AQUA-AEROBIC SYSTEMS, INC.
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AI Working Group

Status Update

July 2025

Outline

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- Objectives for AI at Aqua
- Testing and lessons learned to date
- Plan forward

Initial Test Team

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- Sarah Gamble (Contract Admin)
- Zach Dal Pra (Cost Estimating)
- Kayla Stevens (Applications Engineering)
- Nick Schroeder (IT)
- Joe Tardio (Sales & Marketing)

Major Benefits of AI at Aqua

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1. Gain business efficiencies and/or quality improvements in task-related outputs
2. Free-up human capital for other higher value-added areas
3. Maintain competitive edge in industry
4. Personnel development
5. Continuous improvement

Overall Objectives for AI Implementation at AASI

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- Best practices
- Training people to interact with the models efficiently and effectively
- Understand potential pitfalls
- Identify initial focus areas
- Develop an implementation and testing plan and schedule
- Institute a continuous improvement plan
    - Adoption in other business areas
    - Continue to become more effective and efficient in utilization of AI tools

Perceived Concerns from Users

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1. AI will create redundancy in their role
2. AI will deteriorate their output in terms of efficiency, quality, accuracy, etc.
3. AI will be too difficult to learn and implement
4. AI is too time consuming to "add" to existing tasks

→ ***Using and becoming comfortable with AI is the only way to address these perceived issues***

Steps Taken To Date

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- Initial Revere Meeting – Nov 2024
- Working Group formed and meeting regularly
- Implementation plan identified
- Initial focus areas identified
- Initial AI model and app platform identified
- New IT tools developed
- Prompt and questionnaire development and testing
- Accuracy/efficiency testing and continuous refinement

Initial Focus Areas

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- Seek low-hanging fruit:
  - Business impact
  - likelihood of success

→ Cost Estimating – Spec Review

→ Contract Admin – Contract T&Cs review

$$\text{WSJF} = \frac{\text{User-Business Value} + \text{Time Criticality} + \text{Risk Reduction or Opportunity Enablement}}{\text{Job Size or Effort}}$$

- Most AI initiatives fail because of failure in selecting the right projects
- ***AI project is 15% tech, 85% people***

Poe App – Web-based Platform

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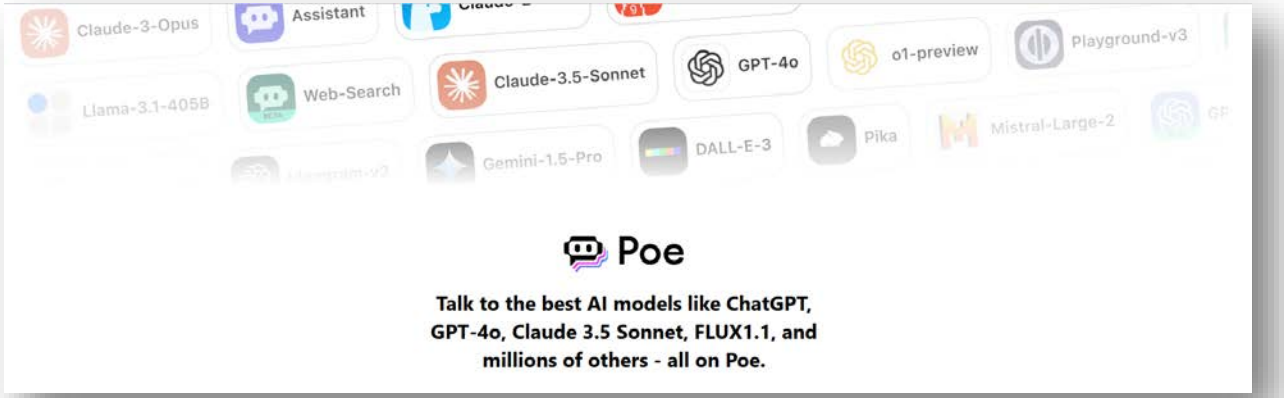
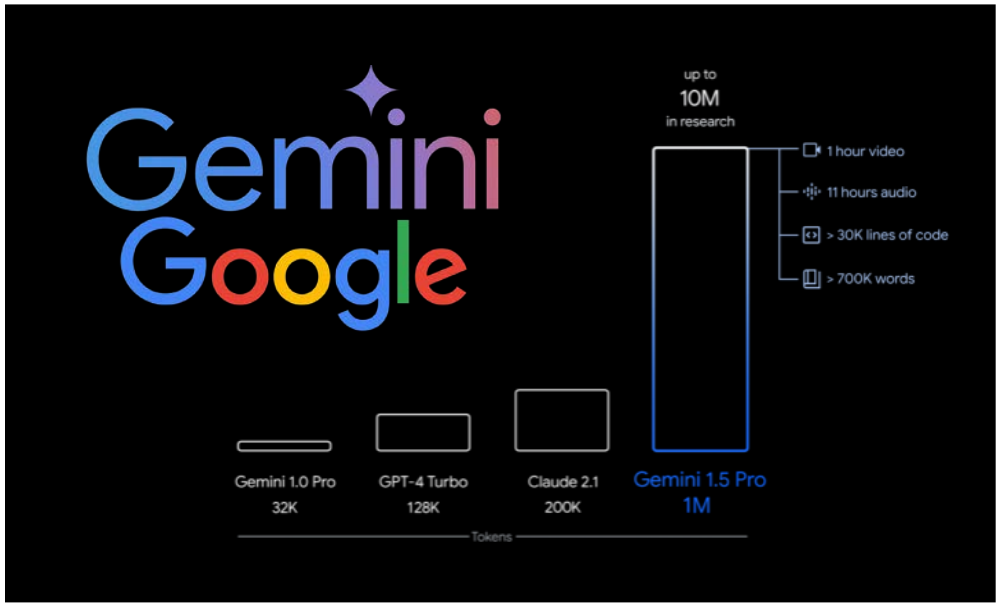
- Access to many different AI for same monthly fee
- Each AI has its strengths and weaknesses
- Models evolving rapidly



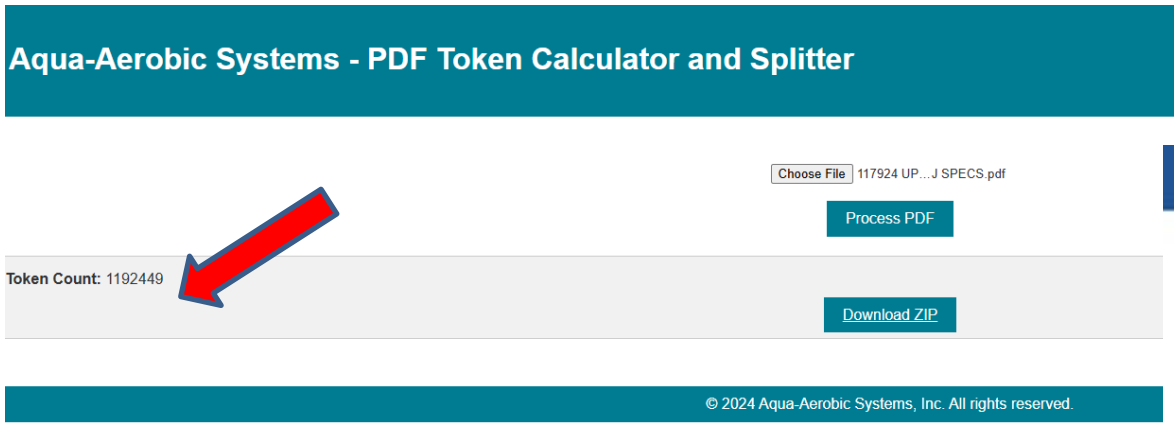
- Context window = # tokens a model can process in a **single interaction**
- Gemini 1.5 Flash **1M**

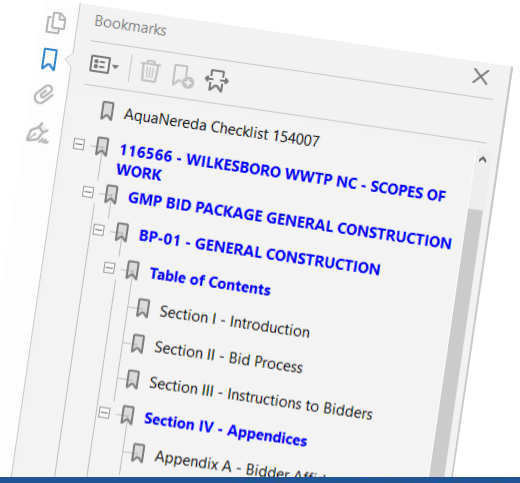


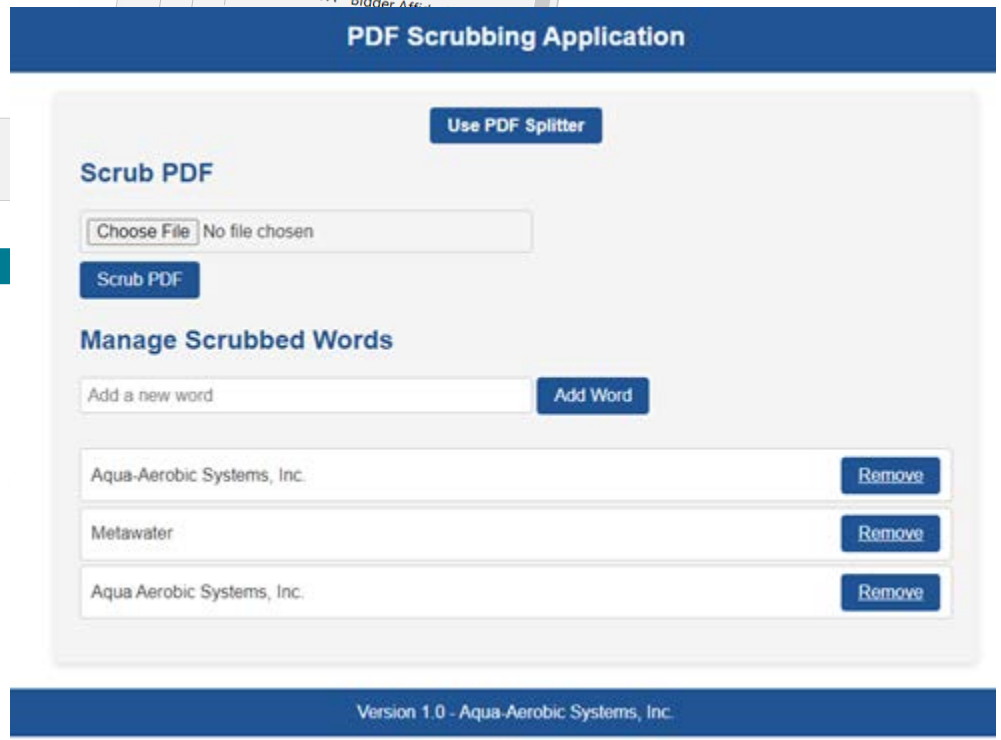
Context lengths of leading foundation models

IT Tools

- https://aquaai.app/
- Token Calculator / PDF Splitter (released)







- Auto Bookmarker
- Scrubber

Prompting and Questionnaires

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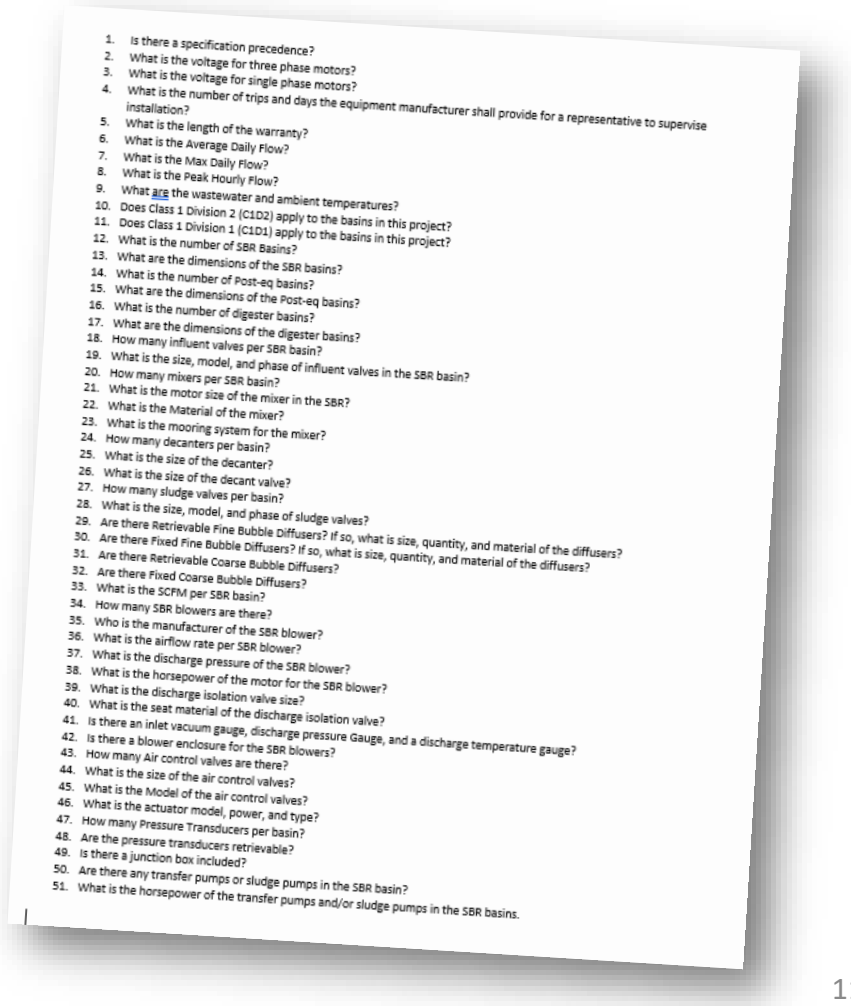
Prompts

- **Training people to use effective prompts is critical**
- "Start fresh" – old query chains can skew output by perpetuating bias
- Training is in the user, not the model
- Trial and error – define a standard

Questionnaires

- Frame the required output
- Developing robust context-based questionnaires to query AI is critical
  - Subject matter experts for each group
  - Living documents that are maintained and refined over time to become very reliable

Example CE questionnaire for SBR spec review



1. Is there a specification precedence?
2. What is the voltage for three phase motors?
3. What is the voltage for single phase motors?
4. What is the number of trips and days the equipment manufacturer shall provide for a representative to supervise installation?
5. What is the length of the warranty?
6. What is the Average Daily Flow?
7. What is the Max Daily Flow?
8. What is the Peak Hourly Flow?
9. What are the wastewater and ambient temperatures?
10. Does Class 1 Division 2 (C1D2) apply to the basins in this project?
11. Does Class 1 Division 1 (C1D1) apply to the basins in this project?
12. What is the number of SBR Basins?
13. What are the dimensions of the SBR basins?
14. What is the number of Post-eq basins?
15. What are the dimensions of the Post-eq basins?
16. What is the number of digester basins?
17. What are the dimensions of the digester basins?
18. How many influent valves per SBR basin?
19. What is the size, model, and phase of influent valves in the SBR basin?
20. How many mixers per SBR basin?
21. What is the motor size of the mixer in the SBR?
22. What is the Material of the mixer?
23. What is the mooring system for the mixer?
24. How many decanters per basin?
25. What is the size of the decanter?
26. What is the size of the decant valve?
27. How many sludge valves per basin?
28. What is the size, model, and phase of sludge valves?
29. Are there Retrievable Fine Bubble Diffusers? If so, what is size, quantity, and material of the diffusers?
30. Are there Fixed Fine Bubble Diffusers? If so, what is size, quantity, and material of the diffusers?
31. Are there Retrievable Coarse Bubble Diffusers?
32. Are there Fixed Coarse Bubble Diffusers?
33. What is the SCFM per SBR basin?
34. How many SBR blowers are there?
35. Who is the manufacturer of the SBR blower?
36. What is the airflow rate per SBR blower?
37. What is the discharge pressure of the SBR blower?
38. What is the horsepower of the motor for the SBR blower?
39. What is the discharge isolation valve size?
40. What is the seat material of the discharge isolation valve?
41. Is there an inlet vacuum gauge, discharge pressure Gauge, and a discharge temperature gauge?
42. Is there a blower enclosure for the SBR blowers?
43. How many Air control valves are there?
44. What is the size of the air control valves?
45. What is the Model of the air control valves?
46. What is the actuator model, power, and type?
47. How many Pressure Transducers per basin?
48. Are the pressure transducers retrievable?
49. Is there a junction box included?
50. Are there any transfer pumps or sludge pumps in the SBR basin?
51. What is the horsepower of the transfer pumps and/or sludge pumps in the SBR basins.

Confidentiality and Copyright Protection

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- Best practice is to scrub docs of sensitive info.
- Generally speaking, AI output is not copyright protected as it is computed by a generative model, therefore should be "original".
  - Many universities and companies now allow it with proper citing
- Regulations and legal analysis is evolving rapidly; may change in future
- Enterprise AI versions have ability to create "closed" networks, but lose access to the global database (and costs more $)

Accuracy Testing

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- How to trust and test the model?
- Key part of implementation
- Benchmark AI result vs human effectiveness
  - ***humans are not 100%***
- Accuracy vs efficiency – how accurate does it need to be?
  - Depends on focus area and associated risk vs efficiencies gained

Future Areas of Implementation

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- Already seeing AI being used by engineers, contractors, peer companies, etc.
- Many opportunities – we are just scratching the surface

Revere – Potential AI uses across all business areas

Name	Phase/ Dept
Contract Evaluation	Estimating
Specification Evaluation - Hardware recommendations 2nd gen	Estimating
Sage produces the pdf cutouts, of specs. of customer specs. with comments,	Estimating
Estimating Schedule Completion	PM
Historical Change order indexing	PM
Forecasting job performance using based of prior perfomance in Spectrum/GP Swing	
Automated Invoicing	Estimating, PM
Symbol recognition and classification from P&ID diagrams	Engineering
Symbol recognition and classification from One-line diagrams	
O&M manuals. Automatically generating a manual out of BOMs	
Indexing drawing archive. The Go-by.	CAD, Engineering, Estimating
Pruchasing and Inventory control	Panel Manufacturing
UL 508 bot to assist in panel shop	Panel Manufacturing
NEC bot (i.e Wire, breaker sizing)	Panel Manufacturing
PLC Code Generation	PLC Scada
Migrating program. PLC and SCADA infrastructure, live values	PLC Scada
Adaptive Loop tunning	Site Services
AR tool taking a visual record and archiving service calls	Site Services
Chat bot for Field service, enginieering, production	Site Services
HR recruiting tool. Pair the job description with the resume of successful current employees	
~~Find patterns in Spectrum data to gain insight into loosing and winning jobs~~	HR
HVAC management	
Cyber security using AI	
Disaster recovery	
Open chatgpt to shop and personnel to just use it.	
Soho data - Find patterns to determine good estimation vs bad estimation	

"Ideal" use cases

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- Frequent, routine and/or repetitive tasks (not project specific)
- Inputs are generally consistent and in usable format
- Not business-critical
- Not confidential
- Generates repeatable output
- Provides for gains in efficiency and/or confidence in result

Key Takeaways (Thus Far)

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- Individual users are in the best position to determine use and methods
- Learn to effectively interact with AI model and optimize prompts and questionnaires
- Mindset of "assistant" vs "replacement"
- Using AI as a screening tool to enhance checks and make detailed analysis more efficient
- Focus on "quick wins" instead of large, complex tasks
- Continue to identify other frequent and repetitive tasks that are good candidates for AI assistance

Focus Areas & Progress To Date

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Contract Admin	Cost Estimating	Applications Engineering	Sales Correspondent
• T&C Review • Commercial Bid Summaries • HOM prep	• Spec review	• Bench scale/pilot report streamlining	• Shared review bookmarking

Moving forward

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- Request Poe access
- Each “tester” will use at their own pace and will prepare a short summary every 1-2 months
- Help each other!