Kuwait – Integrating Geospatial IT Services with Laboratory Services

August 17, 2004

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Overview

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

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Kuwait Environmental Damage Claims

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

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

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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

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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

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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

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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

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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

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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”

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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

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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

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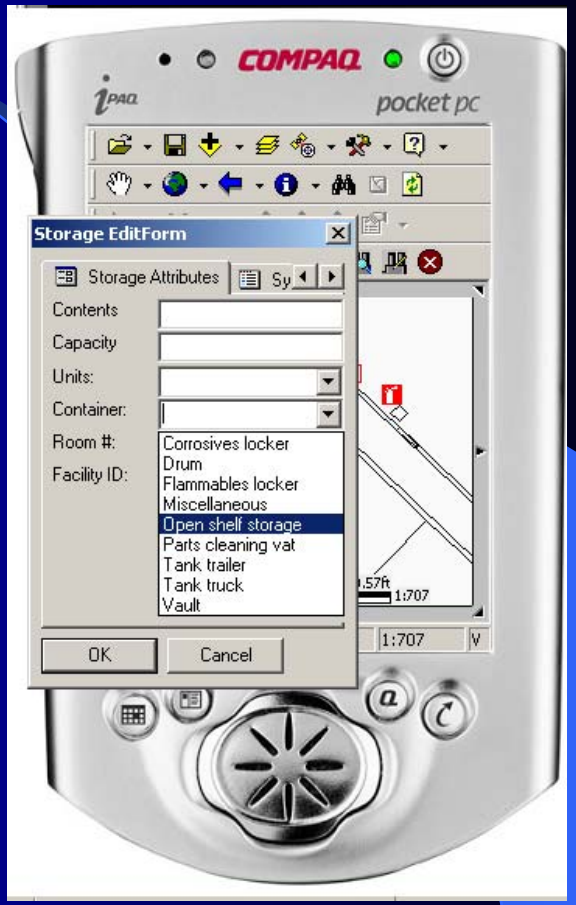
Mobile Data Collection Features

- 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



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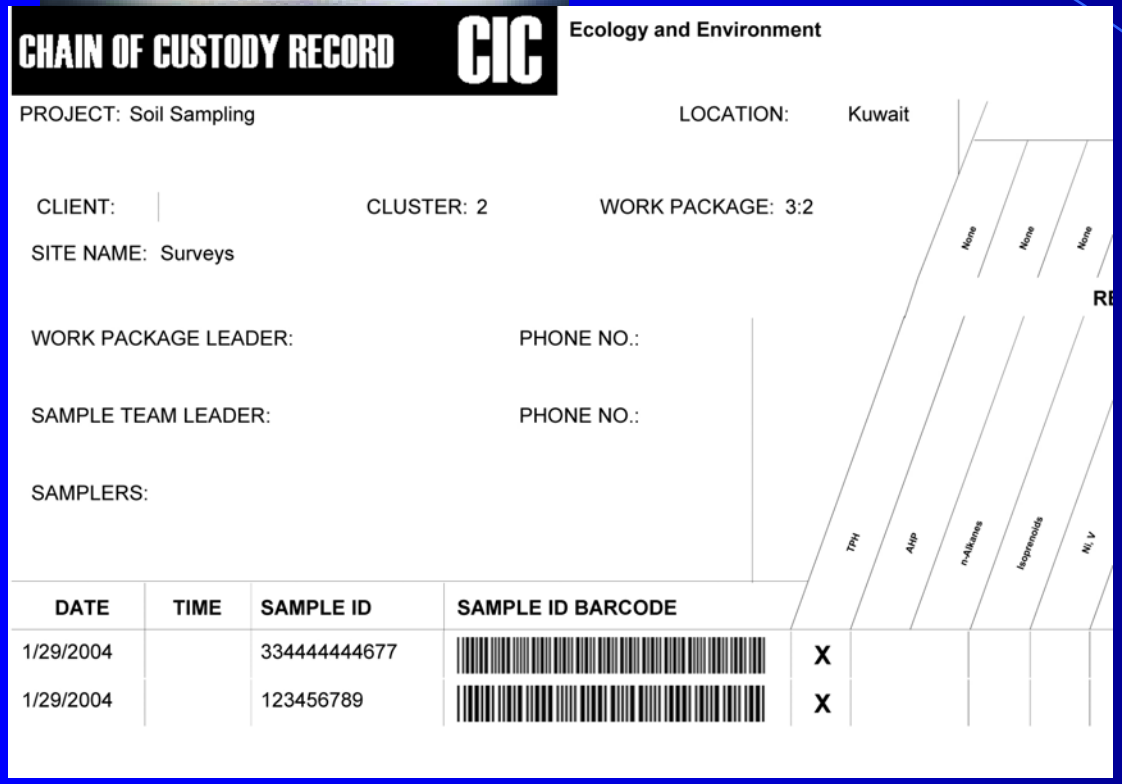
Chain of Custody



CHAIN OF CUSTODY RECORD CIC Ecology and Environment

PROJECT: Soil Sampling LOCATION: Kuwait

CLIENT: CLUSTER: 2 WORK PACKAGE: 3:2

SITE NAME: Surveys

WORK PACKAGE LEADER: PHONE NO.:

SAMPLE TEAM LEADER: PHONE NO.:

SAMPLERS:

DATE	TIME	SAMPLE ID	SAMPLE ID BARCODE	TPH	Anlp	n-Alkanes	Isoprenoids	Ni, V	None	None	None	RE
1/29/2004		334444444677		X								
1/29/2004		123456789		X								

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

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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

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SPACE IMAGING

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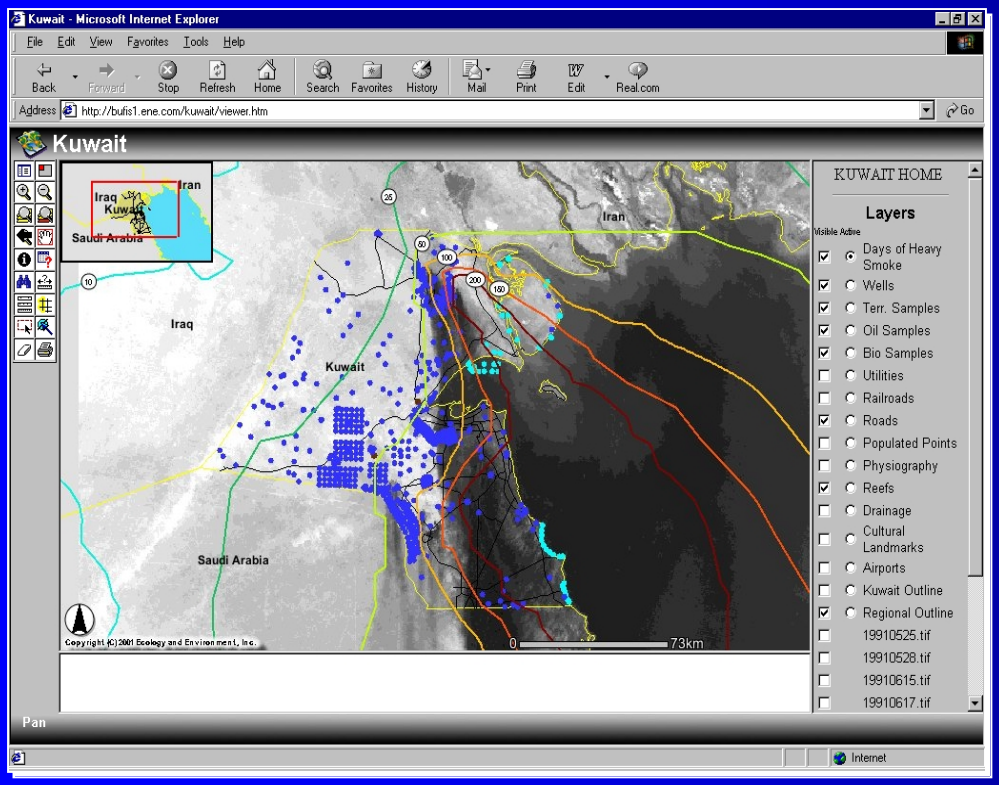
Web Based Data Management



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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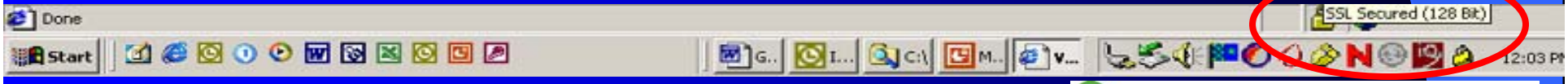
File Security

- 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



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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

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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

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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

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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

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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

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Mobile Demonstration

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