


MEMORANDUM

Date: October 5, 2012
To: Chairman Hughes and the Finance Commission
From: Darrell J. Langlois, Assistant Village Manager/Finance Director 
RE: Water Meters and Meter Reading System Replacement

Attached to this memorandum is a presentation regarding the status of Village water meters and a discussion as to a number of alternative approaches to address aged water meters and the possibility of upgrading the technology used to read water meters.

At the conclusion of the presentation I make mention of the fact that there number of different phased approaches that could be considered in addressing the meter and meter reading problems. To facilitate discussion of cost at the meeting, I have also prepared a cost/benefit analysis of three different approaches that could be considered in addressing this issue. For purposes of the presentation, I intentionally made the exhibits conservative to not overstate the proposed cost/benefits. Any number of these assumptions may be changed if so directed by the Commission.

I look forward to reviewing the presentation with the Finance Commission at its meeting on October 11, 2012.

**Village of Hinsdale
Meter and Meter Reading System Alternatives
Cash Flow Comparison**

	<u>Comprehensive/Bonding</u>		<u>Phased-Meters Only</u>		<u>Phased-Meters and Reading</u>	
	<u>Savings/ (Cost)</u>	<u>Cumulative</u>	<u>Savings/ (Cost)</u>	<u>Cumulative</u>	<u>Savings/ (Cost)</u>	<u>Cumulative</u>
FY 2014	734,333	734,333	(41,929)	(41,929)	(224,786)	(224,786)
FY 2015	(425,333)	309,000	70,571	28,642	(10,286)	(235,072)
FY 2016	375,000	684,000	145,571	174,213	66,714	(168,358)
FY 2017	375,000	1,059,000	220,571	394,784	143,714	(24,644)
FY 2018	375,000	1,434,000	295,571	690,355	220,714	196,070
FY 2019	375,000	1,809,000	370,571	1,060,926	297,714	493,784
FY 2020	375,000	2,184,000	408,071	1,468,997	337,214	830,998
FY 2021	375,000	2,559,000	536,000	2,004,997	600,000	1,430,998
FY 2022	375,000	2,934,000	536,000	2,540,997	600,000	2,030,998
FY 2023	375,000	3,309,000	536,000	3,076,997	600,000	2,630,998
FY 2024	375,000	3,684,000	536,000	3,612,997	600,000	3,230,998
Total At Completion of Bond Issue	3,684,000		3,612,997		3,230,998	
FY 2024	600,000	4,284,000	536,000	4,148,997	600,000	3,830,998
FY 2025	600,000	4,884,000	536,000	4,684,997	600,000	4,430,998
FY 2026	600,000	5,484,000	536,000	5,220,997	600,000	5,030,998
FY 2027	600,000	6,084,000	536,000	5,756,997	600,000	5,630,998
Total 15 Year Projection	6,084,000		5,756,997		5,630,998	

Village of Hinsdale
Meter and Meter Reading System Alternatives
Present Value of Cash Flow Alternatives

FY	PV Factor	Comprehensive Nominal	Comprehensive PV	Phased Meters Only Nominal	Phased Meters Only PV	Phased w/Reading Nominal	Phased w/Reading PV
2014	1	734,333	734,333	(41,929)	(41,929)	(224,786)	(224,786)
2015	1.05	(425,333)	(405,079)	70,571	67,210	(10,286)	(9,796)
2016	1.1025	375,000	340,136	145,571	132,037	66,714	60,512
2017	1.157625	375,000	323,939	220,571	190,538	143,714	124,146
2018	1.215506	375,000	308,513	295,571	243,167	220,714	181,582
2019	1.276282	375,000	293,822	370,571	290,352	297,714	233,267
2020	1.340096	375,000	279,831	408,071	304,509	337,214	251,634
2021	1.4071	375,000	266,505	536,000	380,925	600,000	426,409
2022	1.477455	375,000	253,815	536,000	362,786	600,000	406,104
2023	1.551328	375,000	241,728	536,000	345,510	600,000	386,765
2024	1.628895	375,000	230,217	536,000	329,058	600,000	368,348
Totals		3,684,000	2,867,762	3,612,997	2,604,163	3,230,998	2,204,184

Assumptions

1. Annual costs and revenues of alternatives per analysis
2. PV Discount factor = 5%
3. Assumes zero inflation in revenues and costs

Village of Hinsdale
Meter and Meter Reading System Replacement
Estimated Project Budget-Comprehensive Project

	Units	Per Unit	Amount	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total
Estimated Meters to be Replaced Number	3,800	\$150.00	570,000	380,000	190,000										570,000
Meter Contingency (if more meters, larger meters, etc.)			30,000	20,000	10,000										30,000
Radio Reading Devices	5,800	\$100.00	580,000	386,667	193,333										580,000
Meter Reading Infrastructure (server, data collectors, etc)			100,000	100,000											100,000
Installation and Project Management	5,800	\$ 90.00	522,000	348,000	174,000										522,000
Temporary Part Time Employee for 18 months			45,000	30,000	15,000										45,000
Programming Allowance to Integrate Reading Software with Billing Software			20,000	20,000											20,000
Project Contingency			33,000	22,000	11,000										33,000
Total Estimated Project Cost			<u>1,900,000</u>	<u>1,306,667</u>	<u>593,333</u>										<u>1,900,000</u>
Bond Proceeds*				1,855,000											1,855,000
Target Revenue Enhancement (8% of \$7.5 million phased in 1/3-1/3-1/3)				200,000	400,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	6,000,000
Meter Reading Costs				(14,000)	(7,000)										(21,000)
Debt Service					(225,000)	(225,000)	(225,000)	(225,000)	(225,000)	(225,000)	(225,000)	(225,000)	(225,000)	(225,000)	(2,250,000)
Cost/Benefit				734,333	(425,333)	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	3,684,000
Cumulative				<u>734,333</u>	<u>309,000</u>	<u>684,000</u>	<u>1,059,000</u>	<u>1,434,000</u>	<u>1,809,000</u>	<u>2,184,000</u>	<u>2,559,000</u>	<u>2,934,000</u>	<u>3,309,000</u>	<u>3,684,000</u>	<u>3,684,000</u>

*Would not bond for staffing costs

Village of Hinsdale
Meter (Only) System Replacement
Estimated Project Budget and Cash Flow Projection

	Units	Per Unit	Amount	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total
Estimated Meters to be Replaced Number (7 years)	3,800	\$150.00	570,000	81,429	81,429	81,429	81,429	81,429	81,429	81,429					570,000
Meter Contingency (if more meters, larger meters, etc.)			30,000	4,286	4,286	4,286	4,286	4,286	4,286	4,286					30,000
Upgrade PT Employee to Full Time w/benefits				50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	550,000
Project Contingency (7 years)			33,000	4,714	4,714	4,714	4,714	4,714	4,714	4,714					33,000
Total Estimated Project Cost			<u>633,000</u>	<u>140,429</u>	<u>140,429</u>	<u>140,429</u>	<u>140,429</u>	<u>140,429</u>	<u>140,429</u>	<u>140,429</u>	<u>50,000</u>	<u>50,000</u>	<u>50,000</u>	<u>50,000</u>	<u>1,183,000</u>
Target Revenue Enhancement (8% of \$7.5 million phased in 1.5% 2 yrs, 1% 4 yrs, 0.5% 2 years)				112,500	225,000	300,000	375,000	450,000	525,000	562,500	600,000	600,000	600,000	600,000	4,950,000
Meter Reading Costs				(14,000)	(14,000)	(14,000)	(14,000)	(14,000)	(14,000)	(14,000)	(14,000)	(14,000)	(14,000)	(14,000)	(154,000)
Cost/Benefit				(41,929)	70,571	145,571	220,571	295,571	370,571	408,071	536,000	536,000	536,000	536,000	3,613,000
Cumulative				<u>(41,929)</u>	<u>28,643</u>	<u>174,214</u>	<u>394,786</u>	<u>690,357</u>	<u>1,060,929</u>	<u>1,469,000</u>	<u>2,005,000</u>	<u>2,541,000</u>	<u>3,077,000</u>	<u>3,613,000</u>	<u>3,613,000</u>

Village of Hinsdale
Meter and Meter Read System Replacement
Estimated Project Budget and Cash Flow Projection

	Units	Per Unit	Amount	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total
Estimated Meters to be Replaced Number (7 years)	3,800	\$150.00	570,000	81,429	81,429	81,429	81,429	81,429	81,429	81,429					570,000
Meter Contingency (if more meters, larger meters, etc.)			30,000	4,286	4,286	4,286	4,286	4,286	4,286	4,286					30,000
Radio Reading Devices	5,800	\$100.00	580,000	82,857	82,857	82,857	82,857	82,857	82,857	82,857					580,000
Meter Reading Infrastructure (server, data collectors, etc)			100,000	100,000											100,000
Upgrade PT Employee to Full Time w/benefits until 2021				50,000	50,000	50,000	50,000	50,000	50,000	50,000					350,000
Project Contingency (7 years)			33,000	4,714	4,714	4,714	4,714	4,714	4,714	4,714					33,000
Total Estimated Project Cost			<u>1,313,000</u>	<u>323,286</u>	<u>223,286</u>	<u>223,286</u>	<u>223,286</u>	<u>223,286</u>	<u>223,286</u>	<u>223,286</u>	-	-	-	-	<u>1,663,000</u>
Target Revenue Enhancement (8% of \$7.5 million phased in 1.5% 2 yrs, 1% 4 yrs, 0.5% 2 years)				112,500	225,000	300,000	375,000	450,000	525,000	562,500	600,000	600,000	600,000	600,000	4,950,000
Meter Reading Costs				(14,000)	(12,000)	(10,000)	(8,000)	(6,000)	(4,000)	(2,000)					(56,000)
Cost/Benefit				(224,786)	(10,286)	66,714	143,714	220,714	297,714	337,214	600,000	600,000	600,000	600,000	3,231,000
Cumulative				(224,786)	(235,071)	(168,357)	(24,643)	196,071	493,786	831,000	1,431,000	2,031,000	2,631,000	3,231,000	<u>3,231,000</u>

**Village of Hinsdale
Water Meters and Meter Reading
System Replacement
October, 2012**

Background Information

Water and Sewer Fund

- An Enterprise Fund of the Village that is used to account for the revenues and expenses of operating the water and sewer utility.
- User fees of the system should pay for the full cost operating the utility.
- Is accounted for very differently than governmental funds in that under generally accepted accounting principles the fund is required to follow full accrual accounting, including recognition of depreciation expense.

Village of Hinsdale
Water and Sewer Operations Fund
Comparative Income Statement (Cash Basis)

	FY 2010-11 Actual	FY 2011-12 Actual	FY 2012-13 Budget
Operating Revenues			
Water Sales	5,576,549	5,731,370	6,800,000
Sewer Sales	586,009	597,237	660,000
Miscellaneous	54,431	38,242	43,855
Total Operating Revenues	6,216,989	6,366,849	7,503,855
Operating Expenses			
DWC Supply Costs	2,100,680	2,216,323	2,960,000
Other Expenses	2,507,089	2,581,821	3,048,489
Total Operating Expenses	4,607,769	4,798,144	6,008,489
Operating Income	1,609,220	1,568,705	1,495,366
Debt Service	496,061	450,564	493,655
Amount Available for Capital	1,113,159	1,118,141	1,001,711

Commentary on Operating Results

- For FY 2013, water supply costs from DWC are estimated to be 43.5% of water revenues and 49% of total operating expenses.
- The current water rate is designed to generate \$1.5 million annually for Water and Sewer capital improvements as called for in the Infrastructure Master Plan.
- In FY 2011 and FY 2012 this was not achieved due to below budget water consumption due mostly to weather
- In the FY 2013 Budget, this was not projected to be met due to lower usage expectations and \$355,000 of departmental capital (unusually high, partially due to increased meter replacement cost).
- It is likely that the full transfer of \$1.5 million will be made this year due over budget revenues from the hot summer.

Water and Sewer Customers

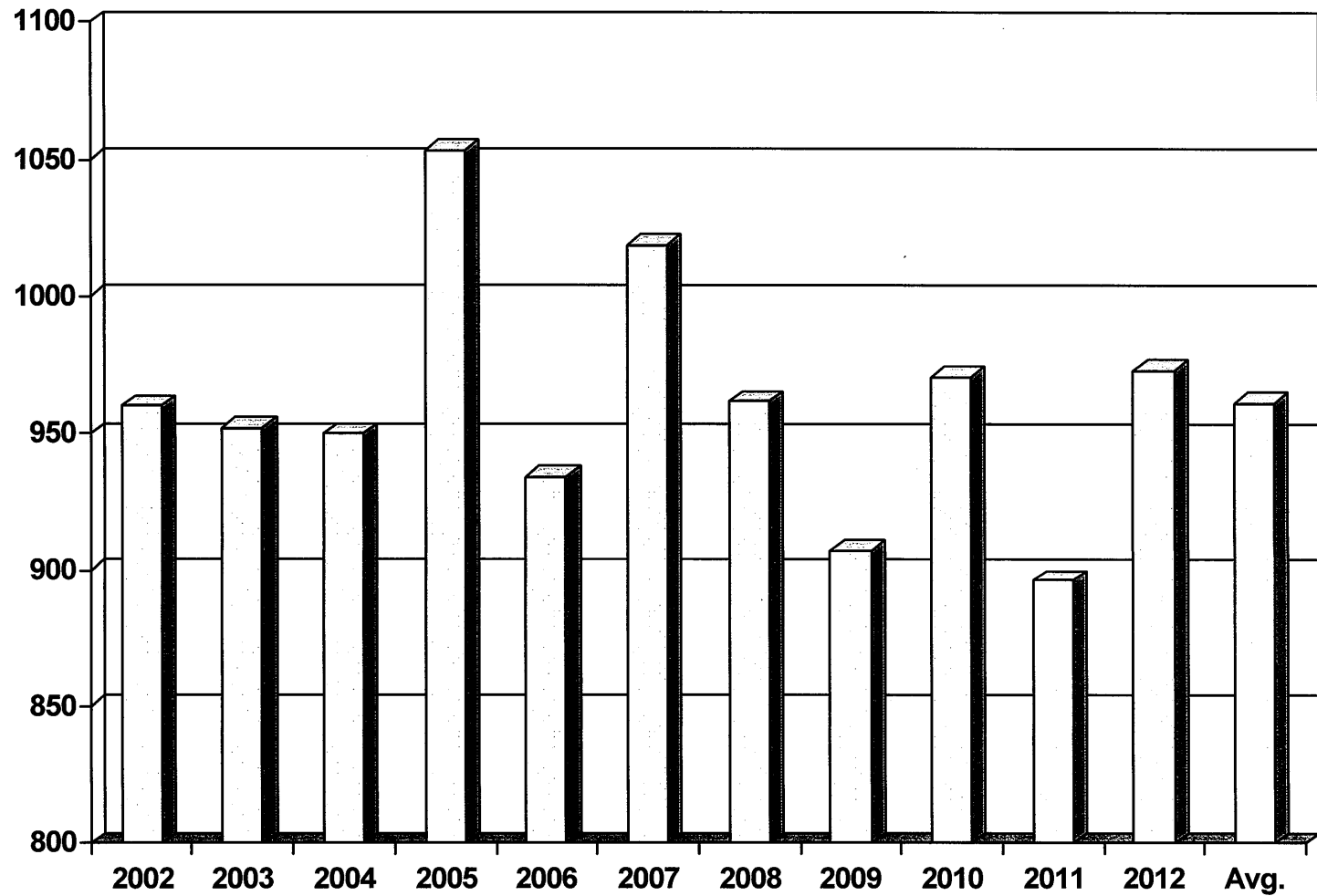
- There are currently 5,836 total water billing customers
- Approximately 75% of water customers also receive sewer collection services from the Village-the remainder are serviced by Flagg Creek Water Reclamation District or MWRD.
- Most Village water customers also receive a bill from Flagg Creek for sewer treatment services that is also based on water consumption.
- Approximately 400 water users are from unincorporated areas outside of the Village of which approximately 300 of these users are in Golfview Hills.

Water and Sewer Billing

- All customers are billed bi-monthly
- The current consumption rate for water is \$6.599 per 100 cubic feet; the sewer charge (where applicable) is assessed at 15% of the water charge.
- All customers are subject to a minimum bi-monthly bill of \$22.00 (\$25.30 including sewer) that includes the first 300 cubic feet of water. This is in lieu of a fixed service charge that is imposed by many other Villages.
- The water rate has been increased annually from \$3.982 per 100 cubic feet in 2008 to \$6.599 currently, an increase of 65.7%.
- The primary cause of the increases was to fund a \$1.5 million annual contribution for system improvements and to pass along significant increases in the cost of water from DWC.
- Due mainly to cost increases from the City of Chicago, the DWC rates are expected to increase an additional 20% in 2013, 18% in 2014, and 17% in 2015; this will ultimately result in approximately \$1.7 million of additional costs annually and will require subsequent rate increases totaling approximately 25% in order to pass along these increased costs.

Historical Water Purchases

(Calendar year data in 1,000,000 gallons)



Historical Water Purchases

- Can vary significantly year to year depending on weather.
- Based on customer feedback it is likely that some of the decline experienced during 2011 is attributed to customer conservation measures resulting from the accumulation of the large rate increases; will likely continue to have an impact in the future.
- The large variances in consumption can have a dramatic impact on meeting the funding requirements of the Infrastructure Master Plan.
- With minimal operating reserves in the Water Fund there is no way to “smooth” these variances in a particular year; over time it is hoped that these variances will even out.

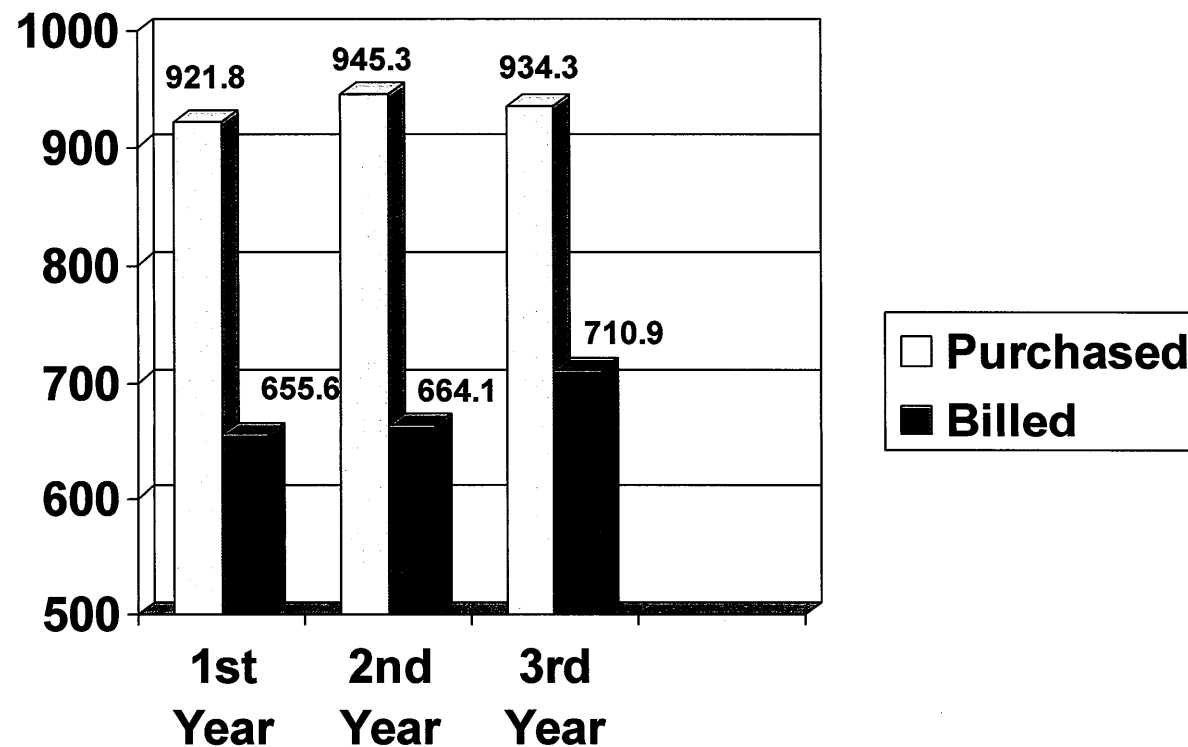
Unaccounted for Water

Unaccounted for Water

- Defined as the difference between the volume of water purchased from the Du Page Water Commission as compared to the volume of water billed by the Village.
- These amounts will never be the same due to unavoidable leakage in system piping, water main breaks, municipal use, hydrant flushing, etc.
- Considering the age of the system and comparable results from other villages, a realistic target would be that the Village bill 85% to 90% of the volume of water purchased.
- As a user of Lake Michigan water, the Illinois Department of Natural Resources (IDNR) requires that the Village maintains an acceptable level of accounted for water (approximately 85% or greater) or we are required to implement measures to improve in this area.

Water Purchased vs. Billed

(Last 36 months of data compiled into 12 month increments; data in 1,000,000 gallons)



Water Purchased vs. Billed

- For presentation purposes, it is assumed that there is a two month lag from the time water is purchased until it is billed (there is no perfect way to match up the data).
- The period reflected consists of water purchased from July, 2009 to June, 2012 as compared to water billed from September, 2009 to August, 2012.
- Broken down into 12 month segments, the Village's accounted for water is estimated follows:

-1 st Year	71.1%
-2 nd Year	70.3%
-3 rd Year (most recent)	76.1%
- Since the billed data includes consumption attributed to minimum billing (we bill for the consumption although in many cases it is not actually used), the actual accounted for water percentages would be somewhat less than reflected in the results.
- These results are below the target level of 85% to 90% experienced in many other Village and is below an acceptable level as determined by IDNR (below 85% is a problem).

Typical Causes of Unaccounted for Water

- As previously mentioned, some of the cause is due unavoidable leakage in system piping, water main breaks, municipal use, hydrant flushing, etc.
- Undetected water main leaks in the system (the Village has a leak detection survey done annually by an outside contractor to mitigate this potential problem area).
- Malfunctioning water meters.

Water Meters

Water Meters

- The Village's water meter stock consists of meters from a number of different manufacturers as well as a number of different sizes (and costs) depending on the expected water demand of the service.
- The recommended useful life of a water meter is 15 to 20 years, although outside verification of this standard is scarce.
- As water meters age there tends to be wear and tear on the mechanical components as well as the accumulation of particles that may build up in the meter chamber. Due to these factors it is common that meters slow down over time, and that has obvious impacts on billing and revenue.
- In a number of cases the meters slow down and eventually stop moving. This results in customers receiving only a minimum bill even though their water use may be substantial.
- This is a significant problem here in Hinsdale as we have been pursuing several hundred of these accounts over the last year, and work in this area is likely responsible for the increase of 5% in the accounted for water estimate mentioned in a previous slide.

Age of Water Meters

- It is estimated that the Village last replaced most of its water meters approximately 25 years ago.
- A number of meters have been replaced over the last 10 or 15 years as a result of the large number of “tear downs” in the Village.
- Although our utility billing system does contain meter installation data, we found it to be incomplete and inaccurate.
- There are paper records of each meter installation in the Water Department. To estimate the age of the water meters, we initially randomly sampled 480 water meter installation cards and found that 61% of meters were over 15 years old and that 51% were older than 20 years old.
- Not satisfied with these results, we randomly sampled an additional 483 water meter installation cards and found that 78% of meters were over 15 years old and 70% are more than 20 years old.
- Since January, 2007 the Village has replaced approximately 700 water meters; of those replaced, approximately 525 were installed after January 2011 due to our pursuing slow and stopped water meters. This process is not complete and is ongoing.

Impact of Water Meters on Unaccounted for Water

- Based on discussions with Water Department personnel, they have indicated the water main infrastructure is relatively “tight” (considering the age of the system) and not a major cause of unaccounted for water, beyond a reasonable allowance for unavoidable leakage.
- This can be backed up by personnel reviewing system pumped data, and that undetected water main leaks will generally eventually surface. This fact is also confirmed by an annual leak detection survey.
- These facts, and considering the estimated age of the meter stock, leads us to believe that old and possibly malfunctioning water meters are likely the major contributor to the problem of unaccounted for water.

Residential Water Meter Testing

- To further test the theory that malfunctioning water meters are a cause of the water billing problem, we changed out a number of water meters that appeared to be functioning properly but were over 20 years old.
- The old meters were tested for accuracy by ME Simpson, a Village contractor. In order to pass the test, the meters were required to generally read in the accuracy range of 97% to 103% (an AWWA standard) and were also tested at different flow rates.
- The first test of 20 meters resulted in 10 meters failing; of those meters failing the average accuracy rate was 90.4%.
- The second test of 17 meters resulted in 8 meters failing; of those meters failing the average accuracy rate was 81.7%.
- The third test of 14 meters resulted in 1 meter failing; the accuracy rate for that meter was 82%.

Conclusions on Water Meters

- All of the data and testing we have done indicates that the age of the water meters is a definite problem and requires some systematic approach to replacement.
- Sampling would seem to indicate that 60% to 70% of our meters need replacement. Using 65% as a midpoint would result in the need to replace at least 3800 meters.
- Meter costs vary according to meter size. Using an estimated average cost of \$150 would result in a total estimated outlay for meter replacement of \$570,000.
- At current staffing levels it is estimated that we could replace 500 to 600 meters per year. This would likely result in the meter replacement program taking approximately 7 years to complete and would delay material improvements in our unaccounted for water.
- As point of reference, at current rates a 5% improvement in the Village's unaccounted for water would yield at least \$450,000 (950 million gallons purchased converts to approximately 127 million cubic feet; 5% improvement is 6,350,000 cubic feet/100 X \$6.599 current rate is \$419,036-use \$450,000 as estimate as most would be subject to 15% sewer charge).
- Consideration may be given to hiring a contractor to rapidly speed up this process to generate the positive results sooner.

Water Meter Reading

Water Meter Reading

- At the present time meters are read using a touchpad meter reading system.
- This is done by a meter reader attaching a device to a touchpad unit on the outside of the home, which then receives the meter reading and stores the reading in a hand held device.
- Readings are uploaded at Village Hall at which time they are processed, edited, and used for billing.
- Meter readings are also provided to Flaag Creek Sanitary District (at no cost) for their billing purposes.

Meter Reading Technology

- The current touchpad meter reading system technology is 20 to 25 years old and was likely implemented when Hinsdale last replaced water meters.
- For the last ten or so years, the touch pad technology is being phased out in many municipalities in favor radio reading technologies (drive-by and fixed position data collectors primarily).
- Village staff surveyed 19 Du Page area communities, which indicated that of the 13 communities that responded to our survey 11 are using radio reading technology to read some or all of its water meters.
- As the Village approaches water meter replacement, this calls into question whether we should install 25 year old meter reading technology on new water meter installations that are expected to last another 20 years.

Advantages to Current Meter Reading System

- Staff is familiar with its operation.
- Low cost to maintain software.
- The Village enjoys a very favorable cost arrangement from an individual who is an independent contractor that reads our meters. Meters are manually read at a cost of less than \$0.50 per read or about \$14,000 annually.

Disadvantages to Current Meter Reading System

- The Village is completely reliant on one individual to read meters.
- The current financial arrangement will likely not be repeated once this individual stops reading meters.
- Water Department staff are still required to manually read 60 to 80 meters per month due to missed reads, dogs, fences, etc.
- It is undetermined how long we will be able to have the software maintained for the next 20 years, and will the various equipment items (touchpad devices, handheld readers, docking stations, etc.) continue to be available that far into the future.
- The reading process is very slow-it is not uncommon for many meter readings to take 50 days or more to bill. This provides very poor customer service in leak situations in that a high bill is frequently the indicator of a leak, and many are not detected until well into a second billing period due to this time lag.
- Water Department staff is required to perform all customer service reading work involving re-reading, high bill investigations, and final billing readings. This can easily equate to 150 readings per month.
- Technological improvements in the area of high bill investigation, leak detection (by more frequent reads and reading at smaller increments than 100 cubic feet) would not be realized.

Water Billing Responsibilities

Water Billing Responsibilities

- Coordinate meter reading process (download reading file, upload reads, revise reading file for errors, schedule re-reads and missed reads)
- Process approximately 2,900 bills monthly
- Review billing data to identify slow or stopped meters, high readings, schedule meter maintenance as required.
- Process all lock box payments, research and correct rejected items.
- Prepare and send out approximately 150 to 200 shut off letters monthly

Water Billing Responsibilities

- Process work orders for customer service requests.
- Respond to all customer inquiries (250-300 per month based on actual call log).
- Process 50-75 final bills per month.
- Review accounts receivable listing in order to send letters and pursue collection action on final billed accounts.
- Monitor the status of payment agreements.
- Process 40 to 60 water meter change outs per month.

Water Billing Challenges

- At current staffing levels (one full time employee and one part time employee two days per week) we are not able to accomplish all of these tasks on a regular basis.
- Due to higher usage from changing meters and higher rates inflating bills we have had a drastic increase in customer calls regarding high water bills (169 calls were received in the first five days after the most recent bills were sent out).
- Due to the volume of calls there is frequent dissatisfaction with customers who are forced to leave several voicemails, call back may not be the same day, etc.
- These calls frequently result in work orders for re-reads and high bill investigation, which need to be monitored and follow up.
- Now that we have indentified meters as a problem the work associated with meter maintenance, scheduling, customer letters (many times multiple letters need to be sent) is new in the last two years.
- We are required to monitor vacant properties and the state of the economy, coupled with higher water bills, has dramatically increased the need for more stringent collection procedures (but this also increases call volume as shut-off letters=telephone calls).

Possible Approaches

- The most pressing problem facing the village is the age of the water meters.
- Using an estimated average cost of \$150 for an estimate of 3800 meters would result in a total estimated outlay for meter replacement of \$570,000.
- The lowest cost option would be to budget an annual outlay of \$75,000 to \$100,000 for a water meter only project, completed in house and accomplished over an estimated seven year period. We would stay status quo on meter reading.
- The most expensive option would be to replace 100% of meters older than 5 years, install radio meter reading devises at all 5800 customer installation, and would hire a contractor to accomplish this project so that it would be completed in 15 to 18 months.
- There are an unlimited number of phased approaches between these two options that could be considered.

Village of Hinsdale
Meter and Meter Reading System Replacement
Estimated Project Budget-Comprehensive Project

	Units	Per Unit	Amount
Estimated Meters to be Replaced Number	3,800	\$ 150.00	\$ 570,000
Meter Contingency (if more meters, larger meters, etc.)			30,000
Radio Reading Devices	5,800	\$ 100.00	580,000
Meter Reading Infrastructure (server, data collectors, etc)			100,000
Installation and Project Management	5,800	\$ 90.00	522,000
Temporary Part Time Employee for 18 months			45,000
Programming Allowance to Integrate Reading Software with Billing Software			20,000
Project Contingency			<u>33,000</u>
Total Estimated Project Cost			<u><u>\$ 1,900,000</u></u>
Cost per bill over 20 year period			<u><u>\$ 2.73</u></u>

Comments on the Comprehensive Approach

- At an estimated cost of \$1.9 million, would require borrowing.
- Over a ten year period would cost approximately \$225,000 per year.
- Hopefully would not have to raise rates to fund if expected improvements in unaccounted for water are realized, though some of it would be used on debt service instead of other uses (water mains?).
- Admittedly the financial benefit could be difficult to measure during the first two or three years due to other unrelated changes in billing and consumption, such as seasonal factors (we could implement this program and water revenues still go down).
- While this option would be the most expensive, would allow the positive results to be accelerated in as fast as 18 months.
- As we would go through an RFP process, hopefully the costs could be somewhat reduced.
- Once completed would have a major positive impact on water billing operations and avoid the need to consider additional personnel in order to accomplish core tasks.