Kuwait – Integrating Geospatial IT Services with Laboratory Services

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Overview

- Introduction to Kuwait Project Goals
- Triad Approach
- Project Challenges
- Technical Capabilities/Experience
- PDA Demonstration
- Summary
Kuwait Environmental Damage Claims

Key Elements

- Assessment of environmental damages caused by the 1990-91 Iraqi Aggression.
- Gather data to support claims that the State of Kuwait submitted to the UN Compensation Commission
- Seek compensation from Iraq for environmental Damages
- ASC has analyzed ten of thousands samples from Kuwait

ASC provided laboratory support for claims submitted to the United Nations for the cleanup of natural resources in Kuwait that were damaged during the 1990-1991 Iraqi aggression.
Kuwait Project Studies

- Developed monitoring and assessment studies
  - To quantify the environmental damages
  - Select appropriate remediation measures
  - Evaluate projects approaches

- Develop a comprehensive environmental claims database using a secure, private extranet Web Site.
  - Efficient international information exchange
  - Ease of data sharing from the laboratory

- Established in-country laboratory supported by ASC
Kuwait Shore Study

- Project required numerous matrices.
- Method development of Biota sampling
- UN Sanctioned Deadlines!
- Clearing Customs & maintaining sample integrity led to Triad approach and development of IT solutions
Triad Approach

- Integrated systematic planning between field and laboratory staff
- Goal to manage uncertainty through increasing sampling effort, use of field screening and use of pilot scale studies
- Real time communication between staff and management
Triad Approach

- Integrated systematic sampling for variations of sand layers
- Implemented our SOPS, QA and sample preparation techniques in the Kuwait laboratory- improving comparability between labs and field screening methods
- Field teams closely communicate with project oversight team
Why Triad-interactive approach?

- Improve cost-effectiveness
- Increase confidence of sampling activities
- Ability to adapt to field conditions
- Phase-in approach to finding the outcome of the project
Project Challenges

- Matrices
  - Saltwater interferences
  - Marine organisms
  - Marine sediments
  - Aged Crude oil

- Method Development
  - determine the asphaltene content of a mixture of aged crude oil and sand-referred to as “tarcrete”
Project Challenges

- Biotreatability feasibility studies
  - To determine the effectiveness of bio-remediation spilled crude oil in a desert environment.
  - Develop field screening methods for in-country use
- International Communication with field teams
  - Cultural and geographical differences
- Sample Receipt-communicating through language and time zone barriers
Field Data Collection

Deliver Efficiency, Quality, Cost Savings

- Real-time Digital Capture of Data
- Integrated GPS & Position Readout
- GIS Integration
- Interfaced with ASC’s LIMS
- Development of project specific IDs and protocols
- Increase # of samples collected--lower variability of data results
- Customized Database – Standardization of fields
Mobile Data Collection Features

- Customized Drop Down Menus
- Standardized field data descriptions
- Auto-complete dictionary
- Field Data is downloaded from Field Devices on a daily basis
- Database quality control methods built into the daily data downloads
- Field data is available via web based management system
Chain of Custody

- Collect data in the field – accurately and efficiently
- Integrated into LIMS
- Customized reports & queries
- Easy to track and Easy to use
Remote Sensing Integration

- Integrated high resolution IKONOS and Landsat Imagery into the Mobile Application
- Created feature layers from Imagery
- Used imagery as a base GIS Layer
Web Based Data Management

System Overview:
- Web Base Data Management
- Over 2.5 Million records in the Database
- FGDC Compliant

Key Services:
- Internet Mapping
- Database design
- PDA Field Data Collection
  - Integration of barcode scanners & GPS

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File Security

- Data transfer integrated 128 Bit Encryption – Secure Socket Layers (SSL)
- Individual User Names and Passwords
- Real Time logs of who is on your web site for Administrators & Management
Kuwait Field Activities

- Field PDA’s linked to GPS as well
- Real time collection of sampling data including GPS Coordinates
- Tens of thousands of samples analyzed by ASC
- Directly linked to ASC’s LIMS
Benefits of Mobile Technology

- Easily Portable
- Faster Data Processing
- Higher Quality of Data
- Built-in QA/QC checks
- Standardization of Data
- Reduces Data Error
- GPS Capabilities
- Digital Photos
- Barcode Scanners
Analytical Services Center

Quality       Performance       Stability

Interfaced with field teams directly
Electronic C-O-Cs sent directly to ASC
Samples bar coded in field
Streamlined shipping and clearing customs for delivery
Advance notification of sample shipping through PDA interface

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**Triad Benefits**

**Project Notification**
- Electronic Chain of Custody linked to LIMS each day
- ASC Project Manager notified
- Progress of field teams easily reviewed
- C-O-Cs prepared sample log-in for sample receipt. Assisted in proper staffing

**Log-in**
- C-O-C’s included sample bar coding
- Bar coded into our LIMS directly upon receipt
- Log in time cut from about 1-1 ½ hours per cooler to 10-15 minutes!
- Removed errors in interrupting field IDs

**Analysis**
- Project criteria developed through PDA and field teams entered directly to ASC LIMS
- Analyte lists coded for projects
- Eliminated re-work due to lack of project details
Triad Benefits

**Reporting**
- Electronic Chain of Custody eliminated errors at sample log-in
- Reports correct
- Data transferred to website for effective communication

**Data Validation**
- Use of PDA and Bar Coding virtually eliminated report errors
- Estimated cost of validation hours cut by 70-80%
- Efforts spent on evaluating data not checking for errors
Summary

- IT interface with LIMS critical to success in analytical testing success
- Responsive, Proven Project Delivery
- Innovative, Value-Added Approaches lends to other applications
- Leading Edge IT/GIS and Data Management Applications
- Create solutions with or clients issues in mind
- Triad Approach interfaced with your laboratory can be successful
Mobile Demonstration

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