$ 61.67	\$ 25,901.21
3" Meter	48	\$ 4,359.19	\$ 290.61	\$ 72.65	\$ 13,949.42
4" Meter	29	\$ 6,675.89	\$ 445.06	\$ 111.26	\$ 12,906.72
6" Meter	10	\$ 9,301.07	\$ 620.07	\$ 155.02	\$ 6,200.71
				Total Annual VERF	\$ 58,958.06

VERF:

Since the 1980’s, the Village of Deerfield has maintained a Vehicle and Equipment Replacement Fund (VERF). The fund works as a savings account that is used to save for large expenses related to vehicle and equipment replacement. The Village has been successful in planning for future purchases by budgeting annually for contributions to this account. The philosophy is that each piece of equipment is assigned a current value and a replacement value, the replacement value is typically estimated with annual compounded escalator of 3%. The replacement value is divided by the life cycle of the piece of equipment, and that amount is the annual budget contribution. For example, a truck with an estimated replacement value of \$150,000 will have an annual VERF contribution of \$15,000. Metering infrastructure can be budgeted for within the VERF account. This could take the form of annual contributions for all, or part, of the aforementioned metering infrastructure. The spreadsheets above show one example of VERF contributions for metering infrastructure. As mentioned above, the annual escalator is a compounded 3% which is consistent with our current and past practice in VERF accounting.

Conclusion:

The Village is planning to replace all residential and commercial meter heads during the 2021-2024 fiscal years. The estimated cost to perform the replacement of meter heads, for material only, is \$1,654,250. Starting in 2036 the Village will need to replace the AMR meter heads as well as the brass meter bodies for all residential and commercial accounts, a future cost of \$4,425,030.

The Village may choose to consider adding water metering infrastructure to the VERF. The annual cost to do so is estimated to be \$36.72 per year for each residential account and a graduated scale, ranging from \$61.67 to \$155.02, per quarter for each commercial account



Memorandum

Public Works & Engineering Department

To: Kent Street, Village Manager

From: Robert Phillips, P.E., Director of Public Works and Engineering

Date: October 8, 2020

Subject: Water Reclamation Facility Process Investigation Study
Village Board Update

The Village of Deerfield Wastewater Reclamation Facility (WRF), and associated staff, is responsible for the treatment of wastewater from the entire 5.5 square mile area within the Village, as well as small portions of the Village of Bannockburn and the City of Highland Park. The WRF is designed to fully process 3.25 million gallons of raw wastewater per day (MGD), with a maximum capacity to fully process 8.5MGD, and can pump up to 30MGD during wet weather. The facility was fully reconstruction in 2013 and the satellite pumping stations that serve our collection system have been re-built, or have had replacement of major components, within the last 12 years.

The WRF breaks raw wastewater down into three basic products (clean effluent water, grit, and bio-solids) through a series of processes that include, but are not limited to; screening, aeration, flocculation and settling, and drying. Due to the nature of the incoming product, each of the aforementioned processes has the ability to create odor. In addition, other events such as heavy rain, sludge hauling, or equipment failure can produce odor on occasion. Staff typically receives 5-6 odor complaint events per calendar year, all of which have been documented through emails and Citizen Service Requests. We have held regular meetings with neighboring properties in an attempt to reduce odors, some of which have resulted in modifications to our standard operating procedures.

The Village Board authorized staff to move forward with a process investigation study (odor study) in early 2020. Staff selected a nationally recognized wastewater engineering firm, Donohue & Associates, to provide technical services that include, but are not limited to; measuring odors emitted from the Village of Deerfield WRF, evaluate the processes used to treat wastewater at WRF, identify possible modifications to the standard operations of the plant that can help to reduce odors, and provide recommendations that the Village can choose to implement over time to reduce odor.

The Consultant began their study in April of this year and has had an opportunity to meet with neighbors, collect the necessary odor data, review the current operation and evaluate processes, has modeled existing and proposed conditions, and has prepared a summary of possible improvements with estimated capital costs. Donohue & Associates will be presenting their findings, in a draft format, at the October 13, 2020, Committee of the Whole meeting.

Executive Summary
Process Investigation & Odor Mitigation Report
Village of Deerfield Water Reclamation Facility



Date: October 7, 2020
To: Village of Deerfield: Robert Phillips, Brandon Janes
From: Donohue & Associates: Mike Harvey, Bill Marten, Natalie Cook
Webster Environmental Associates: Bruce Koetter

Purpose & Plan

The Village of Deerfield owns and operates the Deerfield Water Reclamation Facility (WRF). The Village has been receiving odor complaints from neighbors of the WRF and initiated this Investigation to evaluate options to reduce odors. The purpose of this project is to identify and rank the sources of the odor at the facility and to evaluate options to mitigate that odor. In order to meet these objectives, the Village retained the team of Donohue and Associates and Webster Environmental Associates to: identify possible odor sources; test those sources to quantify and prioritize them; develop odor dispersion models; develop odor control alternatives; evaluate and model those alternatives; and recommend an odor control plan.

Odor Testing Results

Thirteen potential odor sources were identified, sampled and tested for odor detection threshold (D/T). Odor emission rates were calculated, and the sources were prioritized. Detailed testing results and calculated odor emission rates are available in the full report. A summary of current conditions is shown in Table 1.

Table 1 Odor Emission Rate Rankings (Current Normal Conditions)

Location	Odor Emission Rate (D/T x cfm)	Percentage of Total
Aerobic Digesters (All 3 Digesters in Service)	891,000	40.03%
IPS Screen Room Roof Exhauster	644,600	28.96%
Excess Flow Storage Pond	410,925	18.46%
Aeration Tanks (Both Tanks in Service)	340,000	15.28%
Final Clarifiers (All 4 in Service)	292,200	13.13%
Dewatering Room Exhauster	240,000	10.78%
IPS Dumpster Room Roof Exhauster	228,800	10.28%
Biosolids Processing Building (Undisturbed Biosolids)	69,300	3.11%
Centrifuge Vent	5,250	0.24%
	2,225,825	100%

Four odor sources were identified as the having the highest odor emission rates:

1. Biosolids Process Building
2. Aerobic Digesters (after decanting and air is turned back on – not shown in Table 1)
3. Excess Flow Basin
4. Influent Pump Station (IPS) Screen and Dumpster Room

Control alternatives were developed for the first three of these sources. Air exhausted from the IPS Screen and Dumpster Room is unlikely to be detected off-site because the odor D/T for these areas was quite low and providing air treatment would have little to no benefit.

Alternatives Analysis

Odor control alternatives were developed and evaluated. The alternatives are described in detail in the full report and summarized here.

Alternative 1: Rolling Rain Curtains

This alternative includes the installation of rolling rain curtains around the perimeter of the biosolids storage building to keep blowing rain off the biosolids and to mitigate the impact of wind blowing across the biosolids and picking up odor.

Alternative 2: Aerobic Digester Odor Control

Most of the odor emissions from the aerobic digesters happen when the blowers are turned back on after being off for several hours to allow for decanting. Operators routinely turn off the aeration to the digesters to decant digester liquor in order to have sufficient capacity to maintain proper solids retention time in the tanks. Two alternatives were evaluated for the digesters.

Alternative 2A: Mechanical Thickening

One option is to mechanically thicken the waste activated sludge (WAS) to a higher solids concentration prior to digestion. This eliminates the need for decanting altogether.

Alternative 2B: Cover & Treat

The second alternative is to cover the aerobic digesters and capture and treat the air being off gassed in a carbon adsorber.

Alternative 3: Excess Flow Basin

Diluted wastewater enters this basin after rain events when incoming flows to the plant exceed the design treatment capacity. After influent flows return to normal, the stored wastewater is pumped from the basin back to the head of the plant. Odors sometimes result when the wastewater has to be stored for an extended period of time, particularly during the basin draining process. Two alternatives were investigated to mitigate this potential odor source.

Alternative 3A: Sodium Hypochlorite

Addition of sodium hypochlorite (or other strong oxidizing chemical) upstream of the excess flow basins would prevent water from becoming septic and mitigate the formation of odorous compounds.

Alternative 3B: Chemically Enhanced Primary Treatment (CEPT)

Through addition of flocculent and coagulant to the excess flow clarifiers, more solids could be removed from the clarifiers prior to reaching the excess flow basins, thus reducing the solids load to the basin.

Cost

A summary of the estimated costs associated with each alternative is shown in Table 2. All alternatives have an up-front construction cost, alternatives 1, 2A, and 2B have annual operations and maintenance costs, and alternatives 3A and 3B have per-storm flow event chemical costs. 20 year present worth accounts for current and future costs – see full report for assumptions and calculations.

Table 2 Summary of Cost Opinions

	Biosolids Processing Building	Aerobic Digesters		Excess Flow Basin	
	1 – Rolling Rain Curtains	2A – Mechanical WAS Thickening	2B – Cover & Treat Digesters	3A – Sodium Hypochlorite	3B – CEPT
Construction Cost	\$ 38,000	\$1,013,000	\$2,239,000	\$133,000	\$133,000
Annual O&M	\$ 953	\$ 60,259	\$ 2,150		-
Cost per Event	-	-	-	\$ 100	\$ 141
20 Year Present Worth	\$ 47,000	\$1,519,000	\$2,282,000	\$153,000	\$161,000

Recommendation

Donohue recommends that the odor mitigation plan is enacted in three phases:

Phase 1: Initial Implementation

Implementation of Alternative 1, and piloting and implementation of Alternative 3B.

Phase 2: Impact Monitoring

Monitor impacts of Phase 1 and continue with Phase 3 only if odor has not decreased sufficiently.

Phase 3: Secondary Implementation (Optional)

Implementation of Alternative 2A. This alternative is recommended to be included along with future upgrades anticipated to meet upcoming permit changes.



Memorandum

Public Works & Engineering Department

To: Kent Street, Village Manager

From: Robert Phillips, P.E., Director of Public Works and Engineering

Date: October 8, 2020

Subject: Storm Water Master Plan
Village Board Update

Over the last several years, the Village has performed evaluations of the water distribution and sanitary sewer collection systems on a Village wide scale. Obtaining a big picture evaluation has helped in determining the overall performance of each utility, and has assisted in determining priority projects for future years. Similarly, during budget discussions in 2019 the Engineering Department was given direction to move forward with a storm sewer system master plan in 2020.

Like many other communities in the area, the Village faces difficulties in providing adequate storm sewer collection and conveyance. The majority of the Village storm sewer collection system was designed and installed 50-70 years ago under different and more antiquated design requirements than we have today. Since that time, the Illinois State Water Survey has updated storm water detention and design criteria with respect to changing weather patterns several times. The Village has historically reacted to the updated criteria, thereby moving forward with new development and capital projects in a way that meets the new demand. Conducting a Village wide storm water master plan will help the Village better identify the cause and severity of flooding issues and allow for the proactive planning and improvement in such areas.

The scope of the master plan includes, but is not limited to, studying and analyzing the existing storm sewer system, building and confirming a hydrologic / hydraulic model, determining flood reduction projects, the preparation of a Village wide drainage study report, and exploring the possible validity of a future storm water utility fee. Due to the overall complexity and size of the project, it is anticipated that the final report will not be completed until mid-2021.

The Village contracted with Christopher B. Burke Engineering, Ltd. (CBBEL) in late 2019 and the storm water study began in March of 2020. CBBEL installed flow meters prior to spring rains in an attempt to collect the necessary data to build the hydrologic/hydraulic model that will be used as a tool to study and prioritize flooding concerns. The study is well underway and the consultant is in a position to give a formal update regarding the project at the October 13, 2020 Committee of the Whole meeting.



October 8, 2020

DEERFIELD STORMWATER MASTER PLAN - EXECUTIVE SUMMARY UPDATE

Due to localized surface flooding in numerous locations during moderate to heavy rainfall events, the Village of Deerfield (Village) initiated the development of a Village-wide Stormwater Master Plan (SMP) to identify and develop proposed flood reduction projects and policies to address drainage problems within the Village. A SMP identifies the existing drainage problems by quantifying the depth of ponding and provides stormwater solutions to mitigate this flooding. The methodology for analyzing the storm sewer system for the SMP includes a comprehensive review of the existing storm sewer system, on-site resident meetings, hydrologic and hydraulic modeling of the existing drainage system, and identification of system limitations.

The Village has two main watercourses generally flowing from north to south: the West Fork of the North Branch Chicago River (WFNB) and the Middle Fork of the North Branch Chicago River (MFNB). CBBEL has divided the Village into two study areas: the West Study Area and the East Study Area. The West Study Area includes all area tributary to the WFNB, which generally consists of the west side of the Village and a small portion of area east of the railroad by Village Hall and adjacent to the viaduct on Deerfield Road. The East Study Area includes all area in the Village that is tributary to the Middle Fork of the North Branch Chicago River. While all the stormwater runoff in the Village drains to one of these watercourses, the intent of the study is to mitigate localized flooding within the Village. Therefore, overbank flooding associated with the rivers is not part of this SMP.

Public input is a significant component of the development of the SMP. Due to the ongoing pandemic, a public open house was not able to be held. However, flood questionnaires and resident feedback were solicited during the months of June through August. We received 159 flood questionnaires and performed 44 one-on-one meetings with residents and neighborhood meetings, in addition to several independent site visits and spoke with numerous residents via phone. The public input has provided us numerous pictures, videos and reported high water marks from recent storm events. In addition to the public outreach, we have been collecting data, including flow monitoring, and completed an existing conditions hydrologic and hydraulic analysis of the storm sewer system. Part of the data collection has been surveys of the sizes and depths of selected storm sewers. The flow monitoring consists of gages at 6 locations throughout the Village with sensors in the storm sewers that continuously relay the information to a website.

CBBEL developed a hydrologic and hydraulic model that simulates the existing drainage system. This model was calibrated to the May 13-17 and May 23, 2020 storm events using the data gathered from the flow monitors in addition to the information received from residents. The model was further verified using multiple other storms that have occurred since the flow monitors have been

in place (February 2020). This baseline model was then used to identify and quantify flood prone areas for various storm events to determine the prioritization of improvement areas.

Our next step, which is underway, includes the development of concept plans that will reduce/mitigate flooding in the areas identified by Village staff. Each of these plans will be analyzed using the baseline model to verify the flood reduction benefits associated with each project. Based on discussions with Village staff, the prioritization areas include:

1. Existing structure flooding that has not been mitigated by other projects or cannot be mitigated by the resident;
2. Street flooding where the water elevation exceeds the crown of the road during a 10-year design storm event;
3. Rear yard depressional areas that do not have an existing outlet and affect multiple residences.

A conceptual engineer's estimate of probable cost for each of the proposed drainage improvement alternatives will be prepared. These will consist of both short-term and long-term capital improvements projects that will range in cost and benefit. Proposed projects may consist of various stormwater improvements including above-ground stormwater storage, below-ground stormwater storage, increased storm sewer sizes, new storm sewers, and overland flow routes. Based on discussions with the Village, the recommended proposed improvements will be prioritized based on the type of flood mitigation it provides, cost, and number of impacted residents or roadways.

Finally, numerous reports of flooding on private property throughout the residential portions of the Village were received through the data collection process. There were approximately 140 reported instances of yard flooding on private property. Many of these are due to the topography in the Village and timeframe when areas were developed without a stormwater ordinance. This has led to low-lying areas and drainageways with shallow slopes with standing water after storm events. One option for the Village to consider is the possibility of providing design assistance to residents that wish to implement drainage improvements on their property because they collect runoff from several other properties they do not control. Some of the problems are due to re-grading of lots or newer homes that have exacerbated the issue for older homes. Re-grading of lots occurs over the years and unintended consequences of blocking an overland flow route can be the result.

CBBEL anticipates having the proposed conditions analysis completed by the end of November and will present these proposed projects to the Village staff. Each project will include both a concept plan and cost estimate. Upon review from the Village staff, CBBEL will present these improvements to the Village Board and to the public. A final plan, including the prioritization matrix and recommendations for a potential rear yard drainage program will be finalized in early 2021.