

Wilmette Water Plant 2009 Annual Operating Report



Ray S. Ames Jr.
Water Plant Superintendent
March 15, 2010

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Introduction

The Wilmette Water Plant is a conventional surface water treatment facility that purifies and pumps Lake Michigan water to the 101,000 residents of Wilmette, Glenview and Prospect Heights.

Mission Statement

The management of the Village of Wilmette and the Engineering Department are committed to providing the safest drinking water possible. This has been the Village's goal since the mid 1990's when the first mission statement was developed for the water plant:

"The Water Plant of the Village of Wilmette is committed to providing our customers with safe palatable drinking water at adequate pressures and quantities that meets all state and federal water regulations."

Staffing

The plant is staffed by six Operators, three Meter Shop employees, one Chemist, a part-time Secretary, an Assistant Superintendent and a Superintendent. All Operators and Managers are required to have the highest Illinois water supply Operator's License, Class *A*. There are five full time employees to perform maintenance work at the water plant: a Mechanic, an Electrician, an Instrument Maintainer, a Building Maintainer and a Maintenance Worker. As much as possible, employees are cross-trained to insure uninterrupted service to our customers. The Village also maintains an Illinois Public Health Department Certified Laboratory for bacteriology.

History

The water plant, constructed in 1933, was originally designed to treat and pump 6 million gallons per day (MGD) for its Wilmette customers. In the 1950's, the Village began retail water sales to Glenview and the Glenview Naval Air Station (GNAS). To meet the increased demand of these additional customers, a major expansion of the plant was undertaken in 1956 to bring the capacity up to 15 MGD. A second expansion in 1971 brought the capacity up to 27 MGD.

Since 1988, the following major additions to the water system have been completed:

- Constructed a 3 MG reservoir/pumping station on the west side of Wilmette and a new 36-inch East-West transmission main between the water plant and the new reservoir to help the water system meet peak-hour demands on hot summer days. (1988-1989)
- Installed a Supervisory Control and Data Acquisition (SCADA) control system at the water plant to improve plant reliability and allow the Operators to better monitor and control operations. (1994)
- Constructed the 1997 Bond Issue Improvements. These improvements included a new variable speed low lift pump, a 1,000 kW emergency natural gas generator and the rehabilitation of the three 1956 filters at the water plant, including the installation of an air scour system. (1997)
- Completed the 8-MGD Improvements at the water plant. These improvements, valued at \$ 6.3 M, added 8-MGD to the capacity of the system, bringing the total up to the current rated capacity, 44-MGD. Ninety one percent of the construction costs for this project were funded by the Village of Glenview. (2004)
- Completed a major rehabilitation of the three 1971 filters. Contract work included extension of air scour system to the 1971 filters and replacement of the underdrain systems and filter media. The resulting improvements enhanced the filter backwash process and improved filtered water quality. (2007)

2009 Activities

Some highlights of major activities in 2009 are listed below:

- Installed an additional 885 Automatic Meter Reading units (AMRs), bringing the installed total up to 7,658. The remaining 1,400 units should be installed by 2011 (see page 11-12);
- Replaced the washwater troughs for filters 1-4 at the water plant (see page 11-12);
- Completed construction of the emergency generator at the storm water pumping station. These improvements will power the station pumps in the event of a complete loss of ComEd power (see page 11);

In 2009 the Village again saw improvements in finished water quality, with the tap turbidity dropping from 0.06 NTUs (2008) to 0.05 NTUs (2009). The reasons for this improvement include better monitoring control, the switch to DelPAC 2020 coagulant in November 2008 and the air scour improvements to the 1971 filters made in 2007.

Also in 2009, water sales continued to decline, to the lowest level since 1992. Water sales are sensitive to weather, and 2009 had a cool, wet summer like 2008. Also, changes in the plumbing code in the early 1990's requiring low flow plumbing fixtures for all new construction and low flow appliances currently on the market have certainly had an effect. Neighboring communities have seen a similar decline in water sales recently.



Memberships

The Village is a Water Research Foundation charter member, an annual contributor to the Partnership for Safe Water and pays the dues for all Operators to belong to the American Water Works Association (AWWA). The Village is also a member of the West Shore Water Producers Association (WSWPA), a professional group made up of utilities on the west shore of Lake Michigan from Wisconsin, Illinois and Indiana. Plant employees are encouraged to attend WSWPA meetings, IEPA and AWWA classes for water treatment operations and maintenance training.

Recent Awards

The Village received the Director's Award from the Partnership for Safe Water for the second consecutive year. The Partnership is a voluntary effort between six drinking water organizations and more than 400 surface water utilities throughout the US to provide a higher level of treatment by optimizing treatment plant performance. There are only about 200 treatment plants in the country -- and only eight in Illinois -- that have achieved this level of performance. Congratulations to the staff at the water plant for this achievement!

Ray S. Ames Jr., Water Plant Superintendent
March 15, 2010

Wilmette Water Plant 2009 Plant Operations Summary Data

Location	Year	2009		2008		2007	
Low Lift Pumpage	Avg. Day	11.149	MGD	11.419	MGD	12.112	MGD
	Peak Day	18.975	8/14/09	18.712	9/1/08	22.746	8/2/07
	Peak Hour	22.332	8/14/09	22.872	9/1/08	24.300	8/3/07
High Lift Pumpage	Avg. Day	11.244	MGD	11.531	MGD	12.207	MGD
	Peak Day	19.325	8/14/09	18.946	9/1/08	22.545	8/2/07
	Peak Hour	22.524	8/14/09	24.756	8/20/08	24.420	8/3/07
Distribution of Purified Water	Wilmette Avg. Day	3.160	MGD	3.249	MGD	3.410	MGD
	Wilmette Peak Day	5.419	8/15/09	6.382	9/1/08	6.169	7/8/07
	Glenview Avg. Day	8.075	MGD	8.247	MGD	8.728	MGD
	Glenview Peak Day	13.546	8/14/09	13.033	9/2/08	16.673	8/2/07
	3.0 MG Reservoir	0.630	MGD	0.684	MGD	0.757	MGD
Plant Use	Service Water	0.027	MGD	0.042	MGD	0.071	MGD
	Backwash Water	0.098	MGD	0.134	MGD	0.175	MGD
	Recycled Water	0.200	MGD	0.187	MGD	0.231	MGD

2009 Plant Operating Cost Summary *

	Cost 2009	\$/MG 2009	\$/MG 2008	\$/MG 2007
Personnel Services	1674087	411.39	\$ 392.17	\$ 352.65
Contractual Services	65917	16.20	24.40	25.39
Power	437984	107.63	96.82	91.30
Chemicals	188032	46.21	27.78	27.37
Natural Gas	42530	10.45	17.45	13.62
Other Commodities	164829	40.50	56.13	44.49
Other Expenses	123994	30.47	28.39	25.42
Capital Outlay	83208	20.45	72.37	4.94
Total Annual Cost	\$ 2,780,581	\$ 683.30	\$ 585.18	\$ 562.54

* Beginning in 1994, operating costs in this report include all Meter Shop related expenses but excludes Distribution expenses. Power includes a \$18,604 credit for participation in ComEd CLR program. Cost Summary excludes the following Major Capital Items charged in 2009: Evanston-Wilmette Interconnection Engineering Svcs (\$97,239), 1933 Filter Troughs (\$119,000), SCADA Software Upgrade (\$28,417) and the SWPS Electrical Improvements (\$734,477). The following capital projects are included in the operating costs: Roof repairs (\$4,300), 1933 Bldg. Tuckpointing (\$9,760), Chemical Feed Improvements (\$4,957), 1933 Filter SW Valve Replacement (\$4,865), Lighting Improvements (\$1,895), Zebra Mussel Control Line Repairs (\$25,930), Vault "A" Hatch Repl. (\$19,040), 1933 Filters Media Replenishment (\$6,492), Glenview Meter Upgrade (\$17,320), On-Line Water Monitoring Instrument (\$2,411) and Data Transmitters (\$3,558).

Wilmette Water Plant 2009 Log of Pumping Operations

Month	Low Lift	High Lift	Glenview	Wilmette	Service	Reservoir		System Pk. Hr.	Wash Pump	Recycle	Energy	
						Pump	Fill				Power	Gas
January	332.257	332.016	224.017	107.590	0.502	18.828	18.735	12.581	3.191	5.363	337200	893000
February	286.687	290.554	198.301	93.511	0.386	15.764	14.120	11.897	2.455	4.276	291600	695700
March	301.991	305.943	217.216	88.561	0.302	13.204	13.068	10.999	2.847	4.585	321000	600700
April	290.127	292.952	213.577	80.614	0.400	15.446	13.807	11.022	2.192	4.756	297200	442300
May	349.523	353.831	255.567	95.502	0.386	19.286	21.662	13.643	2.287	6.473	323600	229500
June	359.305	361.520	264.655	97.381	0.736	18.945	17.693	14.090	3.190	6.406	330400	141900
July	444.551	448.144	325.310	120.317	1.996	18.130	18.651	16.473	3.923	7.340	410000	127500
August	436.724	441.193	322.162	119.571	0.931	21.250	19.779	17.236	4.616	8.300	423200	140100
September	382.554	383.944	277.860	104.277	2.094	17.977	17.690	15.896	3.185	7.462	354400	152800
October	301.203	303.611	219.581	83.873	0.994	20.191	19.354	11.735	2.915	10.161	297400	243900
November	281.028	282.562	205.218	77.711	0.527	24.670	23.776	11.578	2.477	4.309	279200	317400
December	303.297	307.847	223.870	84.482	0.574	26.161	25.082	12.243	2.535	3.698	302400	599800
Total	4069.247	4104.117	2947.334	1153.390	9.828	229.852	223.417	159.394	35.813	73.128	3967600	4584600
Avg. Mo.	339.104	342.010	245.611	96.116	0.819	19.154	18.618	13.283	2.984	6.094	330633	382050
Max. Mo.	444.551	448.144	325.310	120.317	2.094	26.161	25.082	17.236	4.616	10.161	423200	893000
Min. Mo.	281.028	282.562	198.301	77.711	0.302	13.204	13.068	10.999	2.192	3.698	279200	127500
Avg. Day	11.149 MGD	11.244 MGD	8.075 MGD	3.160 MGD	0.027 MGD	0.630 MGD	0.612 MGD	17.236 MGD	0.098 MGD	0.200 MGD	10870 KWH	12561 ft ³

Wilmette Water Plant 2009 Chemical/Filter Operations

	Avg. Run, hrs.	Filters	Avg. LOH	Tap Sample Avg. Day					CL ₂ Res. mg/l	FI Res. mg/l	PO ₄ Res. mg/l	Turb. NTU	Particles Per ml
		Total Washes		DelPAC	Chlorine	Fluoride	Carbon	Phosphate					
January	264	25	4.1	27906	5631	14666	1708	3100	0.97	1.07	0.27	0.05	0.7
February	317	22	4.1	20588	5045	12711	492	2646	0.99	1.08	0.26	0.05	1.0
March	293	22	2.7	28106	5506	13380	0	2743	0.95	1.07	0.25	0.05	0.5
April	249	17	2.6	25364	5443	12876	0	2551	0.96	1.06	0.25	0.05	0.6
May	253	18	5.0	25885	6314	15692	0	3054	0.94	1.07	0.26	0.05	0.3
June	241	25	4.4	27816	7173	16131	0	3225	0.93	1.08	0.26	0.06	1.4
July	259	28	6.0	38350	9405	19871	0	3951	0.94	1.09	0.25	0.07	4.8
August	198	33	6.0	35866	8690	19451	0	4214	0.98	1.08	0.26	0.05	0.7
September	299	25	4.8	30966	7663	16809	0	3699	0.91	1.08	0.30	0.05	1.4
October	302	24	3.1	25260	6368	13165	0	2990	0.96	1.05	0.30	0.06	0.9
November	312	23	3.9	20774	5198	12274	0	2716	0.97	1.06	0.25	0.05	0.7
December	314	25	3.5	25820	5532	13283	0	2955	0.99	1.06	0.29	0.06	0.6
Total	3300	287	4.3	332701	77967	180309	2200	37844	11.49	12.85	3.22	0.63	13.7
Avg. Mo.	275	24	4.2	6352	6497	15026	183	3154	0.96	1.07	0.27	0.05	1.1
Max. Mo.	317	33	6.0	6352	9405	19871	1708	4214	0.99	1.09	0.30	0.07	4.8
Min. Mo.	198	17	2.6	20588	5045	12274	0	2551	0.91	1.05	0.25	0.05	0.3
Avg. Day	275	0.8	4.2	423	214	494	6	104	0.96	1.07	0.27	0.05	1.1
	hrs./run	washes	ft	lbs.	lbs.	lbs.	lbs.	lbs.	mg/l	mg/l	mg/l	NTU	#/ml
Avg. Chem. Dose				81.8	19.2	44.3	0.5	9.3					
				lbs./MG	lbs./MG	lbs./MG	lbs./MG	lbs./MG					

Notes: LOH = loss of head; Cl₂ = chlorine; FI = fluoride; PO₄ = phosphate; mg/l = milligrams per liter; ml = milliliters; MG = million gallons; Res. = Residual; Turb. = Turbidity; NTU = Nephelometric Turbidity Units; switched to DelPAC 2020 coagulant in Nov. 2008; Carbon was fed in January and February 2009 to test feed system.

Treatment

Raw water enters the plant through intake lines out in Lake Michigan. During the summertime, a small dose of chlorine is fed into the intake pipes to help control the growth of zebra mussels. After traveling under the lake bed to the low lift pumping station, the raw water receives a second (pre) chlorine dose in the low lift pump suction well for disinfection. Next, the water is lifted about 15 feet by low lift pumps and delivered to the water plant.

Treatment chemicals – including a coagulant, DelPAC 2020, (for the removal of turbidity, or “cloudiness” in the water), fluoride (for prevention of dental cavities) and powdered activated carbon (for taste and odor removal) – are fed at water plant’s in-line water mixers. This is the **chemical pretreatment** step, before distribution to the mixing-settling basins. Typically, no more than a teaspoonful of chemicals is added to every 100 gallons of water treated.

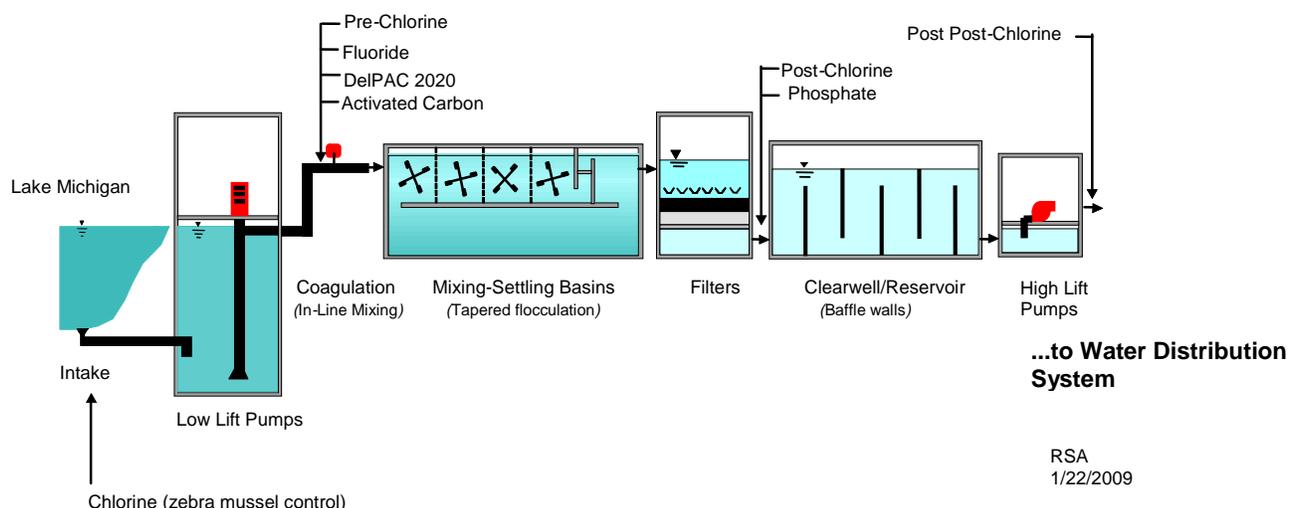
Following this, the pretreated water enters one of six slow mix basins for the **flocculation** step. In this step, “floc” particles are formed when alum reacts with the raw water, forming a sticky, gelatinous precipitate. Gentle mixing is applied in each basin causing the floc particles to collide with and entrain natural turbidity particles in the raw water. In the **sedimentation** step that follows mixing, 90% of these floc particles settle out.

After sedimentation, the treated water is delivered to the dual media filters for the final polishing step, **filtration**. The filtered water receives a second (post) dose of chlorine to maintain a residual in the distribution system and a dose of ortho-polyphosphate (for corrosion inhibition in the water mains) before entering the water plant’s underground clearwell/reservoirs.

From these reservoirs, the water is pumped under pressure to the distribution system using high lift pumps. This **distribution** step consists of filling the 4.0 million gallon (MG) standpipe and the 3.0 MG reservoir/pumping station to supply the needs of the residents of Wilmette, Glenview and portions of Prospect Heights. Under peak pumpage conditions, usually experienced on hot summer days, the 3.0 MG reservoir/pumping station is used to supplement the high lift pumping capacity.

Please refer to the process schematic below for additional details:

Wilmette Water Plant Process Schematic



Wilmette Water Plant 2009 Laboratory Data

Raw Water Quality

Month	Temp. C°	Turbidity NTU	pH	Odor** TON	Alkalinity mg/l	Hardness mg/l	Microbiological * C/100ml
January	1.6	10.7	8.08	0Cc-0M	115	146	0
February	2.2	6.3	8.13	0Cc-0M	118	149	0
March	3.3	18.1	8.16	0Cc-0M	114	143	0
April	6.7	14.3	8.19	0Cc-0M	114	145	0
May	11.2	2.0	8.31	0Cc-0M	108	135	0
June	13.9	1.9	8.40	0Cc-0M	108	134	0
July	18.3	1.6	8.46	0Cc-0M	108	133	0
August	13.3	1.7	8.31	2Cc-0M	108	134	0
September	19.1	3.0	8.33	2Cc-0M	108	134	0
October	13.2	6.3	8.26	0Cc-0M	109	134	0
November	10.3	3.9	8.23	0Cc-0M	108	133	0
December	4.3	11.7	8.16	0Cc-0M	109	134	0
Avg.	9.8	6.8	8.25	0Cc-0M	111	138	0

Tap Water Quality

Month	Temp. C°	Turbidity NTU	pH	Odor TON	Alkalinity mg/l	Hardness mg/l	Fluoride mg/l	PO ₄ mg/l	Microbiological C/100ml	NC/100ml
January	1.8	0.05	7.80	2Cc-0M	112	143	1.07	0.27	0	0
February	2.4	0.05	7.80	2Cc-0M	114	147	1.08	0.26	0	0
March	3.5	0.05	7.79	1Cc-0M	108	141	1.07	0.25	0	0
April	6.8	0.05	7.82	2Cc-0M	109	146	1.06	0.25	0	0
May	11.3	0.05	7.89	1Cc-0M	105	135	1.07	0.25	0	0
June	14.0	0.06	7.97	2Cc-0M	104	134	1.08	0.26	0	0
July	18.4	0.07	7.98	2Cc-0M	105	131	1.09	0.25	0	0
August	13.3	0.05	7.91	2Cc-0M	106	133	1.08	0.26	0	0
September	19.1	0.05	7.90	2Cc-0M	105	133	1.08	0.30	0	0
October	13.4	0.06	7.87	3Cc-0M	106	134	1.05	0.30	0	0
November	10.4	0.05	7.85	3Cc-0M	106	133	1.06	0.25	0	0
December	4.6	0.05	7.81	1Cc-0M	105	134	1.06	0.29	0	0
Avg.	10.0	0.05	7.87	2Cc-0M	107	137	1.07	0.27	0	0

Notes: C/100ml = coliform per 100 ml; NC/100ml = non-coliform per 100 ml; TON = threshold odor number; PO₄ = phosphate residual

*Microbiological Data reflects the average daily values. Raw water values were "0" in 2009 due to chlorine feed ahead of the raw water sample location.

**Raw Water Threshold Odor Numbers (TON) numbers reflect a chlorine odor during summer months due to the chlorination of raw water prior to sampling. Cc = chlorine, M = musty, Df = fishy

Wilmette Water Plant 2009 Meter Shop Summary

Month	Repaired/New Meters Installed				Buy Meters	Meter Size	Buy AMR
	Repaired Meters	New Meters	Total Meters	Total AMRs*			
January	25	6	31	49	1	1"	100
February	43	6	49	90	---	---	209
March	50	3	53	111	---	---	---
April	27	11	38	78	---	---	---
May	50	5	55	80	---	---	200
June	42	6	48	78	---	---	---
July	7	15	22	60	---	---	---
August	20	0	20	46	30	1"	222
September	9	2	11	39	---	---	7
October	32	4	36	98	---	---	---
November	48	4	52	101	---	---	263
December	34	3	37	54	---	---	---
Total	387	65	452	885	31	---	1001

* AMR= Automatic Meter Reading

Inventory				
	Repaired Meters**	New Meters	Meter Total	AMR Total
On Hand, 12/31/08*	573	77	646	537
Added to Inventory Installations	261	31	291	1001
On Hand, 12/31/09*	387	65	452	885
	447	43	490	653

*Inventory determined by a physical count

**Repaired meter inventory counts are estimated

Customer Service

Meter Inspect	58	Field Test Meters	6	Demolitions	22
AMRs Reads	28,787	Replace Meters	452	Leak Check	1
AMR Read hrs	225	Replace AMRs	250	Pressure Test	1
Final Bill Reads	496	Set new AMRs	635	High Water Bill	13
Finance Reads	49	New Meters	65	B-Box Repairs	15
Turn On/Off Svc	43	Collections	193	B-Box Locate	7

Large Meter Replacements (3" & larger)

Address	Size	Mfg
711 Laramie	30T	ME
165 Greenbay	20T	ME

Note: BA = Badger Meter Co.; ME = Metron Meter Co.

2009 Capital Improvements



The **Evanston Wilmette Inter-connection** provides for the design and construction of a new emergency interconnection between the Evanston and Wilmette water systems. In 2008, MWH Americas Inc. was selected as the Engineer and they began design of the pipeline and associated pumping

station. In 2009, MWH completed the specifications and assisted Evanston and Wilmette with an application for a low interest loan with the IEPA for construction. Construction is expected to start during the winter of 2011, budget permitting.

The **SWPS Electrical Improvements** included electrical improvements at the Storm Water Pumping Station (SWPS), and the installation of an 800 kW emergency generator to provide an alternate source of power during storm periods. The generator bid was awarded to Cummins NPower for \$341,387 in October 2008. The construction contract bid was awarded to Aldridge Electric for \$437,000 at the May 26, 2009 BOT meeting.

In 2009, Aldridge Electric installed the generator on a pad to the south of the station, an automatic transfer switch (ATS) for transferring power control from ComEd to generator, new MCCs for station pumps 1-3, new power wiring for pumps 1&2 and surge protectors for the station equipment. The Village assisted the contractor with station shutdowns to coordinate work with station pumping operations. Station equipment was operated manually by staff during storm



periods. Electrical Improvements work started in July 2009 and will be completed by January 2010.

Aldridge Electric unloads the new 800 kW genset at the SWPS in August 2009. This generator will power the station pumps in the event that both ComEd power lines to the station fail.

Water plant staff continued to evaluate **energy efficiency improvements** at the water plant in 2009. An intern was provided by the State of Illinois in the summer of 2009 to assess plant energy use and provide recommendations. In addition, the Illinois Department of Commerce and Economic Opportunity (DCEO) did a one day survey and provided an Energy Evaluation and Recommendation report. The reports suggested conversion of older lighting fixtures to new T-8 fluorescent fixtures, upgrading to high efficiency motors, and insulation of heating system piping were all projects that would pay back in energy savings within a few years. Plant staff made the following energy efficiency improvements in 2009:

- Installed new T-8 fixtures in 1933 entrance, the high and low lift areas, and the 1956 filter hall high ceiling area, replacing the existing metal halide high bay lamps;
- Installed new compact fluorescent wall fixtures in the 1956 washwater pump and the 500 kW generator areas, replacing metal halide wall fixtures.
- Tested efficiency of all low lift and high lift pumps to determine optimal combinations;
- Installed a new premium duty motor for high lift pump 4 when the old motor failed;
- Began to install occupancy light sensors in office areas and restrooms;
- Took basin 1&2 out of service for a trial period. This trial, if successful, will reduce energy costs (mixers) and will reduce the frequency of basin cleaning, saving on labor costs.

The Village of Wilmette continued installing **Automatic Meter Reading (AMR)** using the Badger Meter Co.'s Orion radio read system. AMR obtains digital readings by driving/walking near the customer's meter and stores readings in a handheld device called a Read-All. The data collected can be downloaded to the billing system to automate the billing process. The Meter Shop staff installed 885 AMR conversions in 2009, bringing the total to 7,658. At the current rate of installation, all 9,050 Village water meters will be converted to AMR by 2011.

The Village also worked on the following capital projects at the water plant in 2009:

- **Standpipe Reconditioning Project (04-M-1314)** Tank Industry Consultants (TIC) completed a study of the condition of the exterior of the tank and evaluated the antennas in August 2008. The study determined that painting could be safely performed with the antenna equipment in place and operating. In 2009, the Village hired TIC to complete the specifications and applied for a low interest SRF loan with the Illinois EPA. The reconditioning work on the tank has been delayed until 2011, pending loan approval.
- **Water Plant Masonry Repairs (2008-M-4002 design; 08-M-0019 construction).** This work includes brick repairs and tuckpointing at the Water Plant. Contract for Water Plant Masonry Repairs work was awarded to Sandsmith Inc. for the not-to-exceed amount of \$70,564.50 at the September 9, 2008 Board of Trustees (BOT) meeting. Masonry repair work started in September 2008 and was completed in April 2009.

Note: Only the south face of the 1933 building and the Roundhouse building could be repaired under this budget. Balance of masonry repairs have been deferred until 2011-2012.

- **Water Plant 1933 Filters Washwater Troughs Replacement (08-M-0015).** This work includes the replacement of the filter washwater troughs for filters 1-4. The contract was awarded to Mosele & Associates at the August 26, 2008 BOT meeting in the amount of \$119,000. Construction work was completed by May 2009.



Mosele & Associates mount a new washwater trough in the 1933 filters. These new troughs have improved the backwash process efficiency since their installation.

- **SWPS Building Repairs (2008-M-4002 design; 08-M-0018 construction).** This work includes tuckpointing and building repairs at the Storm Water Pumping Station (SWPS). A

contract for the SWPS Building Repairs work was awarded to Master Project, Inc. for the not-to-exceed amount of \$87,000 at the September 23, 2008 BOT meeting. Building repair work started in October 2008 and was completed in June 2009.

2009 Maintenance & Improvements

The following water plant maintenance tasks were completed **in-house** by plant staff in 2009:

- Cleaned basins 1-6 and pumped sediment to the MWRDGC in the spring and fall of 2009. Cored additional floor holes in basins 5&6 influent chamber to facilitate washing and installed a hoist rail system over basins 3-6 to facilitate grease lubrication of roller bearings.
- Performed the following painting work in 2009: prepared and painted filters 8-10 effluent piping and doorways, doors and window frames in the 1933 building.
- Cleaned, reorganized and painted the 1971 materials storage room. Relocated air compressor for dust collection system to inside the room, and installed a new interior door to the 1971 hall.
- Installed two additional peristaltic metering pumps (replacing hypo pumps 4 & 6) for the sodium hypochlorite feed system to help improve feed control and minimize the effect of chlorine gas accumulation in the suction and discharge pipelines.
- Replaced motor for high lift pump 4 after testing & attempts to repair – motor trip problem in 2008 was traced to a motor windings issue, and not a problem with the MCC.
- Installed conduit and wiring to “hard wire” the hypo metering pumps 4 & 6 to PLC-B to improve reliability of operation.
- Continued replacing labyrinth seals on



Joe Montcalm and Jerritt McMillon are shown here removing high lift pump 4 motor for replacement in 2009.

Cooper roller bearings in basins 3-6. Some seals had failed during normal expansion-contraction of the driver shaft.

- Installed and programmed a new PLC based control system for wetwell 1 and installed a new bubbler line to better control pump operation.
- Added additional anthracite filter media to filters 1-4.
- Installed wiring to filters 1-4 surface wash valves to facilitate upgrade to motorized valve operation and installed a Rotork motorized operator on filter 3 to replace a failed pneumatic valve operator.
- Installed new rubber seals on filters 9 & 10 drain valves to reduce leakage to wetwell 2 during normal operation.
- Completed over 406 maintenance repair tasks in 2009.
- Completed over 191 preventative maintenance routes in 2009.

The following water plant maintenance tasks were **contracted out** in 2009:

- Performed routine preventative maintenance on water plant emergency generators. (Powertron, Inc.);
- Replaced bearings, repaired bottom bearing journal on high lift pump 5 motor (General Servo & Spindle);
- Pump seals for high lift pump 5 began leaking severely in 2009. Pump was sent out for new bearings, mechanical seals and impeller replacement (ETM, Inc.). Repair work will be completed in January 2010.



Mosele & Associates shown here testing the zebra mussel control lines for leaks with compressed air in the sailing beach area. Two leaks were successfully located underwater and repaired by a diving contractor, Global Infrastructure..

- Located the leak(s) in the 1971 zebra mussel line in the lake using compressed air injected in the pipe (Mosele & Associates). Repairs were made in two locations by excavating and installing SS repair clamps over the circumferential cracks. (Global Infrastructure LLC).
- Replaced washwater pump 24 Zurn coupling between pump and motor, with employees assistance (ETM, Inc.);
- Replaced vault "A" hatch, installed new electric line for vault to wetwell 1 dry pit and installed vault sump pump discharge line to wetwell 1 and repaired driveway opening. (Mosele & Associates). Village staff cleaned out the vault, installed power wiring and connected sump pump discharge line;

The tenth annual **Water Quality Report** was mailed to all residents of Wilmette with the June-July 2009 issue of the Communicator. This report once again demonstrated that Wilmette's water meets or surpasses all State and Federal regulations regarding water quality. Congratulations to all employees of the Engineering and the Public Works Departments for their excellent work!

The following tasks were completed at the **3.0MG Reservoir** in 2009:

- Performed weekly equipment checks at the reservoir.
- Performed PM on the 275 kW generator. (Powertron, Inc.)
- Replaced the reservoir building flooding alarm
- Station flooding occurred in April 2009 when a Village Yard (VY) contractor pumped groundwater at the Yard construction site into a manhole leading to the station. Water Plant staff cleaned up, replaced damaged equipment and repaired the footing drain pumps. The VY contractor was charged for the cleanup and repair costs;
- Reservoir booster pump 3 discharge valve was removed and sent out for repairs in 2008. (Apco-Willamette Valve & Primer Co.). Repairs were completed and the valve was reinstalled in the spring of 2009.

The following tasks were completed at the **Storm Water Pumping Station (SWPS)** in 2009:

- Performed weekly equipment checks at the SWPS;
- Completed SWPS Electrical Improvements (see page 11 for details)

2009 Operations

The water plant did not need to feed activated carbon in 2009 for **taste and odor control**; there were fewer calls from residents than in past years. The carbon feed system was “exercised” in January and February to insure readiness.

The Village continued to use Carus F-35, an ortho-polyphosphate product, for the **control of lead corrosion** in the water distribution system. Since beginning feeding phosphate based chemicals in January 1994, the lead levels at high-risk sites (those with lead service lines) have been reduced by 75% or more.

The Village maintained their membership in the **Partnership for Safe Water** in 2009. The Partnership is a voluntary organization with over 200 member utilities nationwide. The goal of the Partnership is to provide a higher level of treatment by optimizing treatment plant performance, thus increasing protection against microbial contamination in the treated water supply. The Village again received the **Director’s Award** from the Partnership in 2009, one of the nation’s highest honors in the water treatment industry.

Coagulant chemicals are used to help remove turbidity from the raw water during the treatment process. After conducting a year-long **coagulant trial** in 2008, the water plant switched to DelPAC 2020 in November 2008. DelPAC out-performed alum during the trial by improving settled and finished water turbidity using a lower dose and by extending filter runs. The annual savings in coagulant costs by switching to the DelPAC is estimated at \$28,000.

The water plant low lift pump stations were operated as follows in 2009:

- 1933 low lift pumps were used for 49 days during November and December.
- 1971 low lift pumps were used for 317 days, during remaining months. During the coagulant trial period, both the 1971 and 2003 low lift pump discharge lines were used.



Manuel Morales, Water Plant Operator, adjusts the coagulant chemical feed pumps during the coagulant chemical trial in 2008. The water plant began using DelPAC 2020 after the trial, saving the Village money in reduced chemical costs and lower MWRDGC charges for basin cleaning desedimentation.