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Compressible Media for Water Treatment

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Compressible Media for Water Treatment

CLSE 206 | **Team members:** Christine Forkins, Steven Kammermeier, Antonio Musso | **Faculty adviser:** Dr. B. Frank Gupton, Professor Rudy Krack, Dr. Bennett Ward | **Sponsor:** Suez | **Sponsor adviser:** Temple Ballard

Background

- Tertiary water treatment is used to remove Total Suspended Solids (TSS) and Turbidity from wastewater. Suez uses compressible media to filter for their tertiary water treatment.
- In order to achieve a capital and operational expenditure advantage, the medium compression is accomplished without a mechanical device.
- Supplier issues: Unreliable, long lead-time, unknown manufacturing process, and chance of resale.

Scope

Understand the design and performance of existing compressible media on the market.



Original patented comet media



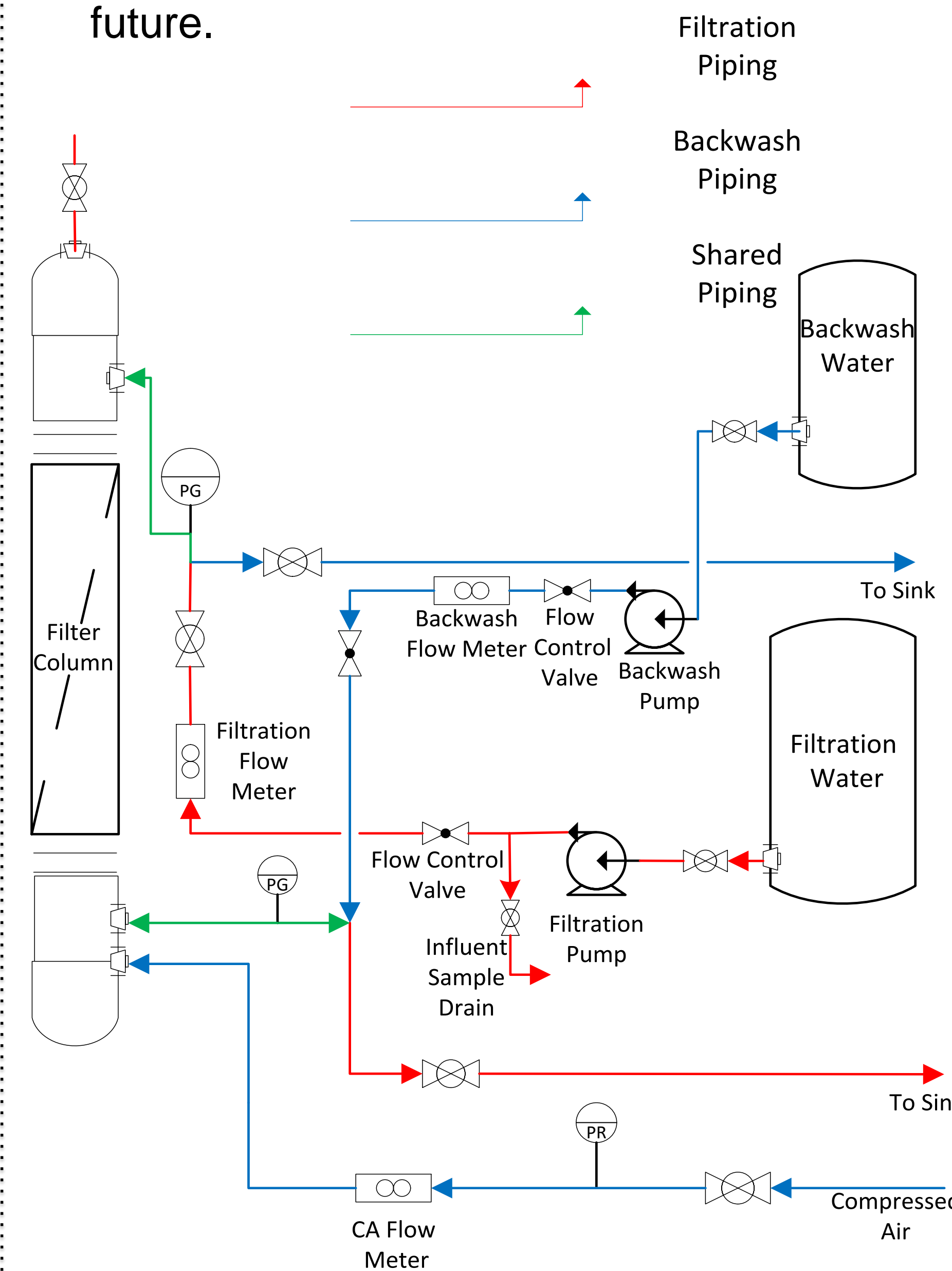
Media generated to mimic comet media

Deliverables

- Characterize different types of existing media.
- Design a small scale filtration unit.
- Design and manufacture new media for testing.

Design

- A 3" diameter filtration unit to mimic the existing unit.
- A lab method to manufacture a media that imitates the current media used.
- A new media type to be manufactured in the future.



- Seed-pod type media design.
- Denier: 4.2 DPF.
- Design is new to the market.

Testing Process

- Characterize existing media (fiber material, node material, length, node diameter, node location, fiber denier).
- Perform filtration and backwash testing on the available media at water concentrations of 10, 30, and 50 mg TSS/L (determine influent and effluent turbidity and TSS).

Results

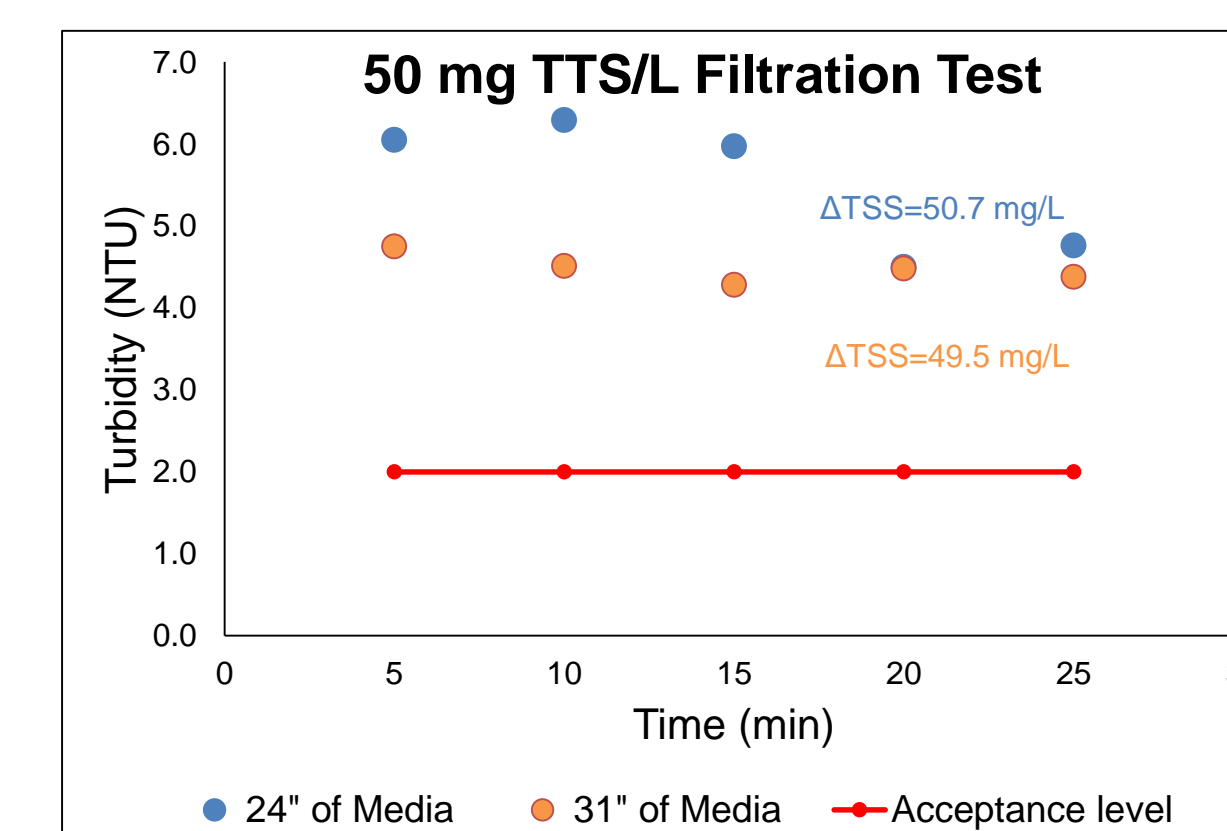
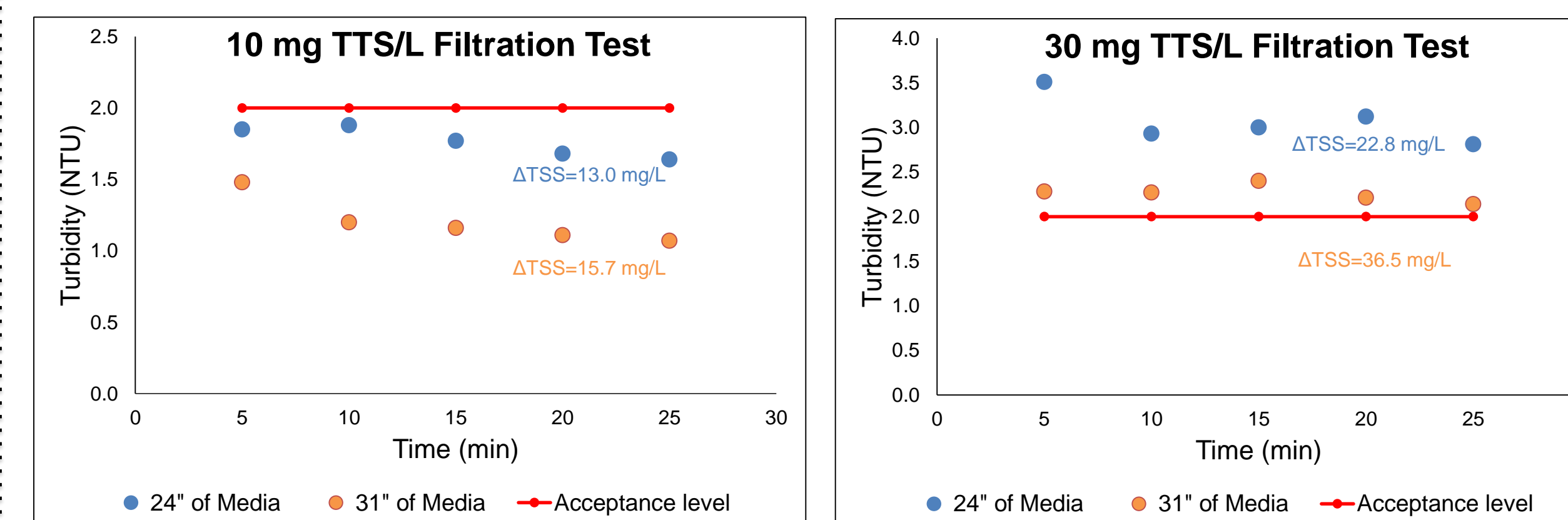
Original Comet Media

- **Fiber Composition:** Polyethylene terephthalate
- **Node Composition:** Atactic polystyrene
- **Denier:** 11.8 DPF

Sample	Media Length (in)	Bead Location (in)	Diameter (in)
Comet Media	1.50	0.83	0.16
Mimic Media	1.58	0.82	0.17

Mimic Comet Media

- **Raw Material Cost:** \$4.07/kg of media



- Due to the channeling and Wall-effects, acceptable effluent TSS levels were not reached.
- Channeling caused solid breakthrough.
- Complications during TSS testing lead to questionable results.
- Filtration control was difficult without automation.

Future Plans

- Manufacture and test the newly designed media.
- Setup the testing apparatus at IDEAS.
- Evaluate a larger diameter column to minimize wall effects.

Acknowledgments

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