Honolulu Board of Water Supply's Emerging Contaminant Management Program

October 16, 2025

Uncertainty in PFAS regulations due to legal challenges and shift in EPA priorities

Current regulations

Enforced 2029

Compound	MCL
PFOA	4.0 ppt
PFOS	4.0 ppt
PFHxS	10 ppt
PFNA	10 ppt
HFPO-DA (GenX)	10 ppt
PFBS	Hazard Index

Planned (EPA announcement)

Enforced 2031

Compound	MCL
PFOA	4.0 ppt
PFOS	4.0 ppt

Agenda

1. Program Objectives and Scope
2. Emergency Treatment
3. GAC Designs
4. Pilot Testing
5. Next Steps

Project Objectives and Scope

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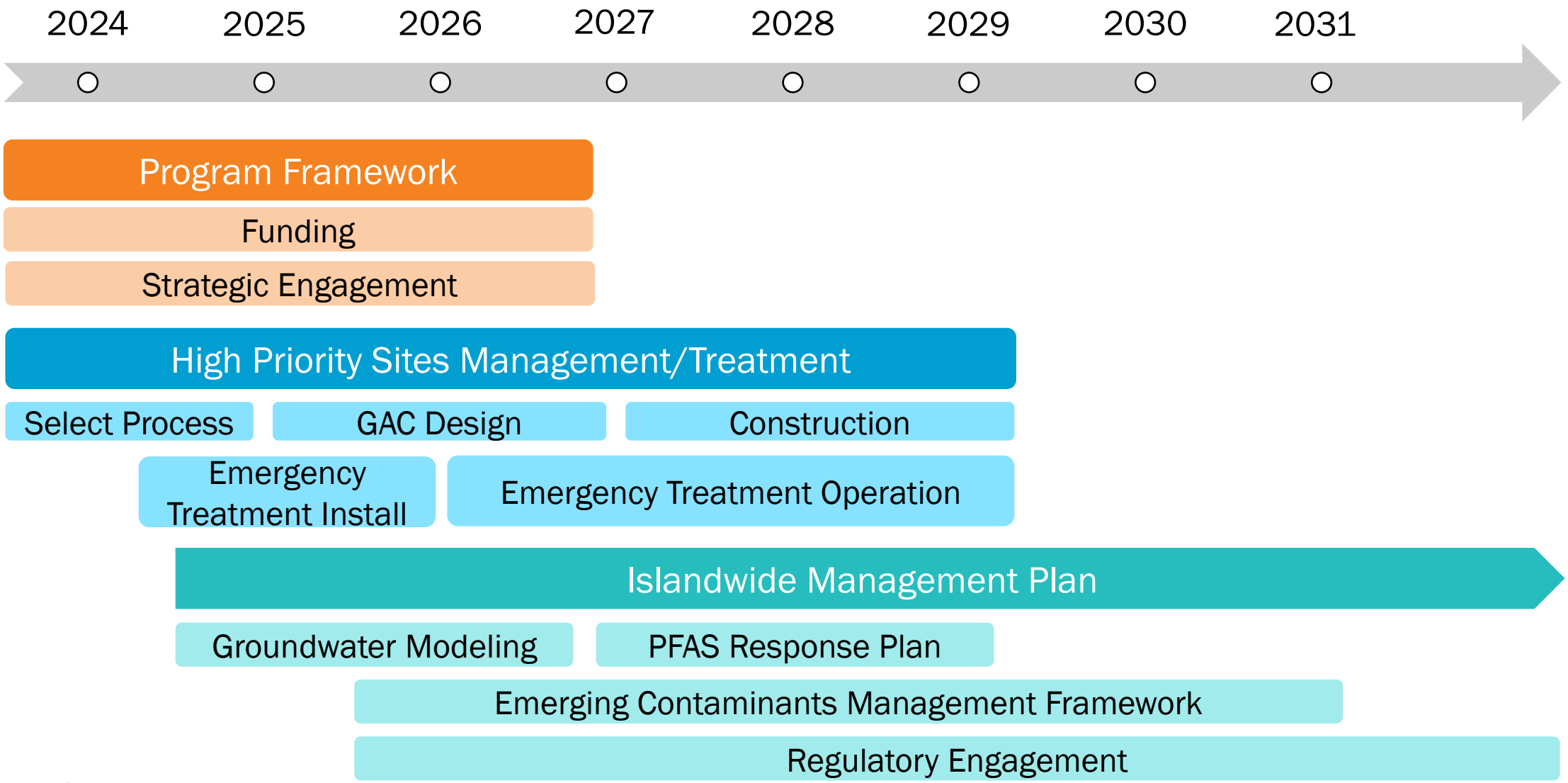
BWS PFAS Detections

- Almost all below the new MCL - some are sporadic
- Others at just barely at the new MCL
- Some sites have GAC treatment facilities

Stewards and Protectors

- Where is the PFAS coming from?
- Where should we be concerned about for the future?

Scope Overview



Goals & Success Factors

WATER QUALITY
- Achieve contaminant limit goals
- Consistent monitoring
- Coordinated response/data

COLLABORATIVE PARTNERSHIPS
- Proactive partnerships
- Coordination of data/sources and response
- Stick to the facts

WATER RELIABILITY
- Define baseline system characteristics
- Emergency preparedness + responsiveness
- Adaptive system management

PUBLIC TRUST
- Consistent messaging
- Response triggers
- Non-alarming information/transparency
- Supported response approach

Emergency Treatment

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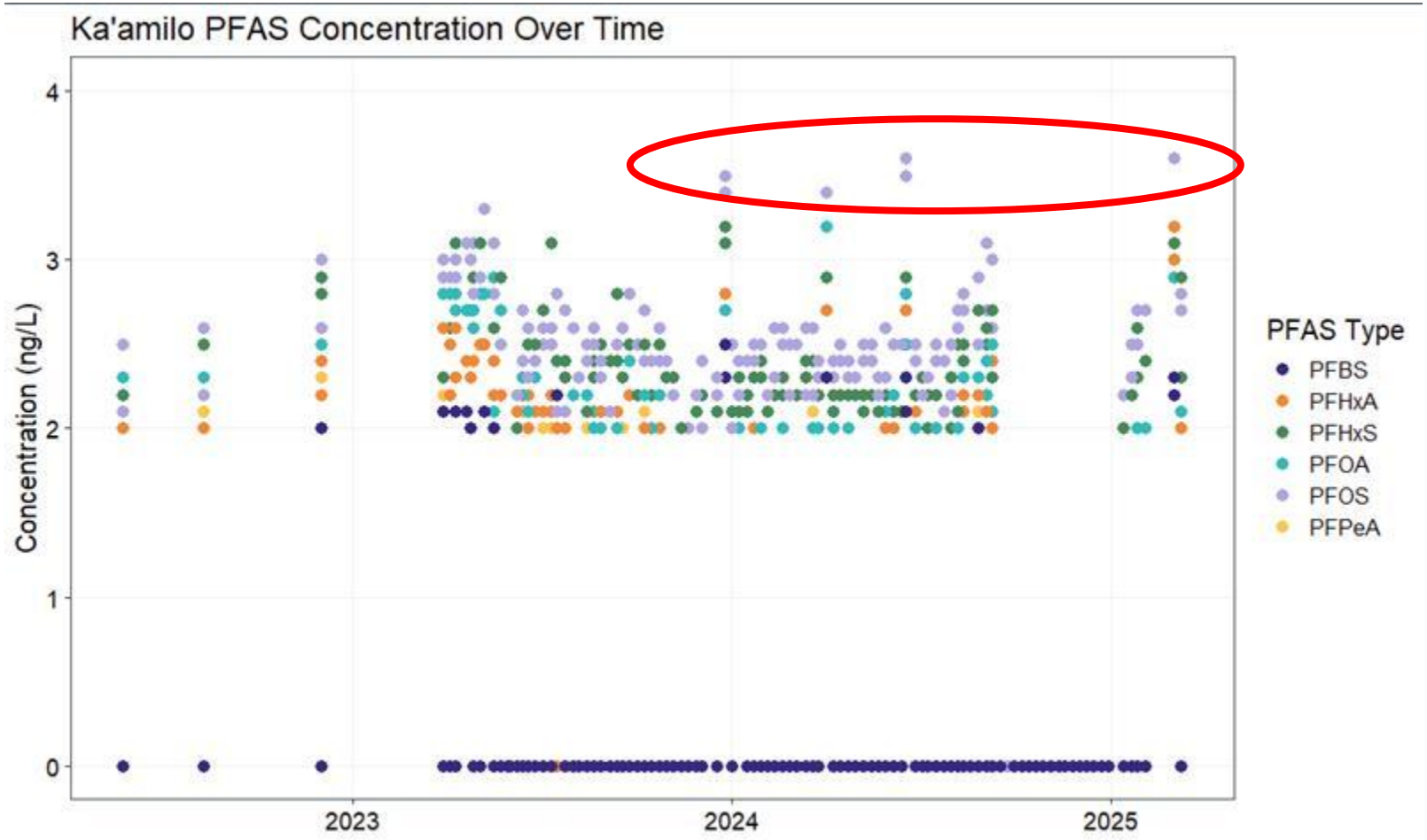
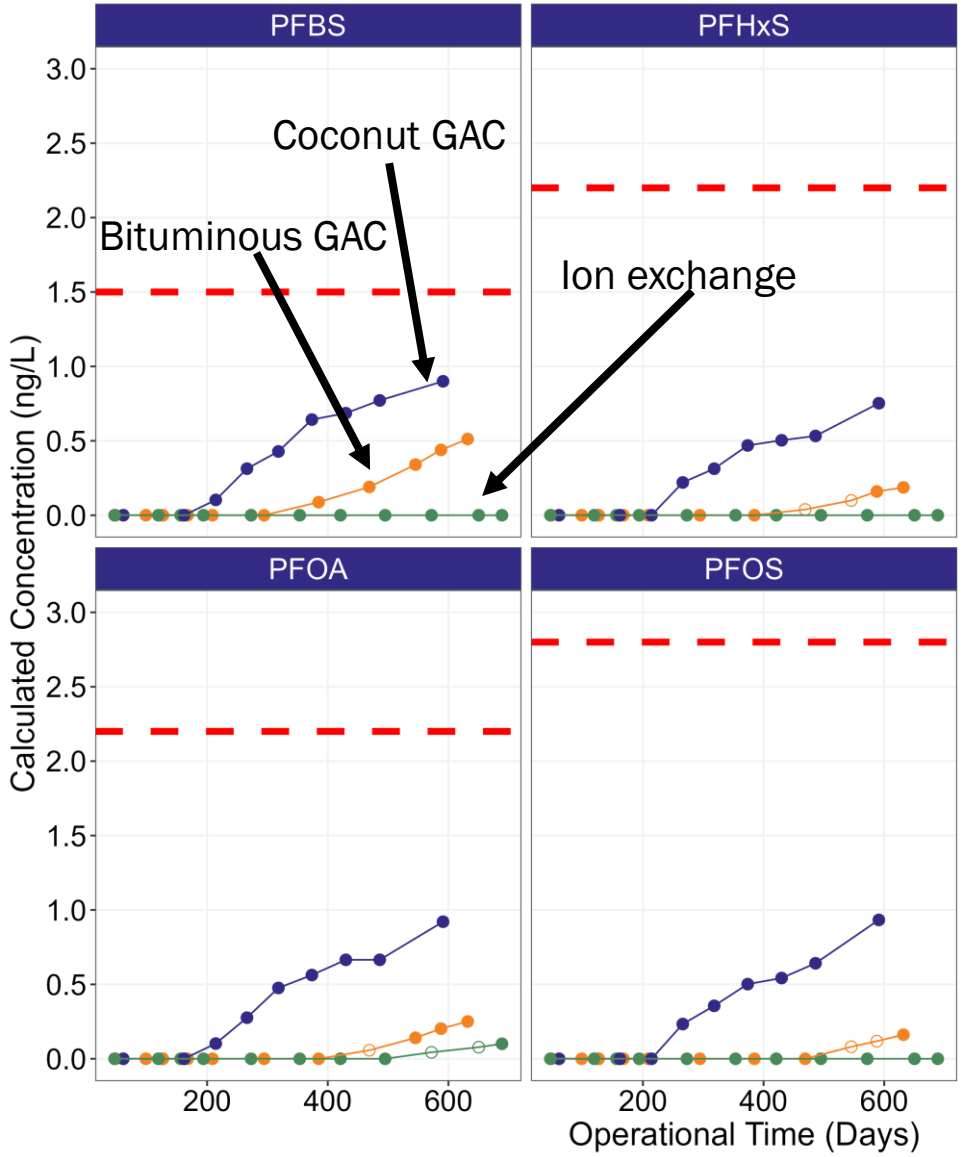
PFAS concentrations at Ka’amilo Wells are nearing the future MCL



Bench-scale testing informed treatment selection

- Rapid small-scale column tests (RSSCTs) run on Ka'amilo water
- Granular activated carbon (GAC) and ion exchange could both run for at least several months
- GAC selected for ease of operations

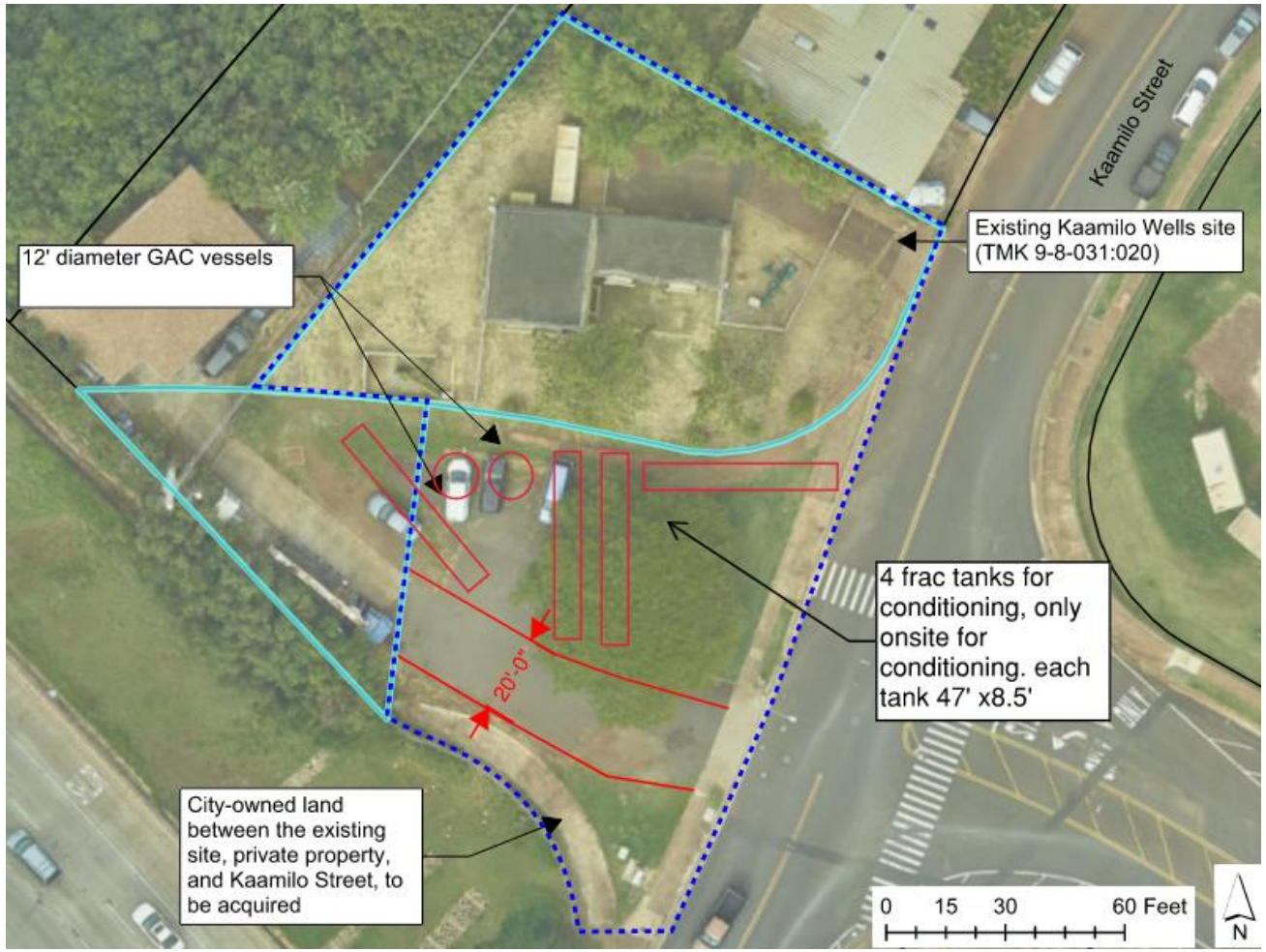


Emergency treatment challenges

- Site constraints
  - Physical size
  - Use of neighboring site
- Schedule
- Waste water from media preparation
  - Backwash: remove fines, stratify bed
  - Forward flush: stabilize pH, remove arsenic

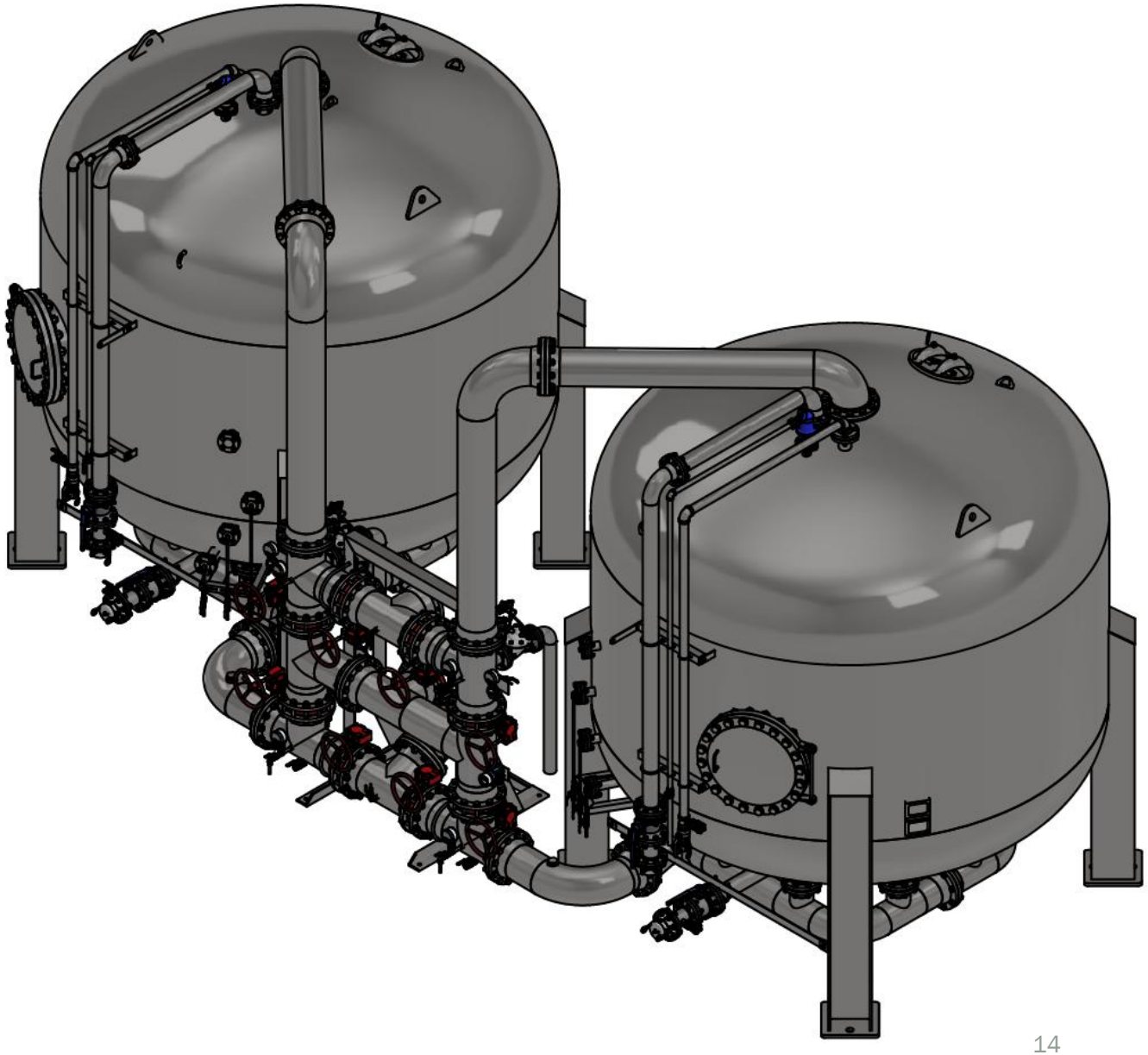
Temporary Treatment System

- Installed/maintained by Clean Harbors
- BWS responsible for regulatory compliance
- (2) GAC vessels operating lead-lag with 5-min EBCT each
- Frac tanks to transport waste water to existing GAC site for processing
  - Considered skid-mounted GAC, but too heavy to transport after media is wet



Next Steps

- Submit report to DOH and get approval
- Finish installation
- Operate until permanent system is built



Permanent GAC Designs

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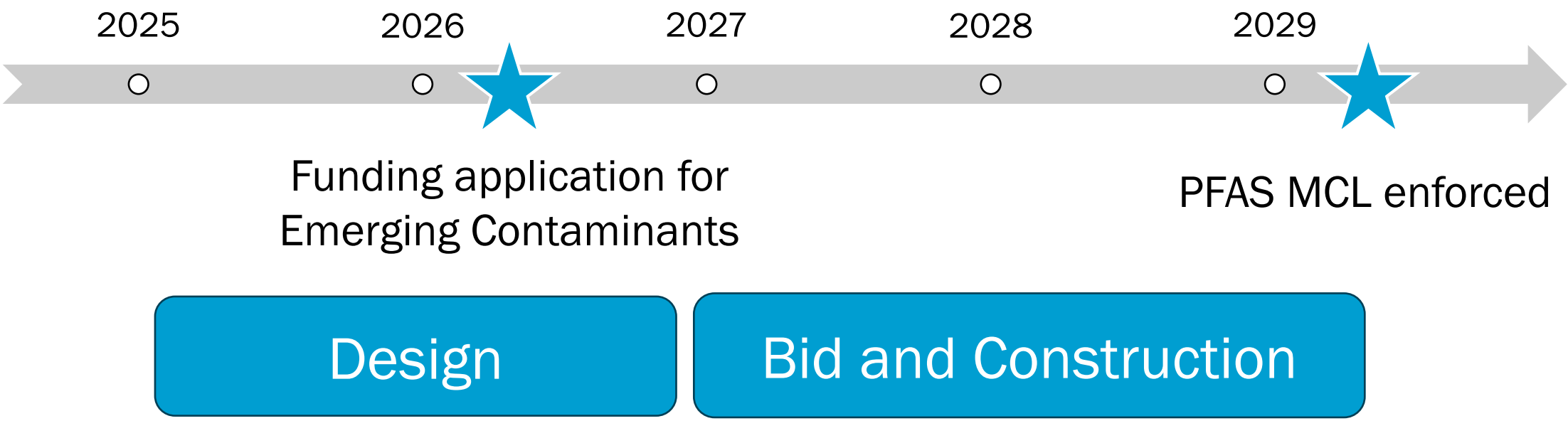
Three sites selected for treatment

- No existing treatment
- Regulated PFAS detected
- High importance to system capacity

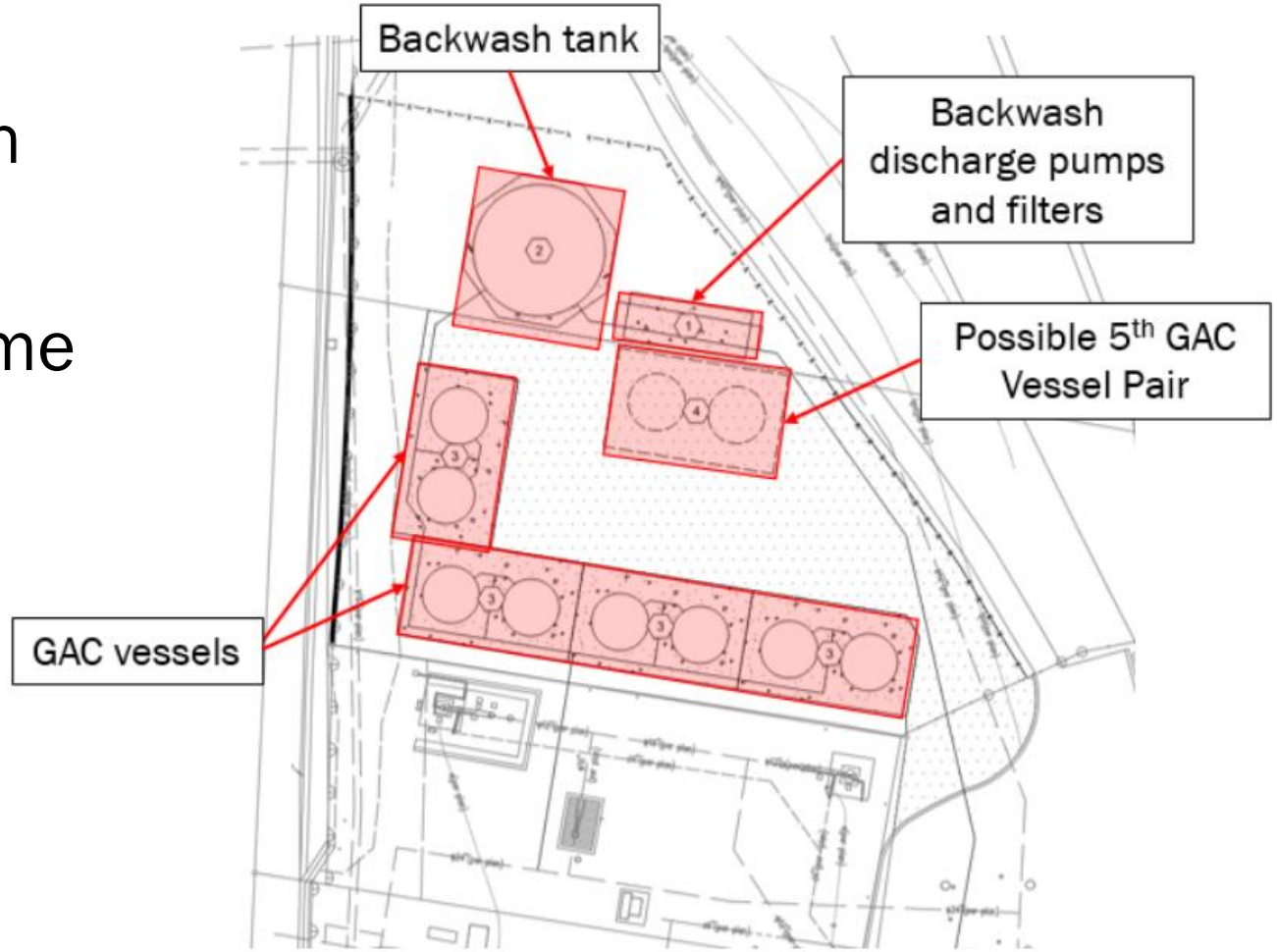
Treatment at: Ka'amilo, Moanalua, Pearl City Shaft

Design and construction timeline are driven by funding and regulatory timeline



Design Criteria

- Single pass or lead-lag operation
- GAC or ion exchange media
- 10-minute empty bed contact time (EBCT) verified with bench-scale testing (RSSCTs)



Pilot Testing

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Treatment Evaluation "Toolbox"

Tool	Advantages	Disadvantages	Primary Use
Full-scale sampling	• Use existing treatment systems • Good performance estimates	• Requires treatment system with similar raw water quality and design	• Ground truth other results
Modeling	• Efficient and scalable • Fastest results/lowest cost	• Least accurate estimates • Can't model every parameter	• Compare a lot of scenarios • Translate testing results to other sites/scenarios
Bench-Scale Testing	• Fast results/low cost • High control of variables	• Scale-up is imperfect	• "Will it work?" • Inform design criteria
Pilot-Scale Testing	• Most accurate estimates • Parallels real operations	• Slower results/higher cost • Less control of variables	• Operational predictions and guidance

Bench-scale vs pilot-scale testing

Bench-Scale

Rapid Small-Scale Column Tests (RSSCTs)

- 0.5 cm columns with ground media
- Scaled down flow rate and bed depth
- Conducted in the laboratory
- Low cost, complete quickly

Pilot-Scale

- 4-6” diameter columns
- Run at the same conditions as full scale
- Conducted on site
- Higher cost, longer runs

Pilot test plan development considerations

Test Matrix

- Test conditions that can't be evaluated at bench (intermittent shutdown, variable flow)
- Measure operational parameters (head loss)

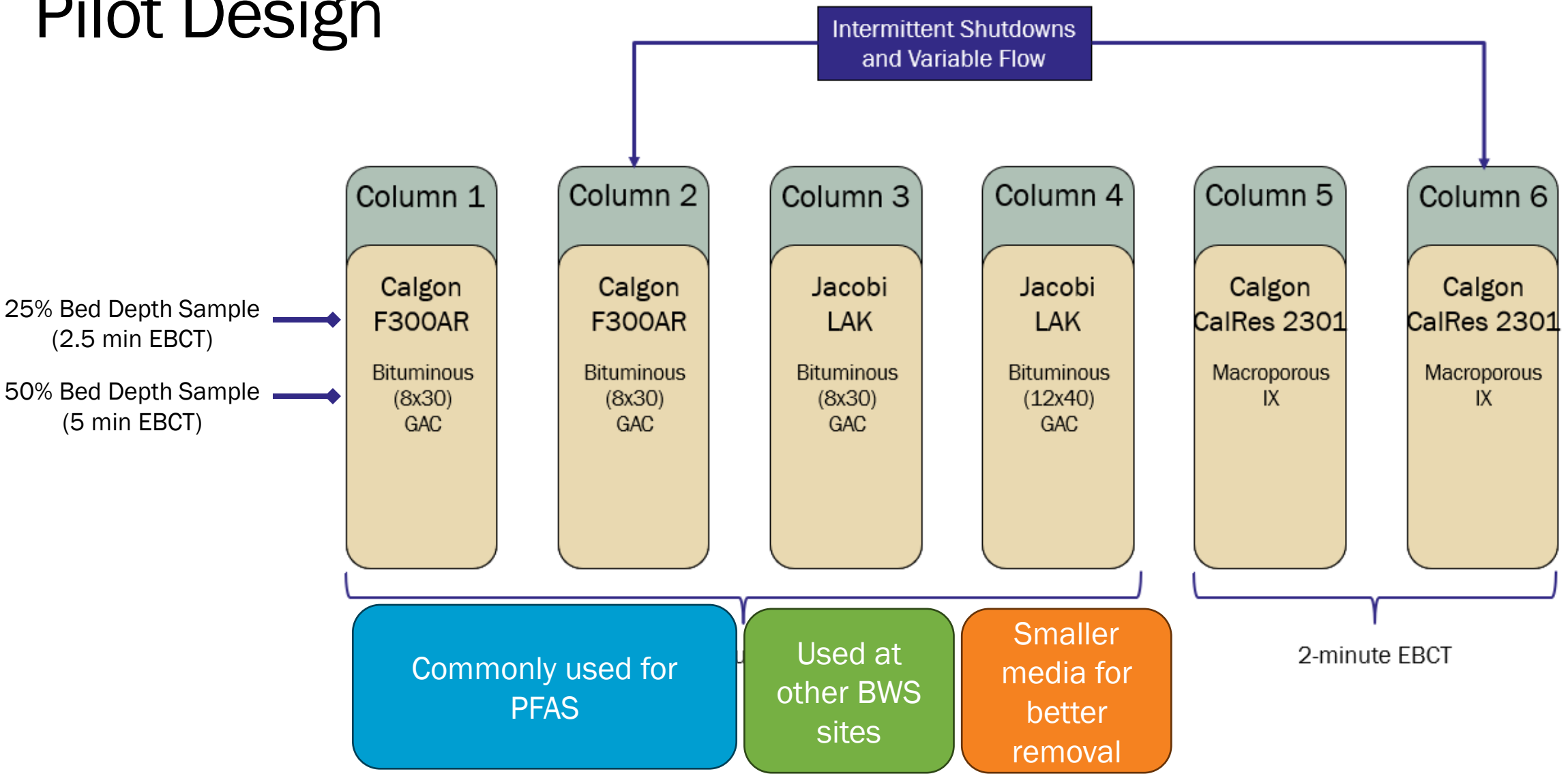
Site Selection

- Most challenging water quality for "worst case" treatment
- Well must operate continuously for 18 months

Analytical Sampling

- Large portion of total cost
- Sampling frequency and analytes selected to capture key data points

Pilot Design



Pilot at Ho'ae'ae Wells

Pilot findings so far

- Operational challenge: Algae growth
  - Biological growth despite low organics
  - Possible issue for ion exchange
- Good performance for regulated PFAS
- Differences between different types and sizes of GAC media
- 5-minute EBCT still shows removal

Next Steps

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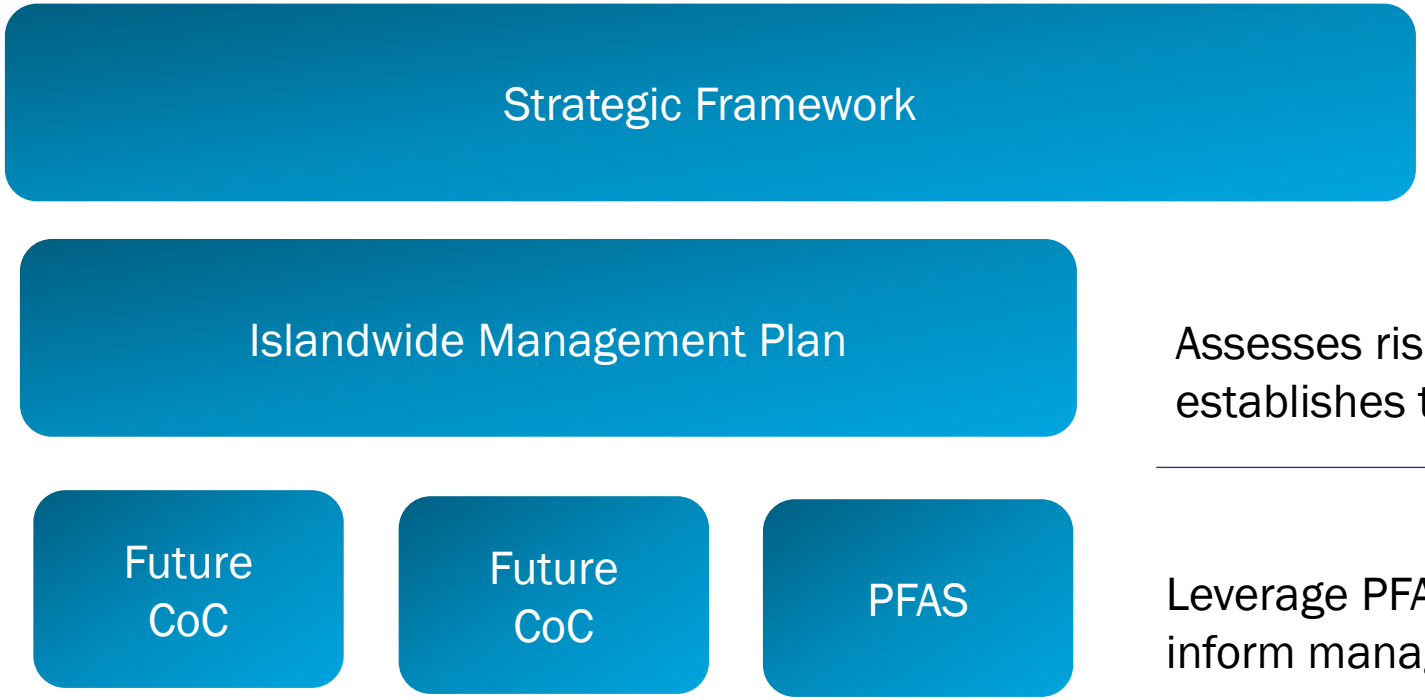
High priority sites

- Ongoing GAC design (3 sites)
- Funding application for construction
- Ongoing pilot testing
- Estimate treatment performance and cost for remaining sites with existing PFAS

Islandwide Management Plan will document approach for future emerging contaminants with PFAS as template

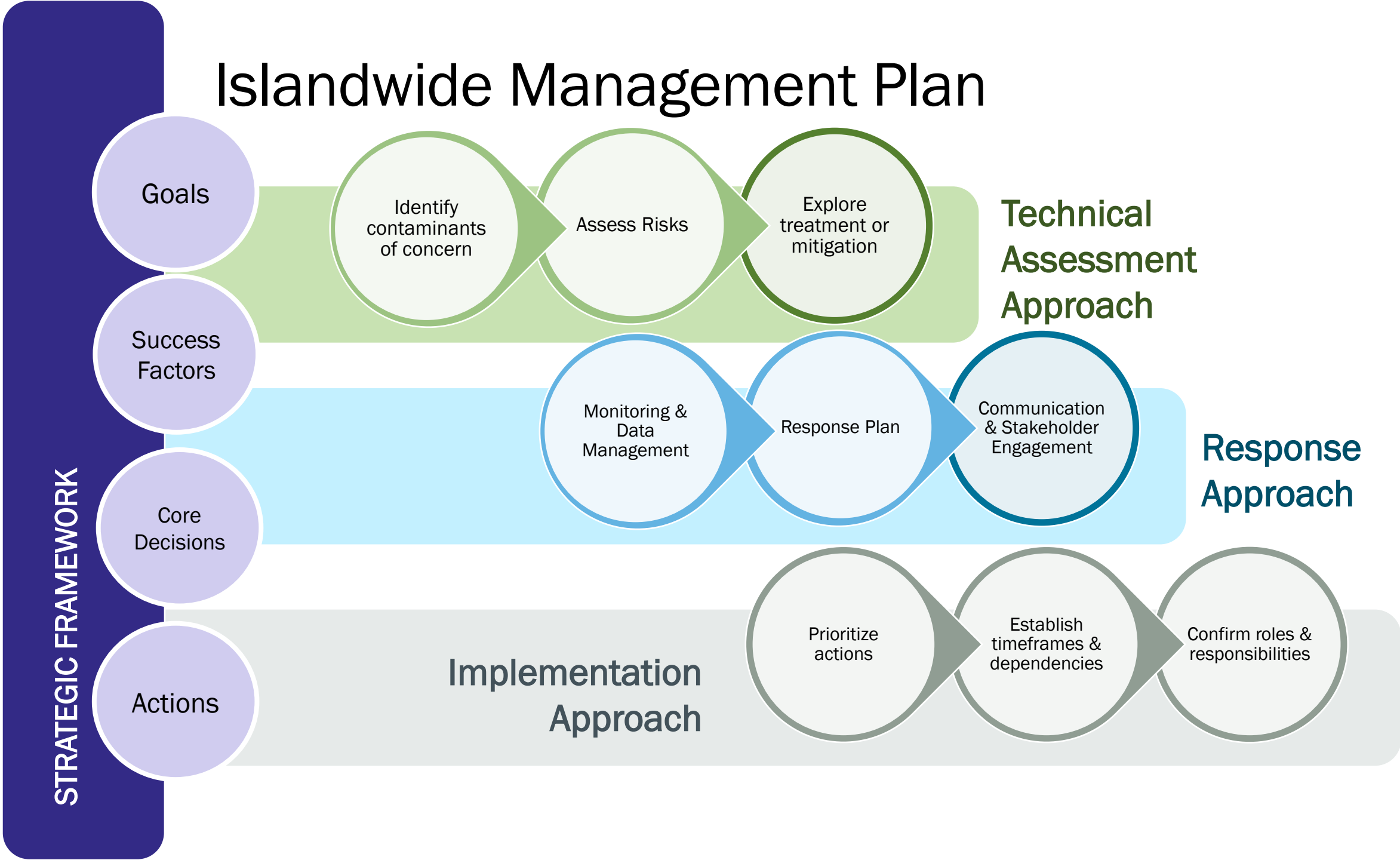


Establishes program goals, objectives and success factors, serves as strategic decision-making tool

Assesses risk, defines actions, establishes triggers for evaluation

Leverage PFAS as a template to inform management plan approach

Islandwide Management Plan



Thank you.

Questions?

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