

Upstream O&G Water Management Tools



Upstream O&G operations often require substantial quantities of suitable water at the right place and right time. Rapid identification and mitigation of frequently changing water management challenges are essential to avoiding costly disruptions.

GSI currently operates the **Water Management Tool** and is developing a new tool, **RTL-H2O**, which will be a comprehensive water management software application, combining fundamental hydrologic calculations with optimization and forecasting modules to improve reliability and reduce uncertainty in all phases of upstream O&G water management.

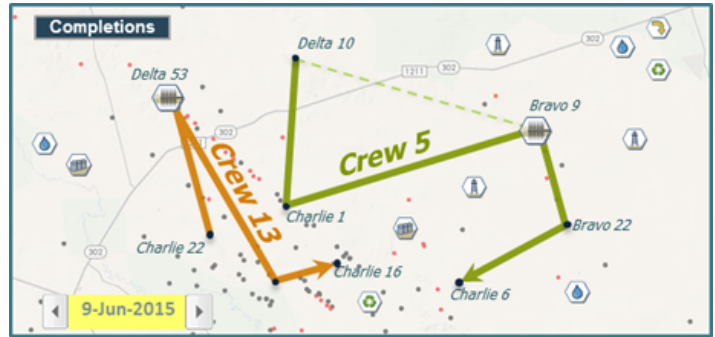
NATURE OF THE PROBLEM

- Effective water management is essential to successful shale oil and gas operations, where sufficient quantities of water of suitable quality must be available at the right place and the right time.
- Operations managers count on water managers to address a wide range of technical and logistical challenges to achieve company goals, meet critical schedules, and respond to rapidly changing conditions.
- With currently available tools, water managers are limited in their capacity to process large volumes of information necessary to support critical decision-making and sustain efficient day-to-day water management practices. They need practical software solutions capable of integrating real-time drilling and completions schedules into daily water management strategies.



PROPOSED SOLUTION

- Fundamental equations for water flow and chemical mass balance can be combined with optimization and forecasting modules to improve reliability and reduce uncertainty in the procurement, delivery, and utilization of water and related resources.
- GSI has developed the **Water Management Planning Tool** for evaluating **alternative water supply, storage and transport options to meet overall demand for hydraulic fracturing operations**, based on approximately 30 key field-specific inputs.



- We are now developing **RTL-H2O**, a first generation, integrated software application specifically designed to support **real-time planning and response to water needs** associated with **day-to-day upstream O&G operations**, including drilling, completions, flowback recovery, and production. Internal functions are operational and GSI is seeking funding for the front-end interface.

HOW IT WORKS

- RTL-H2O seamlessly integrates key hydrologic analyses with mapping, data management, and logistics/scheduling within a web-based dashboard to:
 - Coordinate short-term logistics with rapidly changing needs and unexpected conditions
 - Track and report actual resource utilization and performance metrics.
- For field-wide O&G operations, the software forecasts total water needs, infrastructure requirements, and costs (water supply, storage, transport, treatment/recycling, and disposal).
- Facilitates tracking of historical and anticipated resource use and costs among multiple assets.

BENEFITS

- Enable O&G water managers to more efficiently manage day-to-day water logistics.
- Compared to current methods, more readily identifies, assesses, and mitigates your upstream water management challenges-i.e. **work smarter, not harder**, while reducing your total water costs.

CONTACT INFORMATION

Richard L. Bowers, P.E. (rlbowers@gsi-net.com), Ann P. Smith, P.E. (apsmith@gsi-net.com); 512.346.4474



Contact Us

2211 Norfolk, Ste. 1000
Houston, TX 77098-4054
713.522.6300
info@gsi-net.com

9600 Great Hills Tr., Ste. 350E
Austin, TX 78759-5744
512.346.4474

4590 MacArthur Blvd., Ste. 285
Newport Beach, CA 92660
949.679.1070

155 Grand, Ste. 704
Oakland, CA 94612
510.463.8484