CITY OF LOS BANOS

HEXAVALENT CHROMIUM (Cr(VI)) TREATMENT PILOT STUDY

DATE: September 2, 2026

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PROVOST&PRITCHARD

OUTLINE

- Background
  - Chromium-6 (Cr(VI)) Regulation
  - Source of Contamination
  - Compliance Timeline
  - Alternatives Considered
- Reduction-Coagulation-Filtration (RCF)
  - Pilot Study
  - Remaining Issues
- Cost Estimates
- Next Steps

BACKGROUND

Chromium-6 (Cr(VI)) Regulation

- Drinking water standard for Cr(VI) is unique to California.
- In 2014, California enacted a Cr(VI) limit of 10 parts per billion (ppb).
- In 2017, a judge ruled that the State did not follow the correct procedure in establishing the regulation and the State was ordered to rescind it.
- In 2024, the State again enacted a Cr(VI) limit of 10 ppb.
- The new rule was recently challenged in court, but the judge ruled in favor of the State.

BACKGROUND

Source of Contamination

- The Cr(VI) in the City's drinking water is naturally occurring.
- Contamination extends along the coastal mountains from Los Banos north to at least Patterson.
- All 13 of the City's wells are out of compliance with the new rule.

Compliance Timeline

- The regulation requires large water systems, including Los Banos, to comply by October 1, 2026.
- Given the unusual challenge the regulation created for the City, Los Banos submitted a Corrective Action Plan to the state requesting an extension until December 2030, which the State granted.

ALTERNATIVES CONSIDERED

Non-Treatment

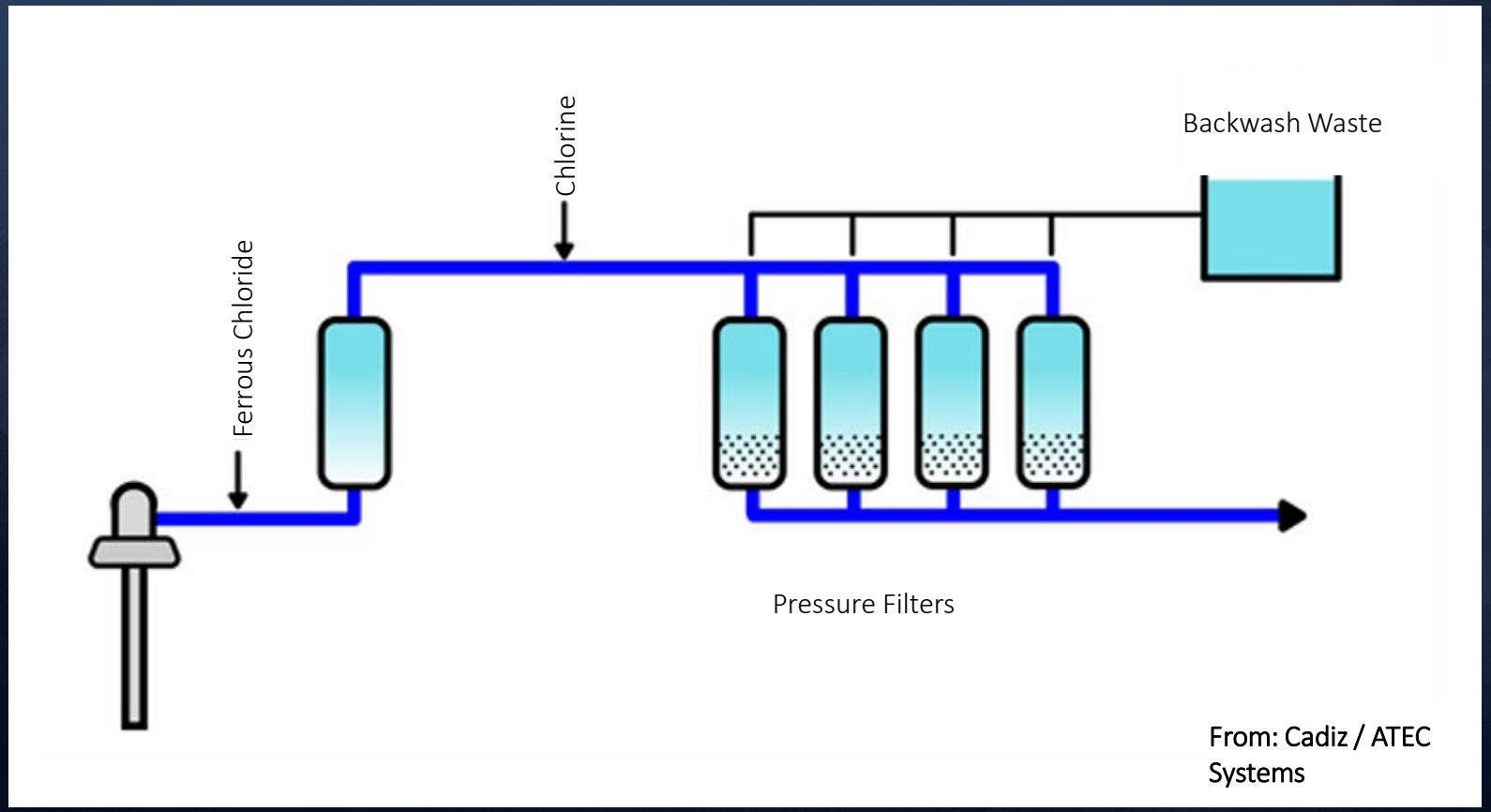
- Drilling replacement wells
- Blending
- Consolidation

Treatment

- Surface water treatment
- Ion exchange
- Reverse osmosis
- Zero valent iron
- Reduction-Coagulation-Filtration

REDUCTION-COAGULATION-FILTRATION (RCF)

- Cr(VI) is converted into Cr(III) using the chemical ferrous chloride
- Cr(III) is filtered out using conventional or specialized filters



From: Cadiz / ATEC Systems

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RCF PILOT STUDY

Pilot Study: A scaled down, usually portable, treatment plant that can be used to simulate the performance of a full-size treatment plant.

- RCF treatment of drinking water for Cr(VI) is new.
  - Research into the treatment process has been limited.
  - Few RCF treatment plants are in operation.
- A reduced scale Pilot Study was needed to:
  - Confirm that the process would work with Los Banos water.
  - Establish design and operating parameters.
  - Allow for better estimates of capital and operating costs.

RCF PILOT STUDY

- Study was conducted in two phases during October 2025 and February 2026
- The process reduced Cr(VI) to below the State's limit
- However, challenges remain.
  - Relatively frequent backwashing of the filters was required.
  - Backwash water will be difficult to handle on-site. Discharge into the sewer is recommended.
  - Chromium levels in the treated water rose when restarting after the filters had been offline.

ESTIMATED COSTS

- Planning-level estimated costs to construct a treatment plant:
  Between $2.7 million–$4.8 million per well
- Estimated cost to construct treatment plants at
  all 13 of the City's wells: $42 million
- Estimated annual operating costs: **$1.25 million**

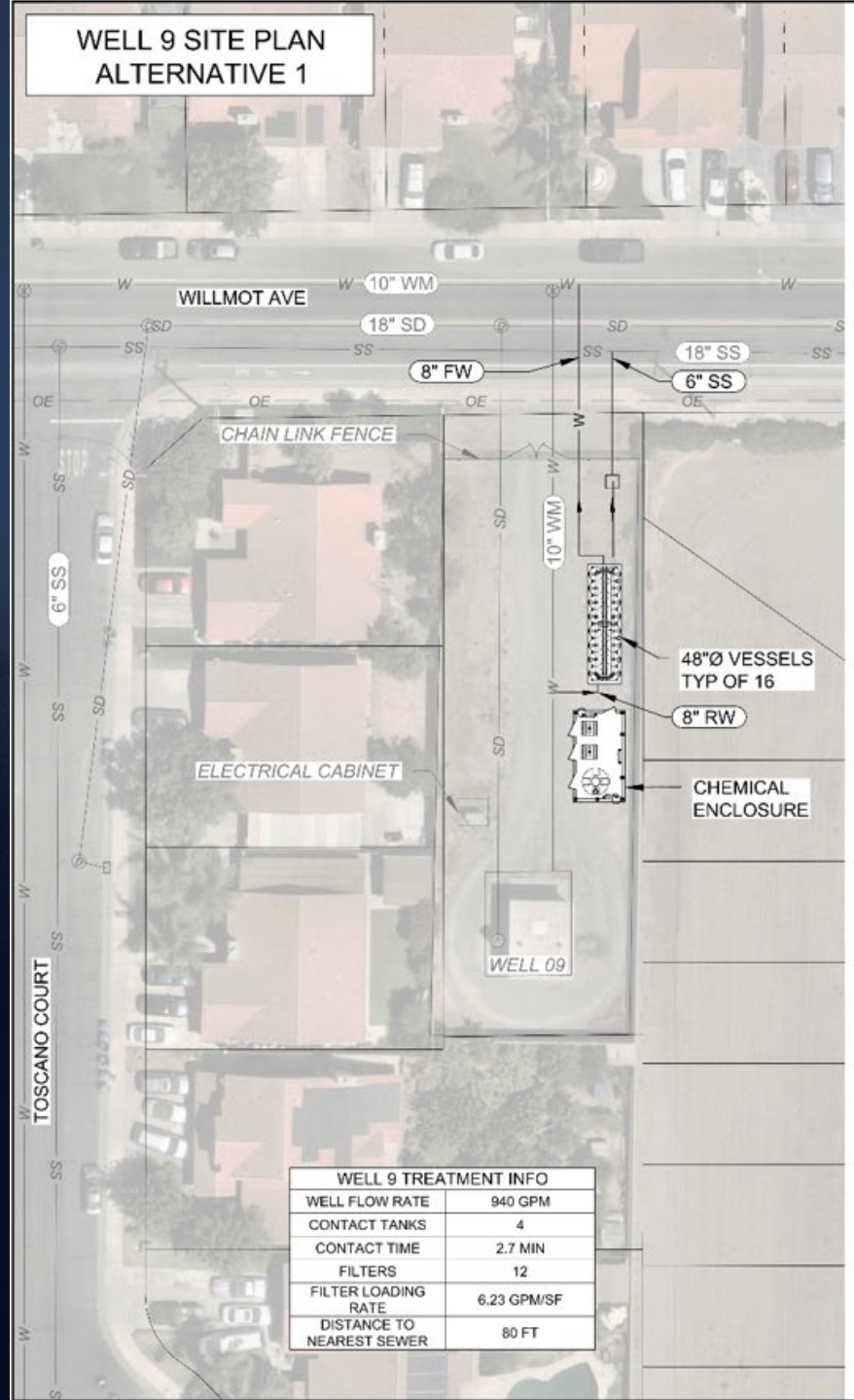
PROPOSED NEXT STEP

It is proposed that a full-scale treatment plant be constructed at Well 9.

Once constructed, this treatment plant would allow the City to:

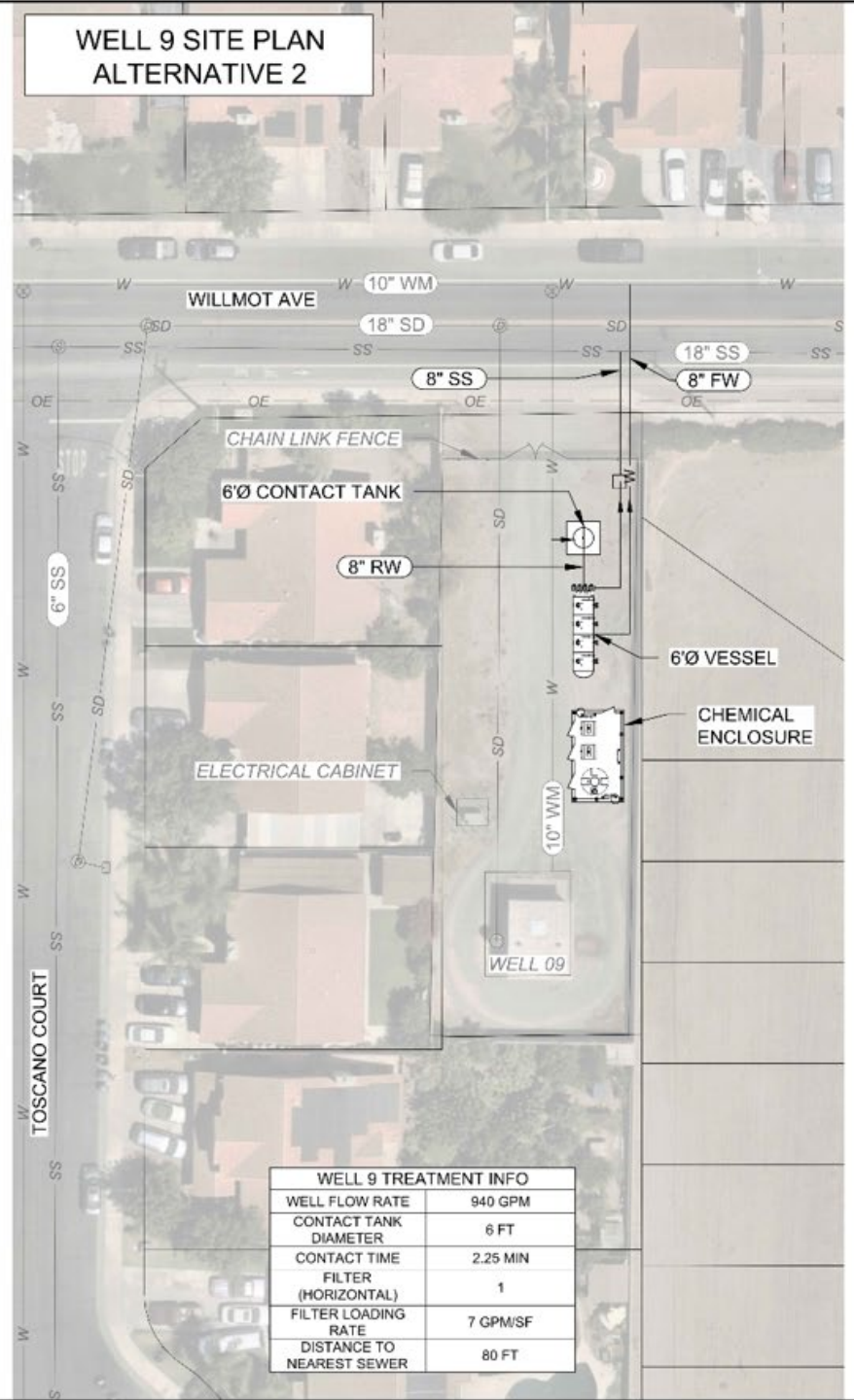
- ✓ Work through remaining issues identified in the pilot study.
- ✓ Determine what optional features the remaining treatment plants should include.
- ✓ Allow for operator training.
- ✓ Establish actual capital and operating costs.
- ✓ The actual costs will allow the City to more effectively apply for funding assistance.

WELL 9 SITE PLAN ALTERNATIVE 1



WELL 9 TREATMENT INFO	
WELL FLOW RATE	940 GPM
CONTACT TANKS	4
CONTACT TIME	2.7 MIN
FILTERS	12
FILTER LOADING RATE	6.23 GPM/SF
DISTANCE TO NEAREST SEWER	80 FT

WELL 9 SITE PLAN ALTERNATIVE 2



WELL 9 TREATMENT INFO	
WELL FLOW RATE	940 GPM
CONTACT TANK DIAMETER	6 FT
CONTACT TIME	2.25 MIN
FILTER (HORIZONTAL)	1
FILTER LOADING RATE	7 GPM/SF
DISTANCE TO NEAREST SEWER	80 FT

LEGEND	
—X—X—	REMOVE OR ABANDON
RW	RAW WATER
SS	SANITARY SEWER
FW	FINISHED WATER
WM	(E) WATER MAIN
SS	(E) SANITARY SEWER
SD	(E) STORM DRAIN

QUESTIONS?