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Strand Associates, Inc.®

Per- and Polyfluoroalkyl Substances (PFAS) Pilot Study Proposals

Pilot Study Proposal Review Session

June 9, 2026

Crest Hill
CITY OF NEIGHBORS

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Today's Agenda

- Pilot Overview
- PFAS Pilot Vendors
- Full-Scale System
- Cost Comparison

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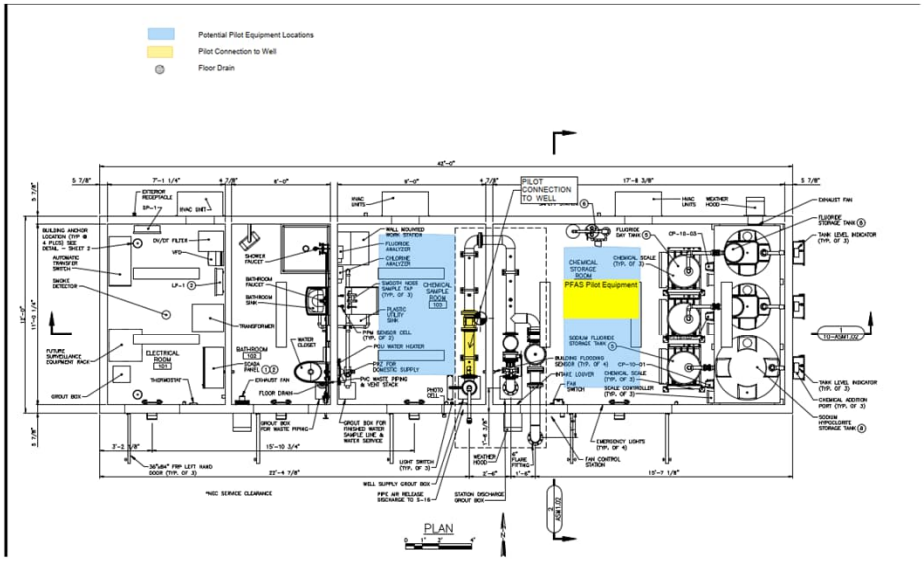
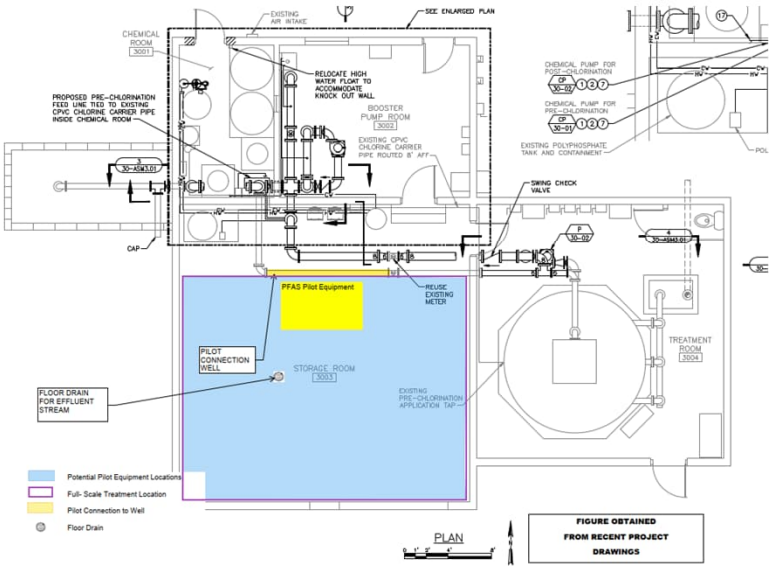
Crest Hills Well 7 and 10



Well #	Drill Year	Well Depth (ft)	Typical Pumping Rate (gpm)	Latest PFOA results (ppt)
Well No.7	1979	296	350 to 400	7.23
Well No. 10	2002	325	250 to 300	5.35



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USEPA and IEPA Standards

- USEPA proposed enforceable regulations for six PFAS in drinking water as of April 10, 2024.
- PFOA, PFOS, PFNA, PFHxs, PFBS, HFPO-DA
- Illinois adopted the USEPA limits in March 2025.
- The municipality must provide a notification to the public with information on the levels of these compounds in drinking water starting in 2027.
- Four of the City's eight wells have historical sampling results in excess of new limits.

PFAS Compound	MCL (ppt)	Units	Well 1 (ppt)	Well 4 (ppt)	Well 7 (ppt)	Well 10 (ppt)
PFOA	4	ppt or ng/L	15	-	8	13
PFHxS	10	ppt or ng/L	-	11	-	-

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PFAS Pilot Vendors

- **ATEC**: IX, GAC, Fluro-sorb
  - Pilot equipment: 5’ L x 3’ W x 8’ T
  - Water Quality Samples: Monthly ; PFAS Samples: Weekly, Final PFAS Report
  - Rapid Small Scale Column Test: Short test time: 24 hours a day/ 7 days a week
  - Need to Hire third party for Waste Disposal
- **Sentinel Water Solutions**: IX system Recommended
  - Cartridge filter for Iron and manganese just in case
  - Will transport Crest Hill waste to landfill
  - Bi-weekly testing, monthly progress reports, Final PFAS Report
  - Longer than 12 Month operation
- **Water Surplus**: IX System Recommended
  - Well 7: only operate when well is running due to iron in water(12-18 hrs)
  - Well 10: 24/7 Pilot operation and 500 gallon Tank
  - Anticipated 12-month operation
  - Water Quality Samples: Quarterly ; Iron: Weekly ; PFAS: Monthly
  - Need to hire third party for Waste Disposal via incineration

Figure 1. PFAS Pilot System

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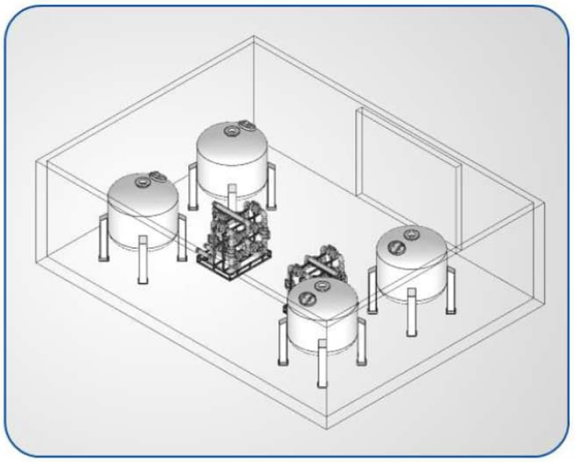
Full-Scale System

- **ATEC**: Will Provide exact drawings with Full-Scale system once the test determines the exact size and layout of the system.
  - Configuration will be a lead/lag system
- **Sentinel Water Solutions**: IX system: 72” diameter x 111” Height
  - both sites are designed for 5 min EBCT per train
  - Treatment Trains are split into two parallel trains of 2 vessels per train
  - capable of lead/lag, parallel, or single vessel isolation
- **Water Surplus**: IX System: Quad 48” x 60” for Well 7 and Triplex 48” x 60” at Well 10.
  - parallel configuration, which allows for backwash to be performed, even while filtered product water is forwarded to distribution.
  - Media typically removed using VAC truck. Support layer will be added and backwashed.
  - Semi-automatic: pilot valves will be in included and will be used to manually operate the 3-way backwash valves.



Sample Well 10 Layout

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Cost Comparison

Cost Comparison (IX system)			
	Atec	**Sentinel Water Solutions**	**Water Surplus**
Pilot Study Fee	$225,600	$106,500	$81,750
Full scale Treatment Well #7 (IX)	$315,346	$445,200	$662,690
Full scale Treatment Well #10(IX)	$224,610	$445,200	$647,690
Media Replacement Well #7(IX)	NEED	$87,000	$83,000
Media Replacement Well #10(IX)	NEED	$74,000	$68,000
Total		$1,277,000	$1,542,880

ATEC
A Cadiz Solution

Table 1
ATEC PFAS Adsorption System
Budgetary System Pricing & Design Details

Project Name:	**Crest Hill, IL**		
Engineering Consultant:	**Strand - Tanner Smid**		
Rep Company Details:	**LAI -**		
Proposal Prepared by:	**Kirk Newcomb - East Region Sales Manager**		
Proposal Prepared on:	**May 21, 2026**		
Full-Scale Equipment Design Criteria Summary			
Design Scenario:			
Well Name or Number:	**7**	**7**	**7**
Capacity, MGD	**0.6**	**0.6**	**0.6**
Plant Capacity (gpm)	400	400	400
PFAS Compounds (EPA Limit)			
PFOA (4 ppt)	unknown	unknown	unknown
PFOS (4 ppt)	unknown	unknown	unknown
PFHxS (10 ppt)	unknown	unknown	unknown
PFNA (10 ppt)	unknown	unknown	unknown
HFPO-DA (GenX) (10 ppt)	unknown	unknown	unknown
Hazard Index (PFHX, PFNA, HFPO-DA, PFBS) (unitless	unknown	unknown	unknown
Lead Vessels - Media Type	**FluoroSorb**	**Ion Exchange**	**GAC**
Diameter of Vessels, in	48	48	60
Vessel Sideshell Height, in	72	72	72
Diameter of Vessels, ft	4.0	4.0	5.0
Surface areas, per vessel, sq ft	12.6	12.6	19.63
Number of Vessels	2	2	6
Number of Filter Banks	1	1	1
Loading Rate, gpm/sq ft	15.9	15.9	3.4
Media type	FS	IX	GAC
Media Depth, in	50	50	55
Media, c.f.	105	105	540
EBCT, min	2.0	2.0	10.1
Lag Vessels - Media Type	**FluoroSorb**	**Ion Exchange**	**GAC**
Diameter of Vessels, in	48	48	60
Vessel Sideshell Height, in	72	72	72
Diameter of Vessels, ft	4.0	4.0	5.0
Surface areas, per vessel, sq ft	12.6	12.6	19.6
Number of Vessels	2	2	6
Number of Filter Trains	1	1	1
Loading Rate, gpm/sq ft	15.9	15.9	3.4
Media type	FS	IX	GAC
Media Depth, in	50	50	55
Media, c.f.	105	105	540
EBCT, min	2.0	2.0	10.1
Configuration & Pricing			
System Configuration	**2 x 2-72-48-FS50**	**2 x 2-72-48-IX50**	**2 x 6-72-60-GAC55**
Price per Filter Train	$ 89,165	$ 147,673	$ 304,800
Number of Filter Trains	2	2	2
Total System Price	$ 178,330	$ 295,346	$ 609,600
Shipping & Handling Fee	$ 20,000	$ 20,000	$ 20,000
Total	**$ 198,330**	**$ 315,346**	**$ 629,600**
System Description	Fully Skidded PFAS Adsorption System consisting of 1 lead banks followed by 1 lag banks of 2 pressure vessels of 48-inch diameter with 72-inch sidewalls including a 50-inch bed of FS media, controls, valves & header piping	Fully Skidded PFAS Adsorption System consisting of 1 lead banks followed by 1 lag banks of 2 pressure vessels of 48-inch diameter with 72-inch sidewalls including a 50-inch bed of IX media, controls, valves & header piping	Fully Skidded PFAS Adsorption System consisting of 1 lead banks followed by 1 lag banks of 6 pressure vessels of 60-inch diameter with 72-inch sidewalls including a 55-inch bed of GAC media, controls, valves & header piping

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ATEC: Full Scale GAC & Fluro-Sorb

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Proposal Prepared by:	Kirk Newcomb - East Region Sales Manager		
Proposal Prepared on:	May 21, 2026		
Full-Scale Equipment Design Criteria Summary			
Design Scenario:			
Well Name or Number:	7	7	7
Capacity, MGD	0.6	0.6	0.6
Plant Capacity (gpm)	400	400	400
PFAS Compounds (EPA Limit)			
PFOA (4 ppt)	unknown	unknown	unknown
PFOS (4 ppt)	unknown	unknown	unknown
PFHxS (10 ppt)	unknown	unknown	unknown
PFNA (10 ppt)	unknown	unknown	unknown
HFPO-DA (GenX) (10 ppt)	unknown	unknown	unknown
Hazard Index (PFHX, PFNA, HFPO-DA, PFBS) (unitless	unknown	unknown	unknown
Lead Vessels - Media Type	**FluoroSorb**	**Ion Exchange**	**GAC**
Diameter of Vessels, in	48	48	60
Vessel Sideshell Height, in	72	72	72
Diameter of Vessels, ft	4.0	4.0	5.0
Surface areas, per vessel, sq ft	12.6	12.6	19.63
Number of Vessels	2	2	6
Number of Filter Banks	1	1	1
Loading Rate, gpm/sq ft	15.9	15.9	3.4
Media type	FS	IX	GAC
Media Depth, in	50	50	55
Media, c.f.	105	105	540
EBCT, min	2.0	2.0	10.1
Lag Vessels - Media Type	**FluoroSorb**	**Ion Exchange**	**GAC**
Diameter of Vessels, in	48	48	60
Vessel Sideshell Height, in	72	72	72
Diameter of Vessels, ft	4.0	4.0	5.0
Surface areas, per vessel, sq ft	12.6	12.6	19.6
Number of Vessels	2	2	6
Number of Filter Trains	1	1	1
Loading Rate, gpm/sq ft	15.9	15.9	3.4
Media type	FS	IX	GAC
Media Depth, in	50	50	55
Media, c.f.	105	105	540
EBCT, min	2.0	2.0	10.1
Configuration & Pricing			
System Configuration	**2 x 2-72-48-FS50**	**2 x 2-72-48-IX50**	**2 x 6-72-60-GAC55**
Price per Filter Train	$ 89,165	$ 147,673	$ 304,800
Number of Filter Trains	2	2	2
Total System Price	$ 178,330	$ 295,346	$ 609,600
Shipping & Handling Fee	$ 20,000	$ 20,000	$ 20,000
Total	**$ 198,330**	**$ 315,346**	**$ 629,600**
System Description	Fully Skidded PFAS Adsorption System consisting of 1 lead banks followed by 1 lag banks of 2 pressure vessels of 48-inch diameter with 72-inch sidewalls including a 50-inch bed of FS media, controls, valves & header piping	Fully Skidded PFAS Adsorption System consisting of 1 lead banks followed by 1 lag banks of 2 pressure vessels of 48-inch diameter with 72-inch sidewalls including a 50-inch bed of IX media, controls, valves & header piping	Fully Skidded PFAS Adsorption System consisting of 1 lead banks followed by 1 lag banks of 6 pressure vessels of 60-inch diameter with 72-inch sidewalls including a 55-inch bed of GAC media, controls, valves & header piping

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Engineering Consultant:	Strand - Tanner Smid		
Rep Company Details:	LAI -		
Proposal Prepared by:	Kirk Newcomb - East Region Sales Manager		
Proposal Prepared on:	May 21, 2026		
Full-Scale Equipment Design Criteria Summary			
Design Scenario:			
Well Name or Number:	10	10	10
Capacity, MGD	0.4	0.4	0.4
Plant Capacity (gpm)	300	300	300
PFAS Compounds (EPA Limit)			
PFOA (4 ppt)	unknown	unknown	unknown
PFOS (4 ppt)	unknown	unknown	unknown
PFHxS (10 ppt)	unknown	unknown	unknown
PFNA (10 ppt)	unknown	unknown	unknown
HFPO-DA (GenX) (10 ppt)	unknown	unknown	unknown
Hazard Index (PFHX, PFNA, HFPO-D	unknown	unknown	unknown
Lead Vessels - Media Type	**FluoroSorb**	**Ion Exchange**	**GAC**
Diameter of Vessels, in	60	60	60
Vessel Sideshell Height, in	72	72	72
Diameter of Vessels, ft	5.0	5.0	5.0
Surface areas, per vessel, sq ft	19.6	19.6	19.63
Number of Vessels	1	1	6
Number of Filter Banks	1	1	1
Loading Rate, gpm/sq ft	15.3	15.3	2.5
Media type	FS	IX	GAC
Media Depth, in	48	48	41
Media, c.f.	79	79	403
EBCT, min	2.0	2.0	10.0
Lag Vessels - Media Type	**FluoroSorb**	**Ion Exchange**	**GAC**
Diameter of Vessels, in	60	60	60
Vessel Sideshell Height, in	72	72	72
Diameter of Vessels, ft	5.0	5.0	5.0
Surface areas, per vessel, sq ft	19.6	19.6	19.6
Number of Vessels	1	1	6
Number of Filter Trains	1	1	1
Loading Rate, gpm/sq ft	15.3	15.3	2.5
Media type	FS	IX	GAC
Media Depth, in	48	48	41
Media, c.f.	79	79	403
EBCT, min	2.0	2.0	10.0
Configuration & Pricing			
System Configuration	**2 x 1-72-60-FS48**	**2 x 1-72-60-IX48**	**2 x 6-72-60-GAC41**
Price per Filter Train	$ 58,424	$ 102,305	$ 304,800
Number of Filter Trains	2	2	2
Total System Price	$ 116,848	$ 204,610	$ 609,600
Shipping & Handling Fee	$ 20,000	$ 20,000	$ 20,000
Total	**$ 136,848**	**$ 224,610**	**$ 629,600**
System Description	Fully Skidded PFAS Adsorption System consisting of 1 lead banks followed by 1 lag banks of 1 pressure vessels of 60-inch diameter with 72-inch sidewalls including a 48-inch bed of FS media, controls, valves & header piping	Fully Skidded PFAS Adsorption System consisting of 1 lead banks followed by 1 lag banks of 1 pressure vessels of 60-inch diameter with 72-inch sidewalls including a 48-inch bed of IX media, controls, valves & header piping	Fully Skidded PFAS Adsorption System consisting of 1 lead banks followed by 1 lag banks of 6 pressure vessels of 60-inch diameter with 72-inch sidewalls including a 41-inch bed of GAC media, controls, valves & header piping

Questions?

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