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Per- and Polyfluoroalkyl Substances (PFAS) Treatment Evaluation

Presentation for City Council Work Session

October 27, 2025

Crest Hill
CITY OF NEIGHBORS

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Today's Agenda

- City's Water Supply and Current PFAS Regulations
- Review of Five Possible PFAS Treatment Alternatives
  - Alternative 1 – Remove Affected Wells from Supply
  - Alternative 2 – Install Treatment Systems to Reduce PFAS in Affected Wells
  - Alternative 3 – Provide Point-of-use Treatment Systems to Residents
  - Alternative 4 – Purchase Water from Another System
  - Alternative 5 – Drill Deeper Wells in Sandstone Aquifer (Currently PFAS Free)
- Anticipated Implementation Schedules
- Opinion of Probable Cost Comparison

Crest Hills Current Well Supply Source

- Crest Hill's source for water is from the Silurian Dolomite aquifer
- 8 shallow wells
- Two pressure zones (3-High zone wells, 4-low zone wells, 1 well serves both zones)
- Silurian Dolomite is rapidly recharged from surface water run-off making it susceptible to contamination
- The City is in the process of switching to treated Lake Michigan water supply from the Grand Prairie Water Commission
- Anticipated switch in mid 2030

Well #	Drill Year	Well Depth (ft)	Typical Pumpage (gpm)
Well No. 1	1963	303	400 to 450
Well No. 4	1951	300	400 to 450
Well No.7	1979	296	350 to 400
Well No. 8	1995	320	400 to 450
Well No. 9	1999	301	250 to 300
Well No. 10	2002	325	250 to 300
Well No. 11	2002	301	200 to 300
Well No. 12	2014	300	400

Changes to Drinking Water Regulations Confirm Past Decisions and Prompt Consideration for Temporary Action

- United States Environmental Protection Agency (USEPA) proposed enforceable regulations for six PFAS compounds in drinking water as of April 10, 2024

PFAS Compound	Acronym	MCL	Units
Perfluorobutanesulfonic acid	PFBS	2000	ppt or ng/L
Perfluorohexanesulfonic acid	PFHxS	10	ppt or ng/L
Perfluorononanoic acid	PFNA	10	ppt or ng/L
Perfluorooctanoic acid[b]	PFOA	4	ppt or ng/L
Perfluorooctanesulfonic acid[b]	PFOS	4	ppt or ng/L
Hexafluoropropylene oxide dimer acid (GenX)	HFPO-DA	10	ppt or ng/L

*MCL = Maximum Contaminant Level ppt = Part Per Trillion ng/L = nanogram per liter

- Illinois Environmental Protection Agency (IEPA) adopted the USEPA limits in March 2025
- The municipality must provide routine notification to the public with information on the levels of these compounds in drinking water starting in 2027
- Current regulations require compliance with MCLs (Maximum Contaminant Levels) by April 2029

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Historical Sampling Shows Four of the City's Wells Have Exceeded Recently Established Maximum Contaminant Levels (MCLs)

- Based on data provided by City from testing conducted between March 2021 and July 2025
- Results shown are not chronological. Data Reflects the lowest and highest sample results.

PFAS Compound	MCL	Units	Well 1	Well 4	Well 7	Well 10
PFOA	4	ppt or ng/L	9.0-15.0	ND–2.5	3.0-8.0	4.6-13.0
PFHxS	10	ppt or ng/L	4.0-6.4	9-11	ND	1.9-5.0

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Five Alternative Approaches to Treating for PFAS in Crest Hills Water Supply Were Evaluated Conceptually

Alternative #1: Remove Wells Affected by PFAS from Operation

Alternative #2: Install Systems to Treat for PFAS in Affected Wells

Alternative #3: Provide Residents Point-of-Use Treatment Systems for PFAS

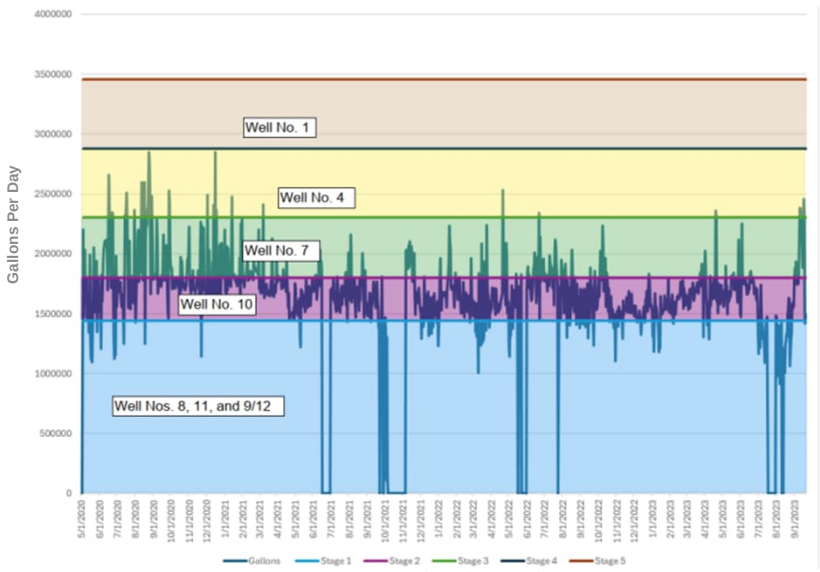
Alternative #4: Purchase Treated Water From a Neighboring Water Supply

Alternative #5: Drill New Deep Sandstone Wells and Remove PFAS Affected Wells from Supply

Alternative #1: Remove Wells Affected by PFAS from Operation

- Reducing or eliminating the contribution from selected wells under a 24-hour pumping operation
  - **Stage 1:** Wells Nos. 8, 11, and 9/12 operated at all times
  - **Stage 2:** add Well No. 10
  - **Stage 3:** add Well No. 7
  - **Stage 4:** add Well No. 4
  - **Stage 5:** add Well No. 1
- Wells No. 7 and 10 were chosen as Stage 2 and 3 based on available space for treatment and historical record of less PFAS in the system
- Anticipated cost: $50,000 to $200,000 and includes PFAS monitoring within the distribution system

24-Hour Well Operation



Date: May 1, 2020 through September 30, 2023

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Alternative #2: Install Systems to Treat PFAS in Affected Wells

- Provide short term treatment options until treated water from Lake Michigan is available
- Investigated four treatment approaches, including:
  - Reverse Osmosis (RO)
  - Anion Exchange (AIX)
  - Flourosorb
  - Granular Activated Carbon (GAC)
- All are likely to be considered as emerging technologies for PFAS treatment and will require Pilot Studies prior to permit approval

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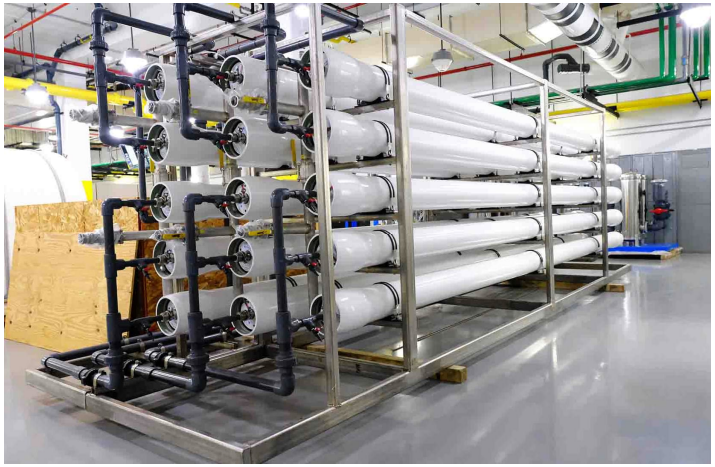
Treatment Technology Options

- 2A – Reverse Osmosis (RO):
  - Treats water by using a semi-permeable membrane that separates water molecules from unwanted substances
  - Pretreatment likely required
  - Significant water quality changes will trigger a Corrosion Control Treatment (CCT) Study in addition to Pilot Study
  - Waste stream contains concentrated PFAS which must be handled with treatment
  - This treatment approach at the affected wells is not recommended



Source: Surplus Management, Inc. dba WaterSurplus

Treatment Technology Options

- 2B – Anion Exchange (AIX):
  - Uses positively charge anion exchange resins to treat negatively charged containments like PFAS in exchange for introducing additional chlorides ions into the treated water
  - Many negatively charged ions, in addition to PFAS will be treated
  - Media must be replaced when exhausted
  - PFAS ownership on spent media currently in question/under review
  - If treatment is chosen, this approach should be further discussed

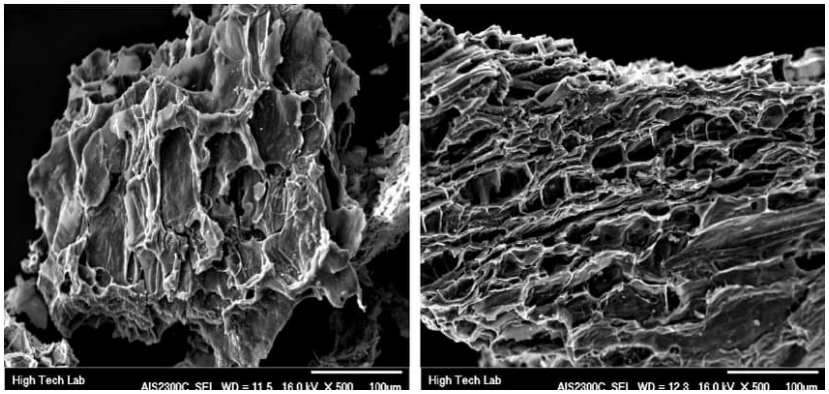
Source: Surplus Management, Inc. dba WaterSurplus

Treatment Technology Options

- 2C – Fluoro-Sorb:
  - Surface Modified Clay absorbent that specifically targets only Fluorinated Compounds
  - No competing contaminants results in longer media life, less media exchanges
  - Piloting in other areas showing spike breakthroughs and other issues
  - If treatment is chosen, this approach should be further discussed

Treatment Technology Options

- 2D – Granular Activated Carbon (GAC):
  - Adsorption media derived from coal or coconut shells that are activated using high pressure and head to create a pore structure
  - PFAS and many other contaminants will be adsorbed
  - Exhausted media change out is required, but can be reactivated
  - Incineration destroys the PFAS, but saves about 90% of the GAC for reuse
  - Recommend treatment approach



Source: Thermo Fisher Scientific

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Treatment Technology Manufacturers

Equipment Manufacturers	
Desotec: GAC Supplier	• Rental Units • Set up the site to insert and swap units • Can reactivate and reuse
Atec: provides effective treatment using media for adsorption performance across a wide range of PFAS compounds	• Purchase units and sell(?) after switch • Multiple treatment approaches: AIX, GAC, and Fluoro-sorb, all require media exchange • Require pretreatment
WaterSurplus: provides effective treatment using media for adsorption performance across a wide range of PFAS compounds	• Purchase units and sell(?) after switch • Multiple treatment approaches: AIX and GAC, both required media exchange • Would need to rebuy resin roughly 1-2 years • Require pretreatment

- Cost is estimated at **$1,000,000 to $2,000,000** for each site

Source: www.desotec.com

Source: Surplus Management, Inc. dba WaterSurplus

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Alternative #3: Provide Residents Point-of-Use Treatment Systems for PFAS

- Two point-of-use treatment options
- City to install and maintain and routinely test at each location
- Not likely to achieve compliance with the IEPA

Point-of-Use Treatment Options	
RO Systems	**Carbon Filters**
• Whole house systems • Under the sink systems	• Whole house systems • GAC pitcher filters
• Opinion of cost: **$6,000,000 including install only** • This option is not recommended	• Opinion of cost: **$2,000,000 including replacement filters every three months for five years** • Distribution issues need to be addressed for this option

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Alternative #4: Purchase Treated Water From a Neighboring Water Supply

- City of Joliet is the only viable neighboring water supply
  - Will require future discussions with City of Joliet to understand available supply capacity and willingness to sell
- IEPA will not typically allow a blended water distribution system. Similar situations have required 100% switch to one water source or blending before entering the system.
- CCT Study would be required
- Two Interconnects
  - Gaylord Road and Division Street
  - Intersection of Theodore Street and Plainfield Road
- Total cost with contingency is estimated at **$8,250,000**
- Annual cost to purchase water would be about **$11,600,000** in 2025 dollars and could increase annually

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Alternative #5: Drill New Deep Sandstone Wells and Remove PFAS Affected Wells from Supply

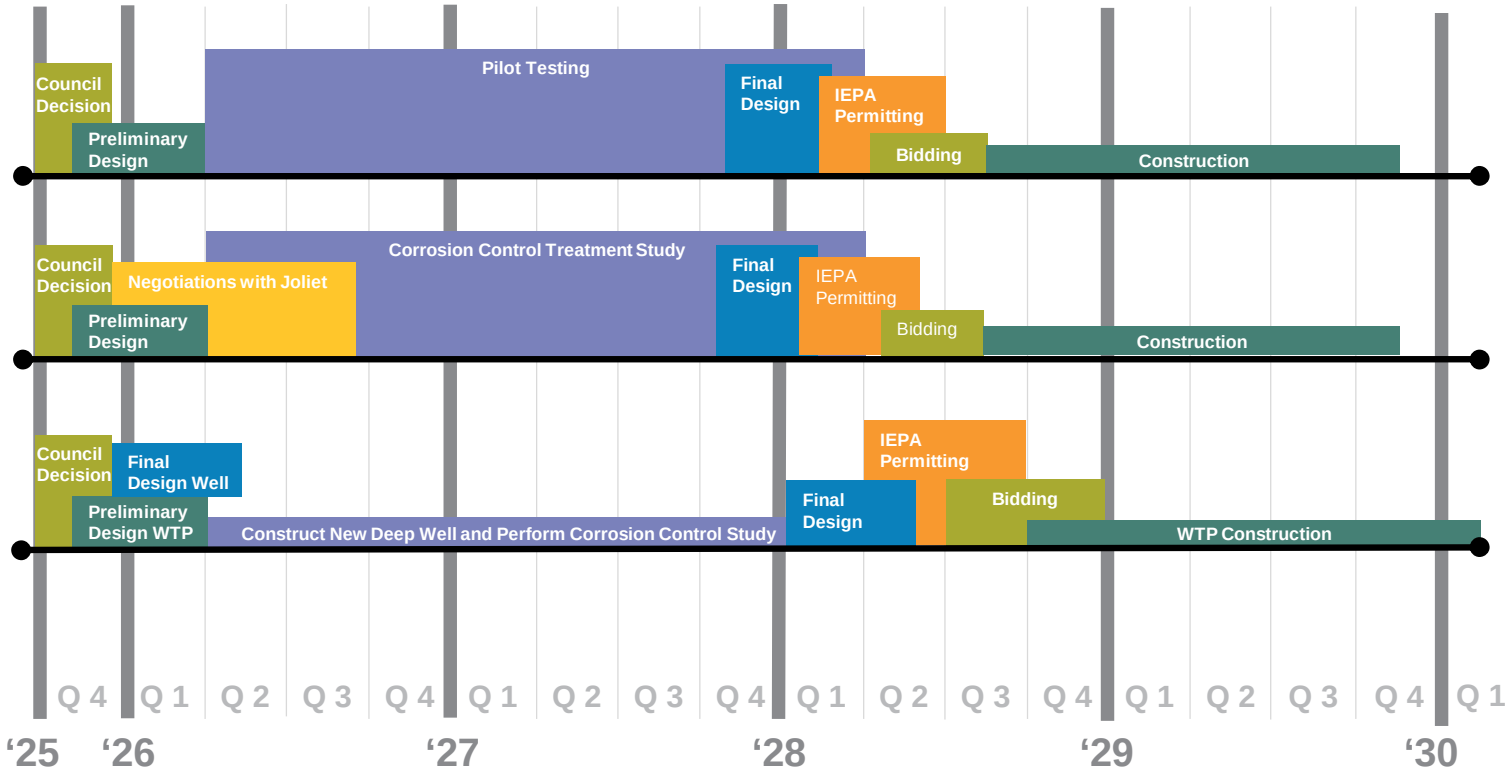
- 1000 gpm deep well into the deep sandstone, Iron-Galesville aquifer, which contains no PFAS
- Wells 1,4,7, and 10 could be placed on standby and only used in peak demand periods
- Water treatment will be needed to reduce naturally occurring radium from the deep well supply
- Deep well and shallow well water would not be able to blend in the distribution system
- Raw water mains and centralized treatment would be necessary
- IEPA will require a CCT study for the impacts of blending of shallow and deep well water
- Total probable cost, including the CCT study and raw water main, is estimated at **$21,750,000**

Anticipated Implementation Schedules

Alternative 2: Install Treatment at Wells 7 & 10

Alternative 4: Install City of Joliet Interconnection

Alternative 5: Construct New Deep Well and WTP



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Cost Comparison

Cost Comparison		
Alternative	**Opinion of Probable Cost (2025 Dollars)**	**Staff Recommended**
1. Staging of Well Supply	$50,000 to $200,000 per year	Yes
2. Short Term Treatment	$2,000,000 to $4,000,000	Discuss further action
3. Point-of-Use Treatment	$2,000,000	Discuss further action
4. Alternate Water Supplier	$8,250,000 then $11.6M annually to purchase water	No, time restraint
5. Deep Well Installation	$21,750,000	No, time restraint

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Questions?

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