Reducing Chemical Demand and Preserving Treated Produced Water Quality Using Advanced Aeration in the Permian Basin

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Xedia Process Solutions (XPS)

XPS develops and applies innovative water treatment technologies to the Oil & Gas and Industrial sectors

DROP-IN REPLACEMENTS: CARTRIDGES & BULK MEDIA

FULLY INTEGRATED TREATMENT SYSTEMS

UNCONVENTIONAL WATER TREATMENT

DIAGNOSIS, COMISSIONING & FIELD SERVICES

WHERE WE OPERATE

OUR APPROACH

We focus on creating Practical, Effective, & Economical Solution to the Energy and Industrial Sectors' most challenging waste water applications.

OUR TECHNOLOGY

XOP Patented Oil Polishing Media

XDN Patent-pending Modified Nutshell Media

XTB Microporous Oil/TSS Removal Media

**Under Development*

Aeromax Patented Aeration Systems

TREATING THE WORLD'S TOUGHEST WASTE WATERS JUST GOT EASIER.

Xedia

Process Solutions

Aeromax Advanced Aeration

What is Aeromax?

- Patented, venturi-style aeration system
- Optimized for maximum oxygen dissolution while continuously circulating water
- Powered by submersible or external water pump, not an air compressor

Aeromax Aeration Head

Submersible Pump Configuration

External Pump Configuration

Introduction – Aeromax Advanced Aeration

Why Aerate?

Produced Water Recycling

Iron (Fe)

Solids Separation

Oil/Water Separation

Installations

Produced Water Ponds

Fresh Water Ponds

Frac Tanks

ASTs

Water Quality Maintenance

H2S

Algae

Anaerobic Bacteria

Key Aeromax Performance Benefits

Rapid increase in Dissolved Oxygen (DO)

Efficient circulation of full water volume

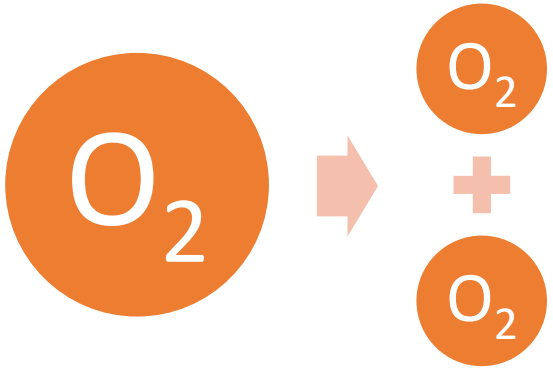
Accommodates in situ chemical injection

High efficiency mixing and dispersing of chemicals

Technology – Bubble Size Efficiency

- The Aeromax technology entrains a range of bubble sizes while supersaturating the pumped water
  - Bubble size is adjustable based on application goals

- Smaller bubbles = high surface area for gas transfer
  - Maximizes gas transfer between air and water (O2 dissolution)
  - Very slow rise rate, maximizing allowable time for gas transfer

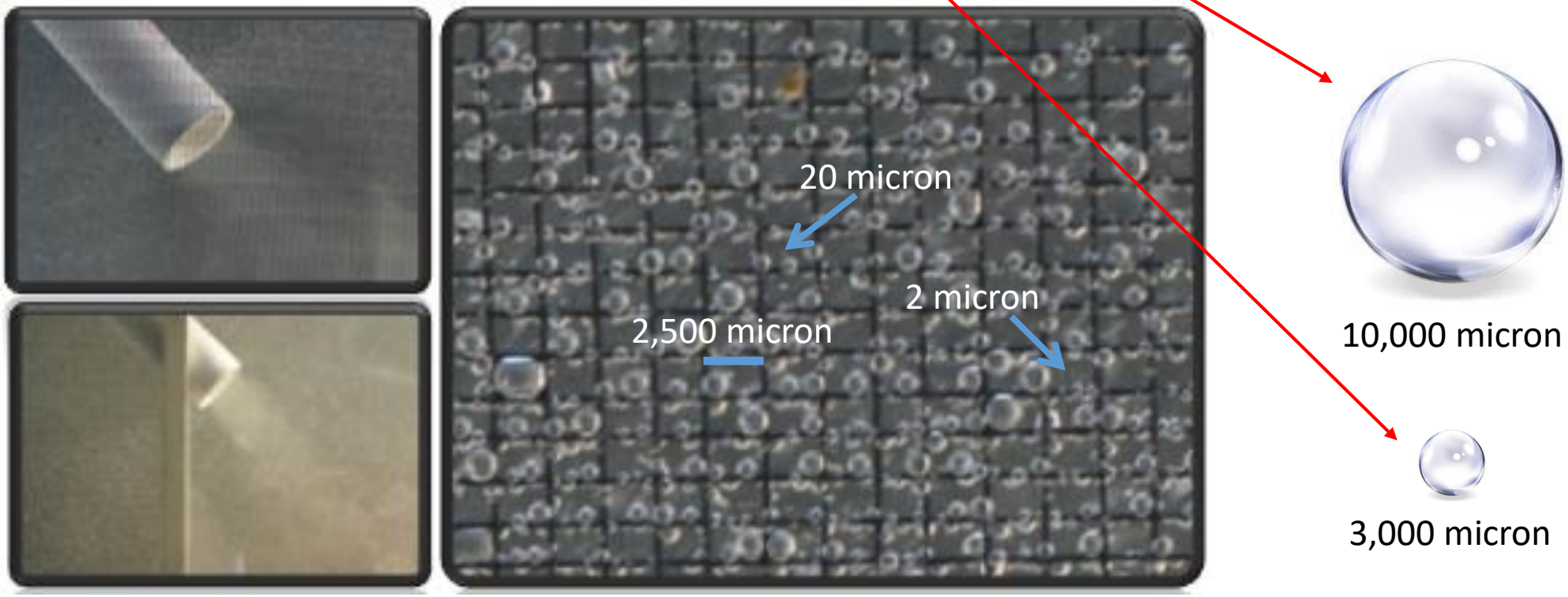


- Larger bubbles = higher rise rate
  - For PW Treatment – Enhances flotation and separation of oil from water
  - For Quality Maintenance – Enhances vertical turnover and oxygen distribution

Technology – Bubble Size Efficiency

Technology Comparison – Bubble Sizes

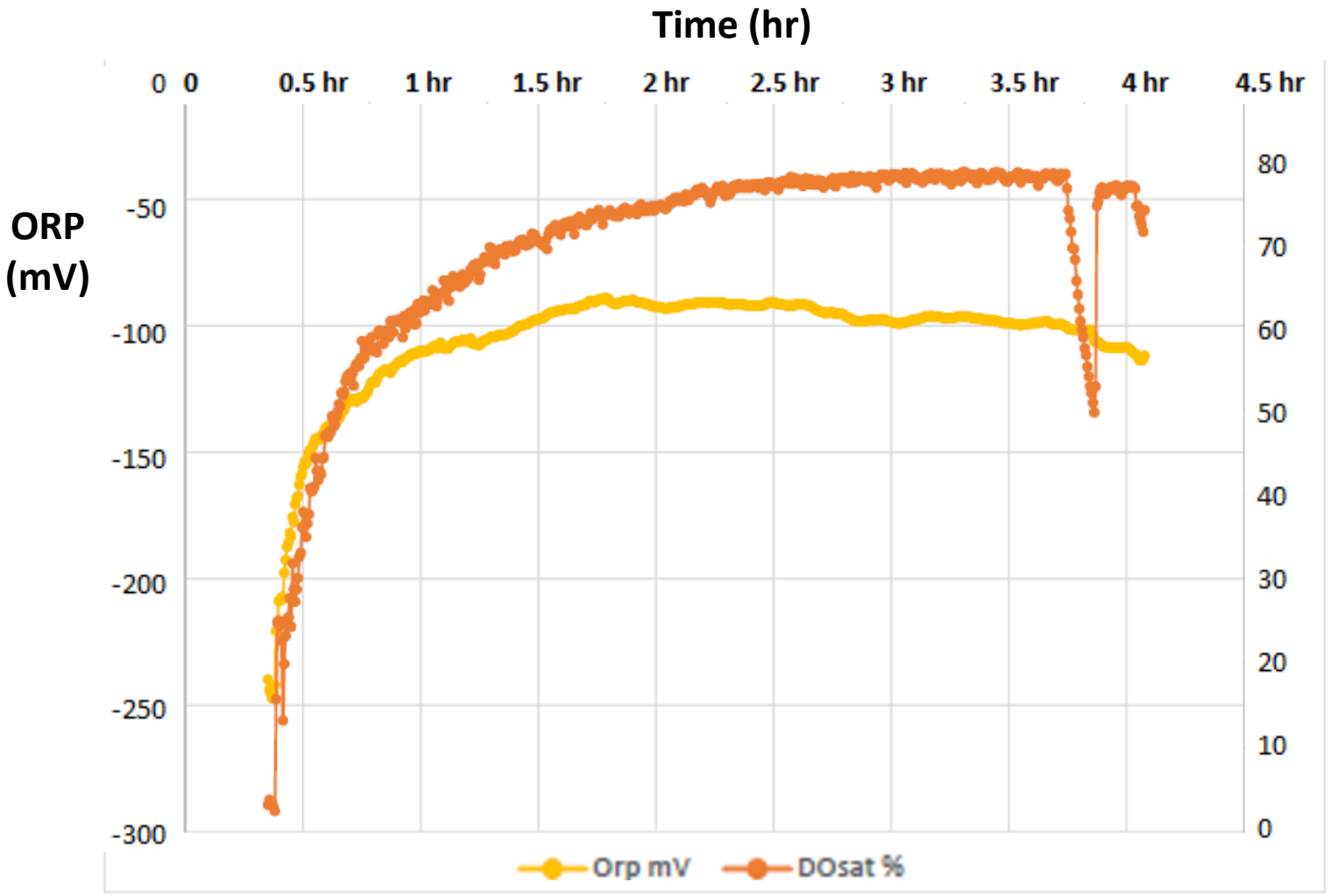
- The Aeromax Aeration system creates bubble sizes primarily ***< 25 micron***
- Course Bubble aeration systems create bubbles of 3,000 – 50,000 micron
- Fine Bubble aeration systems create bubbles of 900 – 3,000 micron



Produced Water Treatment – Submersible Pump Configuration

- Water Temp = 33°C
- pH = 7.25
- TDS = 84,000 mg/L

Produced Water Treatment – Submersible Pump Configuration



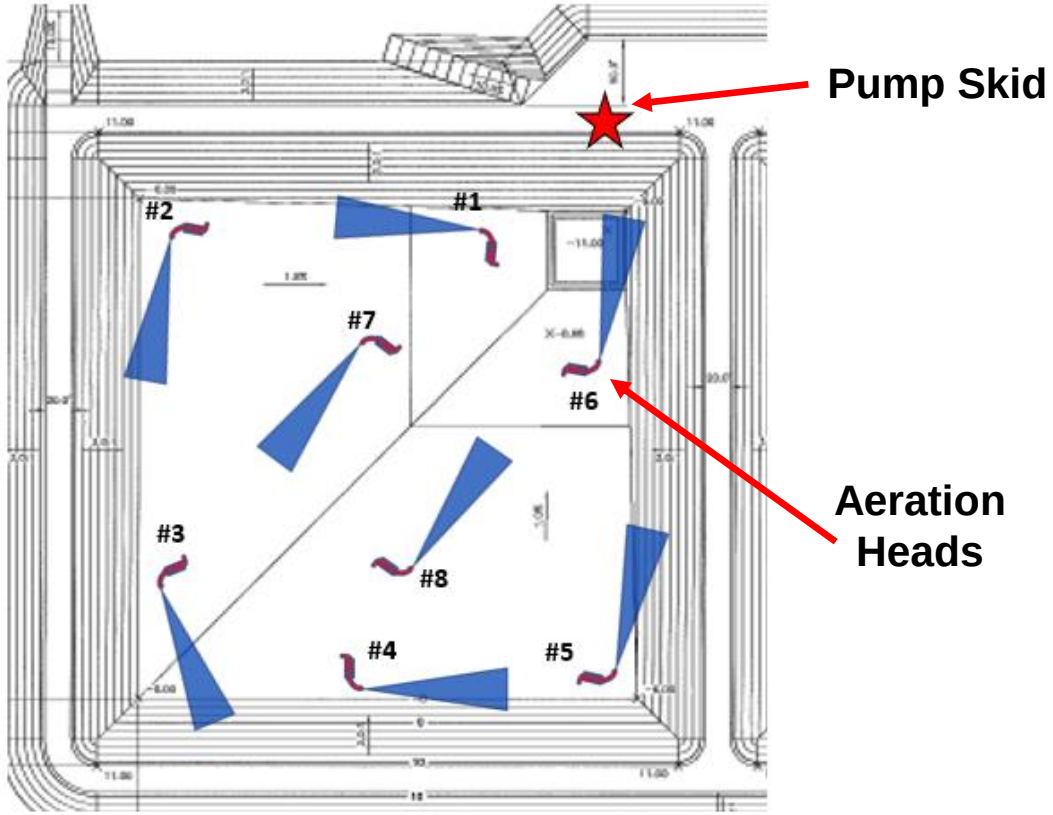
Parameter	At Startup	2.5 hrs
DO (Sat %)	3%	**77%**
Iron (mg/L)	13.7	**5.5**

>50% reduction of iron
with no chemical addition
and only 2.5 hr residence time

Pond & AST Installations – Example Layouts

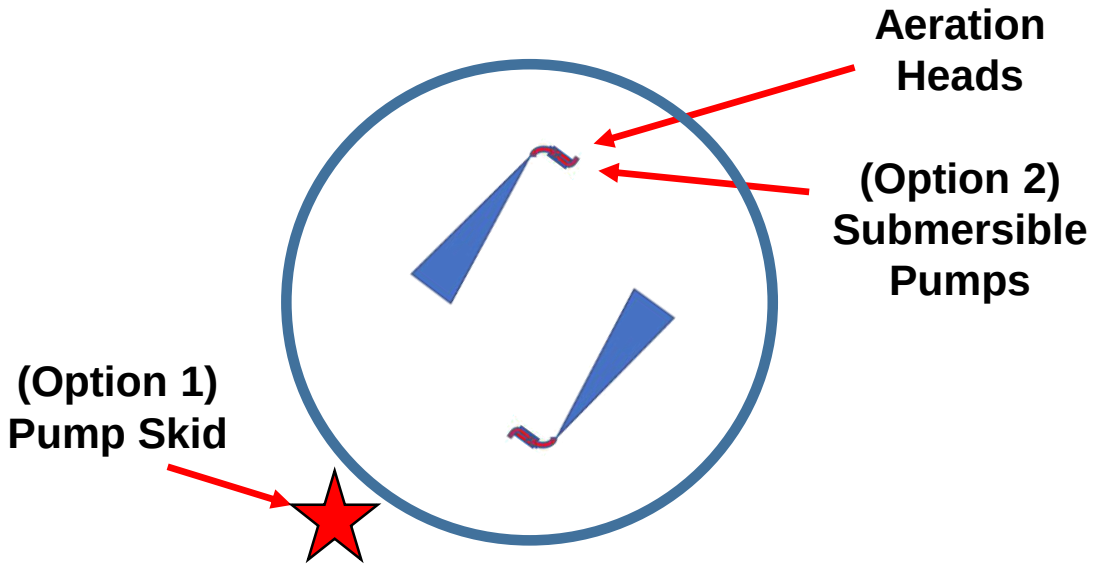
0.5 - 1 MM bbl Pond

- 16’ – 25’ depth
- 8 Aeromax Aeration Heads
- 1 Pump Skids

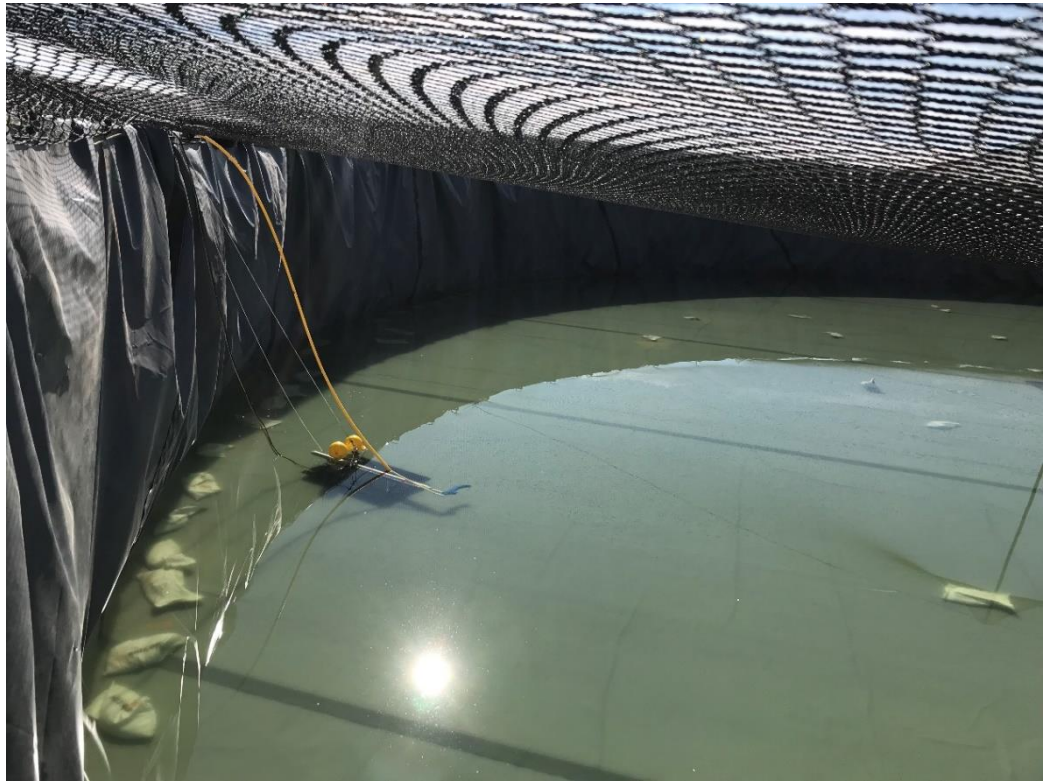


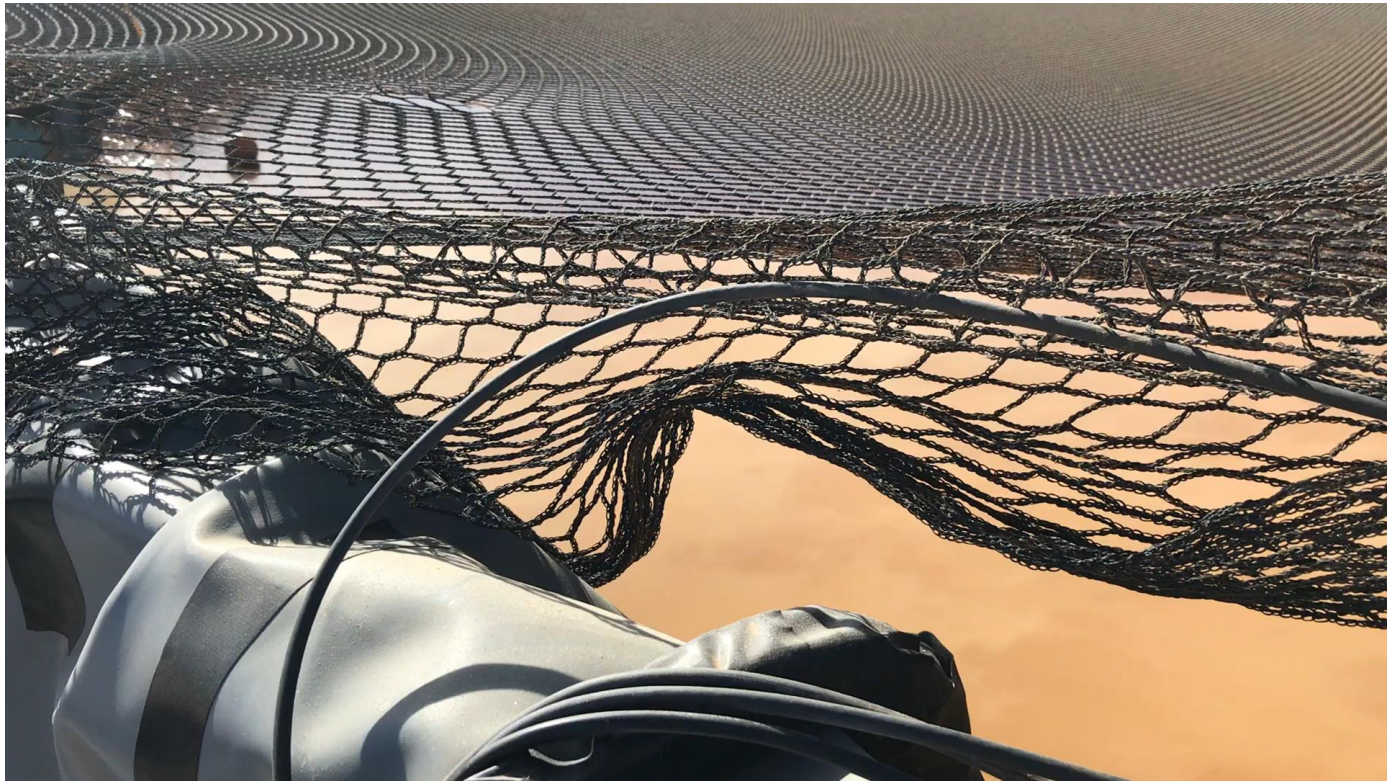
30k – 50k bbl AST

- 8’ – 10’ depth
- 2 Aeromax Aeration Heads
- Option 1 – 1 External Pump
- Option 2 – 2 Submersible Pumps



Produced Water Treatment – Customer AST Installation





Produced Water Quality Maintenance – Customer AST Installation

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Having water treatment challenges?

Contact us to discuss your options for:

Commercial Solutions • Pilot Studies • Feasibility Testing

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