

**Shaw** The Shaw Group Inc.

# ShawMEC

Linda Hughes, GISP  
Senior GIS Analyst/Business Analyst

Jack Tortolano, EOD  
Senior UXO Supervisor



# ShawMEC

- Purpose
- What It Is/What It Isn't
- Savings
- Toolkit
- Project Work Flow/Data Flow
- Tabular Reporting
- GIS Mapping
- Nuts & Bolts



# Acknowledgements

## ShawMEC Development Team:

Eric Haseltine

Randy Holtzclaw

Linda Hughes

Johnny Lang

Jeff Haney

Judy Reagan, Manager

## Acknowledgements:

Marty Miele, Discipline Lead-  
Geophysics

Chuck Nycum, Sr .Geophysicist

Jeremy Flemmer, Sr. Geophysicist

John (Jack) Tortolano, SUXOS

Bruce Tincknell, SUXOS

Peter Kelsall, Ft. Ord P.M.

Eric Schmidt, Ft. Ord I.M.

Kevin Siemann, Ft. Ord Site Mgr.

John Elliott, Ft. Sill P.M.

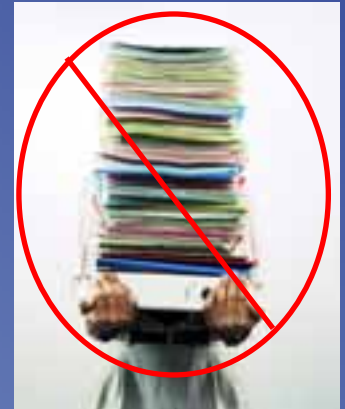


# ShawMEC Purpose

- To support Shaw's Munitions and Explosives of Concern (MEC) Clearance projects by standardizing and streamlining data collection procedures, managing data in a centralized database, and providing near real-time GIS data display.

# Standardize/Streamline

- Standardize/streamline data collection procedures
  - Only details must be addressed at the individual project level, depending upon conditions/requirements
  - Ensure that all necessary information is collected
  - Maintain consistent/proper nomenclatures and terminology
  - Labor savings in:
    - Paper data collection and compilation of same
    - Reconciliation of multiple data sources



# Manage Information

- **Manage data in a centralized database**
  - **Avoid reconciliation of multiple versions of files/spreadsheets**
  - **Data Normalization**
  - **Standard Reporting**
  - **Standard GIS Mapping**
  - **Labor savings in:**
    - **Formatting for GIS/tabular deliverables**
    - **Maintenance of standard nomenclatures/terminology**
    - **Data Accessibility**

# GIS Integration

- **Seamless Integration of Field Data with GIS**
  - **Field Operational Support**
  - **Work Status**
  - **ArcGIS Server web mapping (In Progress)**

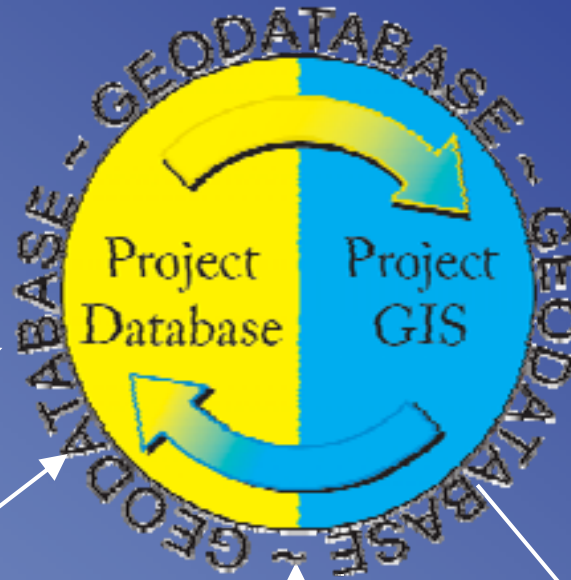
# ShawMEC Information Management System

INPUT :

Project Set-up Information  
(Areas to be cleared, types of operations, personnel, equipment, etc.)

Geophysics Anomaly Lists

GIS Layers

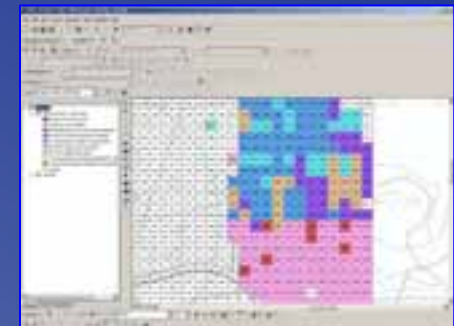


Data synchronization – Hand-held unit to/from GIS/database



OUTPUT:

Field Operation Status Maps



Daily Production Rates

Final Dig Lists





# ShawMEC

- **What It Is:**

- **Collection of:**

- **Database**

- **Hand Held Computer Application**

- **Desktop Application**

- **Desktop GIS Integration**

- **Reporting tools**

- **Scalable**

# ShawMEC

- **What It isn't:**

- **GPS**

- **Not a field GIS or GPS data collection software**

- **Clearance/DGM polygons defined in the field**

- **Roads/access paths cleared for subsurface**

- **Constructed features**

- **Range Targets**

- **Does record Lat/Long from internal or external GPS NMEA string (for Items found)**

- **Not a Geophysics metadata information mgmt tool**

- **Geophysics have specific data requirements including metadata for the field data collection and data processing.**

# ShawMEC Cost vs. Savings

- Implementation Costs:
- Hand held field computers
  - \$650+ each
- Information Management/GIS Support for Start-up (40 - 100 hours or less)
  - Project database set-up (reference tables, planned ops, etc.)
  - Define details of project specific data flow needs
  - Install and test application(s)
  - Train field personnel as needed for data entry requirements
- Information Management/GIS Support - ongoing project needs (1-9 hours/day)
- Project Savings:
  - UXO Team Leader - ~ 5-10 minutes per grid saved (100 hrs per 600 grid site)
  - UXO QC – ~ 15 minutes per grid saved (150 hours per 600 grid site)
  - GIS Maps for field operations support – reducing ~1 hour (or more) per map
  - GIS Maps for reporting– reducing ~1 hour (or more) per map
  - Paper Costs

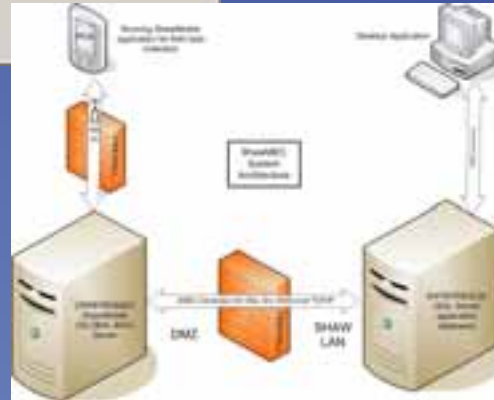


# ShawMEC Toolkit

## Software



## Equipment/Hardware



## People



# ShawMEC Toolkit - Software

- Software

- SQL Server
- Microsoft Access Data Project front-end
- ShawMobile (Global Bay Access Point)
- ActiveSync
- ArcGIS

# ShawMEC Toolkit - Hardware

- **Equipment/Hardware**
  - **Mobile Computers**
  - **Desktop/Laptop Computer(s)**
  - **Stable Internet**

# ShawMEC Toolkit - People

## • People

- Information Managers
- GIS Analysts
- Geophysicists
- UXO Field Personnel
- UXO QC Specialists

# ShawMEC Work/Data Flow

- **Geophysical Investigation Projects**
  - Digital Geophysical Mapping (DGM)
  - DGM Data Processing
  - Anomaly Identification
  - Anomaly Reacquisition
  - QC of Reacquisition Data
    - Define anomalies to be excavated
  - Anomaly Excavation
  - Demolition Operations
  - QC of Excavation Data
  - Final QC by Geophysicist
  - Client Submittal(s)
  - Submittal Results (Client QA Approval)



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Project ID	Date	Status	Comments	Action
10000001	2000-01-01	Completed	Final QC	Final QC
10000002	2000-01-01	Completed	Final QC	Final QC
10000003	2000-01-01	Completed	Final QC	Final QC
10000004	2000-01-01	Completed	Final QC	Final QC
10000005	2000-01-01	Completed	Final QC	Final QC
10000006	2000-01-01	Completed	Final QC	Final QC
10000007	2000-01-01	Completed	Final QC	Final QC
10000008	2000-01-01	Completed	Final QC	Final QC
10000009	2000-01-01	Completed	Final QC	Final QC
10000010	2000-01-01	Completed	Final QC	Final QC

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Final QC (See Final QC Project 1, (All Records))

Display Records:  All  Pending  Passed  Failed  Find by:  Zone/Task:  Filter: OFF

Find by:  Zone/Task:  Filter: OFF

Final QC Date:  Final QC By:  Final QC Passed:  Final Agreement Dig Results To Go:

Final QC Pick:

Records: 23 of 100

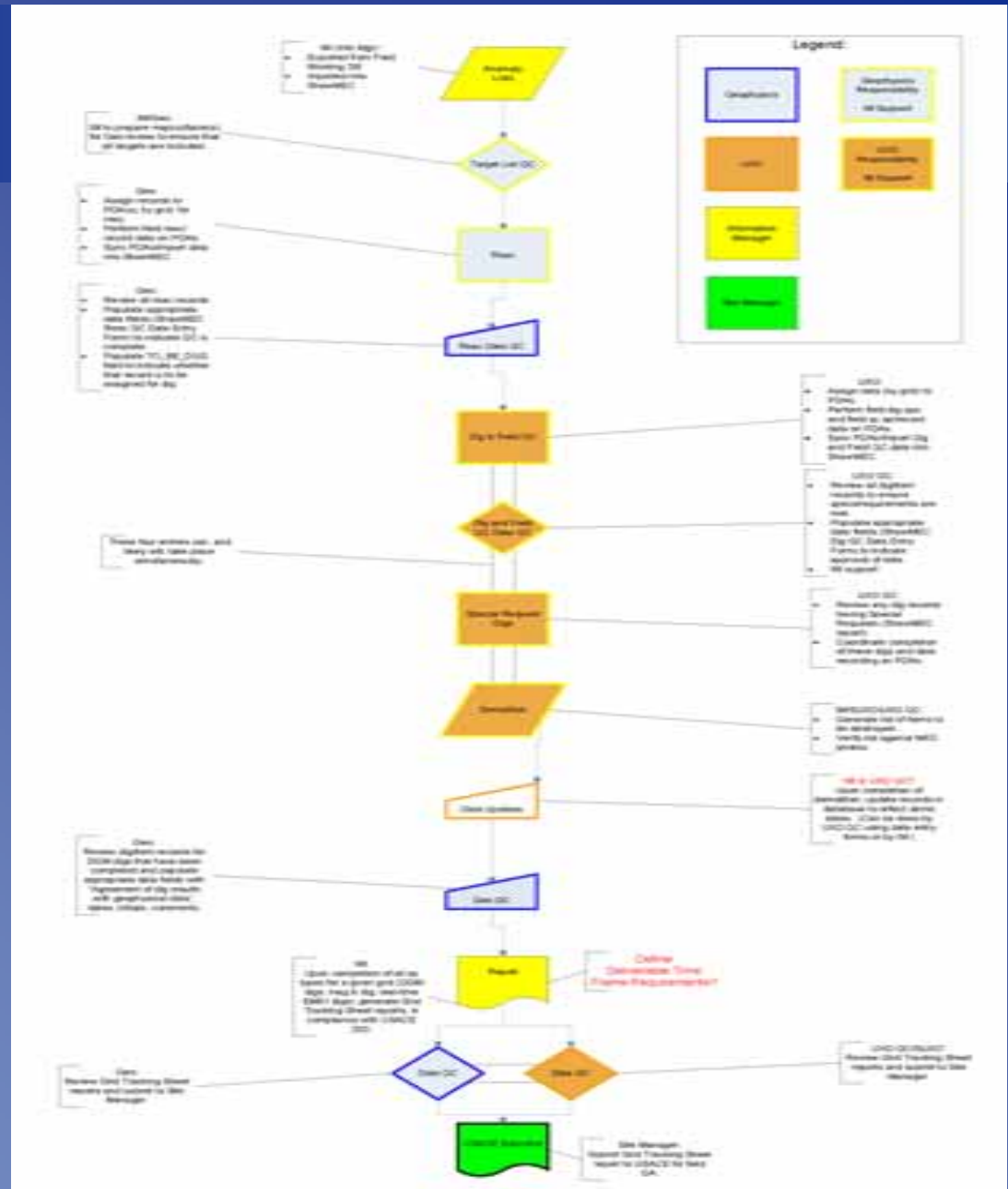
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U.S. ARMY CORPS OF ENGINEERS, OMAHA DISTRICT MILITARY MUNITIONS REMEDIATION SECTION MEMO		
TO: Shaw Environmental, Inc.	DATE: 11/10/08	TIME: 1630
CONTRACT NUMBER: W912DY:04-D-0010	PROJECT LOCATION: New Boston Air Force Station (NBAFS) New Boston, NH	
DOT/OW: 0010		
SUBJECT ITEM(S) <input type="checkbox"/> Work Plan <input type="checkbox"/> Safety Violation <input type="checkbox"/> Safety Comments	(Check all that apply) <input type="checkbox"/> Quality Control <input checked="" type="checkbox"/> Other	
DESCRIPTION: The following NBAFS grids passed USACE Quality Assurance inspection for surface clearance in accordance with the Scope of Work (SOW): AA25, BB21, BB22, CC21, CC22, CC23, DD21, DD22, DD23, EE22, FF22, FF23, GG22, GG23, HH22, HH23, II22, II23, JJ22, KK22, and LL22.  <input checked="" type="checkbox"/> Please update project files.		
		_____ USACE Site Representative
		_____ Contractor's Representative
ACTION TAKEN:  		
CENWO FORM 948		

# Data Flow

# Geophysical (DGM) Investigation Projects





# ShawMEC

- **Status Tracking for Other Operations Types**
  - **Vegetation Removal**
  - **DGM Survey**



# ShawMEC - Reporting

- **Status**
  - **Field Operations**
  - **QC of Field Operations**
  - **Planned vs. Complete**
- **MEC Items**
- **QC/QA Seeds**
- **Debris Weight**
- **Daily Operations Summary**
- **Team Leader Log (In Progress)**
- **Basic Labor Tracking (In Progress)**

# ShawMEC Web Reporting

Report Manager - Microsoft Internet Explorer

Address: http://localhost/Reports/Report.aspx?ServerPath=/27944/MEC/Reports/27944/GR/ops

SQL Server Reporting Services  
Home > ShawMEC Reports > DailyGridOps

Home | My Subscriptions | Help

Search for:

View Properties Refresh Subscriptions

New Subscription

Facility:  View Report

11 of 28 of 28 100% Find Grid Ops Select a format

### Daily Grid Ops Report

Op Date	Zone/Task	Team Lead	SPID	Grid Op Type	Count	Grid Op Complete?	Grid Op Complete Date	Use MD	Use Other Data	Percent Done
<b>New Subscriptions</b>										
<b>12/11/2008</b>										
	Surface	BROWN	K39	Surface Sweep	0	Y	12/11/2008	25.00	0.00	
	Surface	BROWN	T29	Surface Sweep	0	Y	12/11/2008	28.00	3.00	
	Surface	OMN	K35	Surface Sweep	0	Y	12/11/2008	5.00	0.00	
	Surface	OMN	K36	Surface Sweep	0	Y	12/11/2008	1.00	0.00	
	Surface	OMN	K37	Surface Sweep	0	Y	12/11/2008	3.00	0.00	
	Surface	HENSTERMACHER	W39	Surface Sweep	0	Y	12/11/2008	25.00	21.00	
	DGM Subsurface	SUSE	4X17	Accquisition	11	Y	12/11/2008			
	DGM Subsurface	SUSE	4X08	Accquisition	20	Y	12/11/2008			
	DGM Subsurface	SUSE	4L17	Accquisition	8	Y	12/11/2008			
	DGM Subsurface	SUSE	4L18	Accquisition	11	Y	12/11/2008			
	DGM Subsurface-Rev1	WATKINS	BE22	DGM Dig	2	Y	12/11/2008			
	DGM Subsurface	WATKINS	BE30	DGM Dig	3	Y	12/11/2008	20.00	0.25	
	DGM Subsurface-Rev1	WATKINS	FF22	DGM Dig	3	Y	12/11/2008		0.25	
	DGM Subsurface	WATKINS	FF29	DGM Dig	16	Y	12/11/2008	11.25	5.50	
	DGM Subsurface-Rev1	WATKINS	GG22	DGM Dig	1	Y	12/11/2008		0.10	
<b>12/10/2008</b>										
	Surface	BROWN	K20	Surface Sweep	0	Y	12/10/2008	28.00	11.00	
	Surface	BROWN	F22	Surface Sweep	0	Y	12/10/2008	31.00	3.00	
	Surface	OMN	K34	Surface Sweep	0	Y	12/10/2008	12.00	0.00	
	Surface	OMN	240	Surface Sweep	0	Y	12/10/2008	313.00	0.00	
	Surface	HENSTERMACHER	Q22	Surface Sweep	0	Y	12/10/2008	0.00	4.00	
	Surface	HENSTERMACHER	Q24	Surface Sweep	0	Y	12/10/2008	2.25	4.00	
	Surface	HENSTERMACHER	S23	Surface Sweep	0	Y	12/10/2008	0.00	0.00	
	DGM Subsurface-Rev1	SUSE	BE12	Accquisition	2	Y	12/10/2008			
	DGM Subsurface	SUSE	BE30	Accquisition	21	Y	12/10/2008			

# ShawMEC Web Reporting

Report Manager - Microsoft Internet Explorer

Address: http://localhost/Reports/Report.aspx?rsid=1&rs=ShawMEC+Reports%2FGridOpSummary

SQL Server Reporting Services  
Home > ShawMEC Reports > GridOpSummary

Home | My Subscriptions | Help

Search for:

Home | My Subscriptions | Help

Grid Op Summary

Facility: Port Ord

View Report

Facility Name	Grid Op Date	Recess	DDH Digs	Mag Digs	MD Lbs	RRD Lbs	RTD-RTI Digs	MD Lbs	RTD-RTI
Port Ord	6/21/2008		88	69	0.5	35.59			
	6/26/2008		69	80		23.94			
	6/25/2008	18	44	22		32.87		138	2
	6/24/2008	49	56	56	4.5	43.82			82
	6/23/2008	66	17	18	0.5	27.3			
	6/19/2008	46	1	1		8			
	6/18/2008	100							
	6/17/2008	43							
	5/7/2008								
	5/6/2008	80	40	40	6.25	4.5			
	5/5/2008							18	7
	5/2/2008							87	14
	5/1/2008							125	8.5
	4/30/2008								
	4/29/2008							31	2.25
	4/28/2008							104	5.25
	4/25/2008							65	22
	4/24/2008							267	58.75
	4/23/2008		1					244	21.5
	4/22/2008							120	10
	4/21/2008							200	85.95
	4/18/2008							56	2.75
	4/17/2008							179	97
	4/16/2008							154	14.75

Selected a format

- Print & Email
- PDF file with report data
- CSV (comma delimited)
- HTML
- Excel (PDF) file
- Excel workbook
- Excel - Excel Workbook via Report Cells
- Excel 2007 - Excel 2007 via Report Cells
- Spreadsheet - Spreadsheet via Report Cells
- CSV - CSV via Report Cells

# ShawMEC Web Reporting

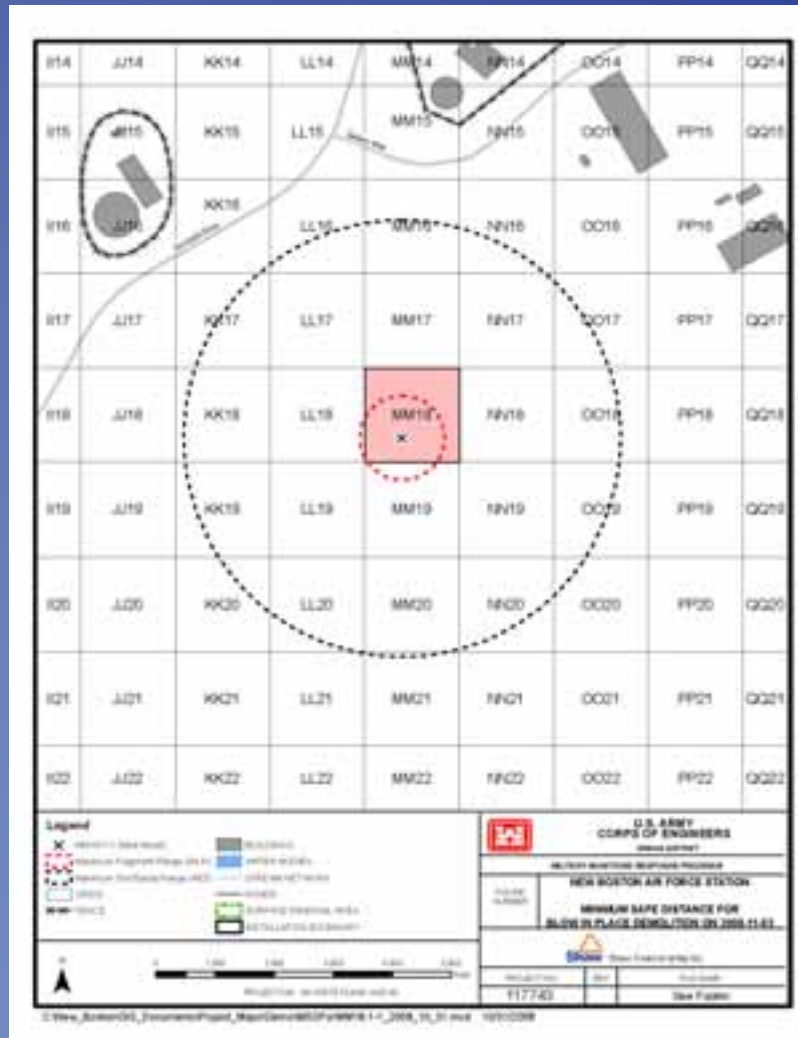
The screenshot displays a web browser window with the URL <http://localhost:8080/Report.aspx?Facility=US2ShawMEC+Reports%2FGridOpsPlannedCompleteSummary>. The page title is "Grid Ops Planned Complete Summary". A search bar is present in the top right. Below the search bar, there is a "New Subscription" section with a "Facility" dropdown menu set to "Testing" and a "View Report" button. The main content area contains a table titled "Grid Ops Planned Complete Summary".

Facility Name	Grid Ops Type	Totals
Testing	Surface Sweep Planned	1200
	Surface Sweep Complete	14
	Surface Sweep Data QC Complete	5
	Reacquisition Planned	76
	Reacquisition Complete	4
	Reacquisition Data QC Planned	76
	Reacquisition Data QC Complete	3
	DGM Dig Planned	76
	DGM Dig Complete	2
	DGM Dig QC Complete	0
	DGM Dig Data QC Planned	76
	DGM Dig Data QC Complete	0
	USACE Submittal Planned	1200
	Real-time EMG Complete	1
	Mag and Dig QC Complete	1

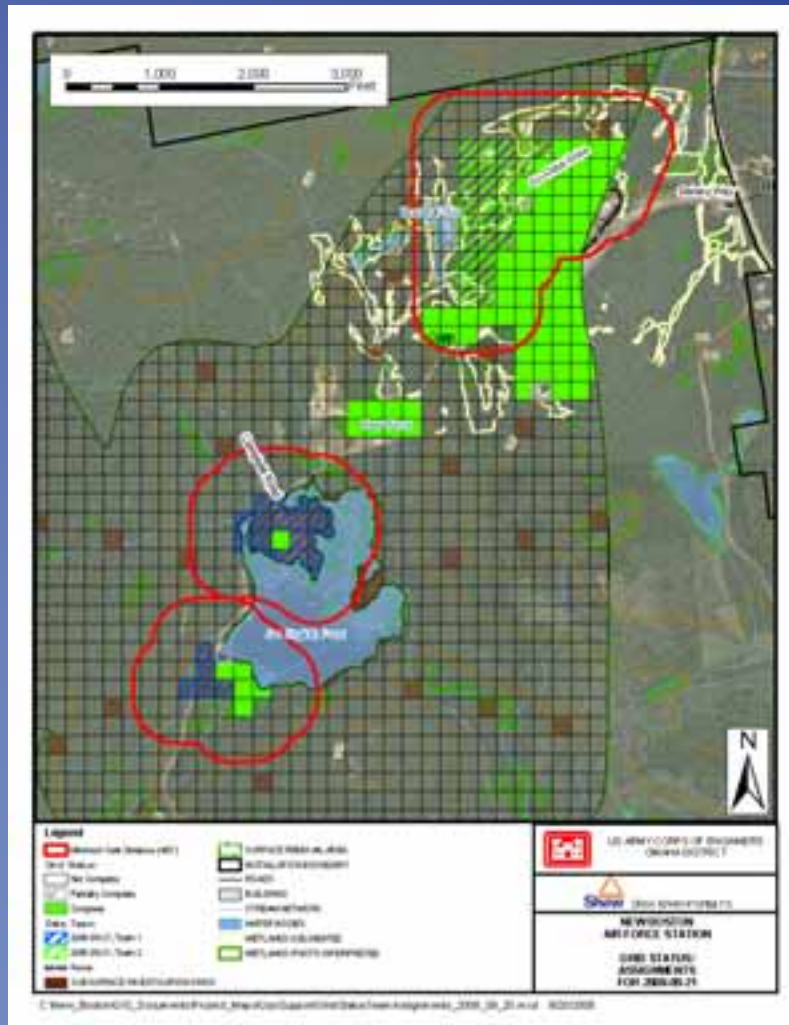
# ShawMEC – GIS Mapping

- **Operational Support:**
  - Grid/Transect Layout
  - Team Assignments
  - Safe Distance Zones
  - Demolition Planning
- **Reporting:**
  - Status
  - MEC Items
  - Debris Weight

# ShawMEC GIS Mapping

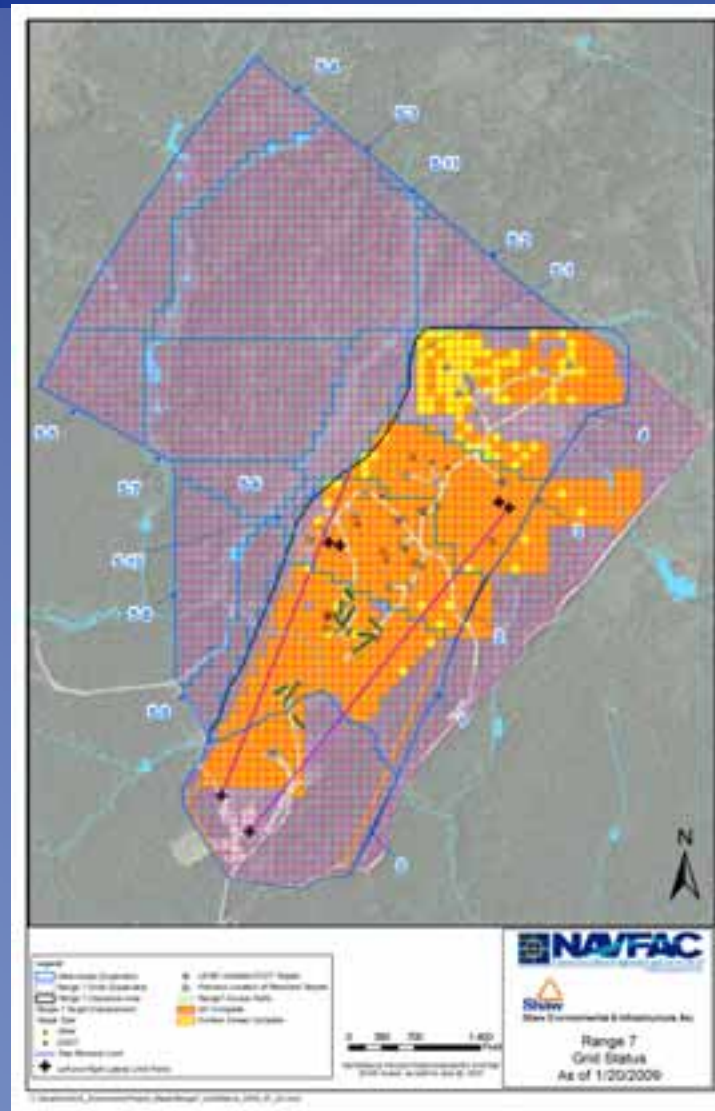


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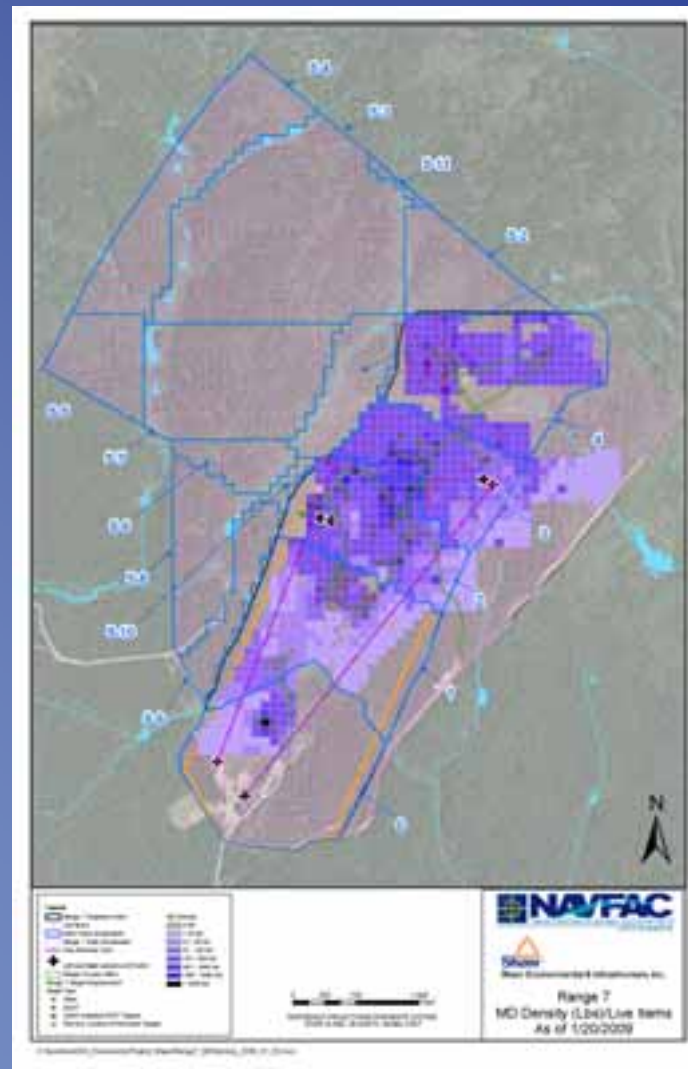




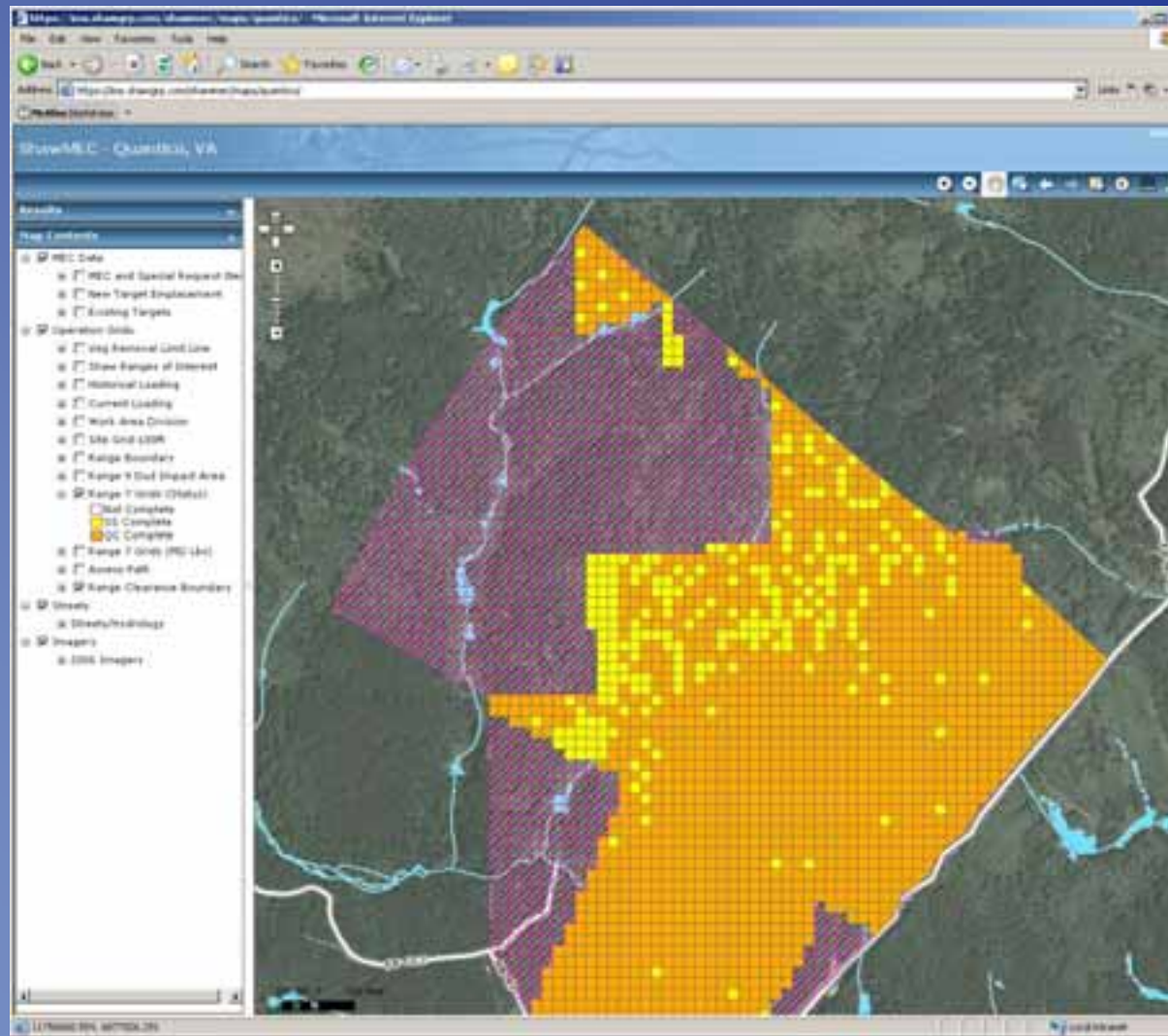
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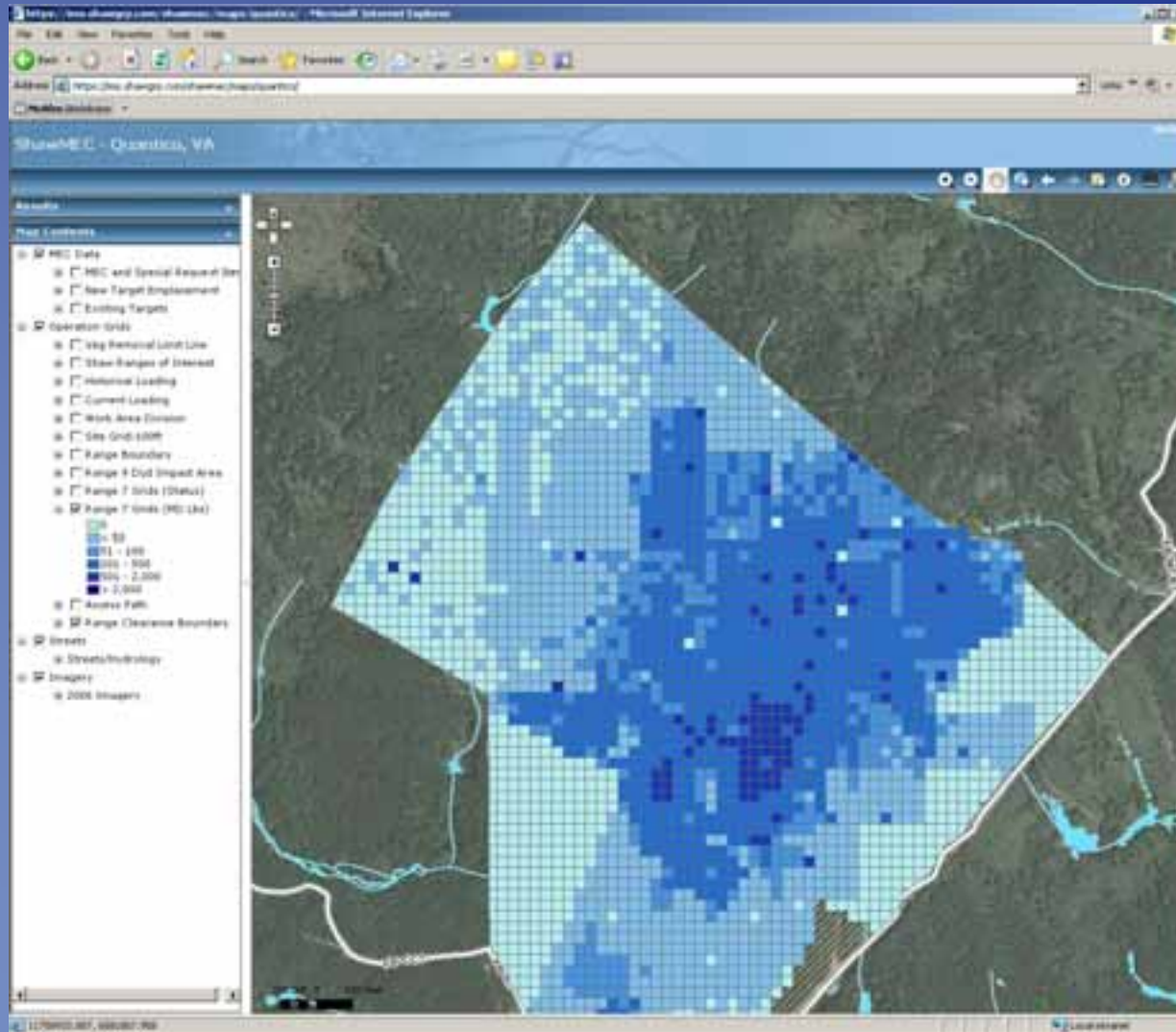
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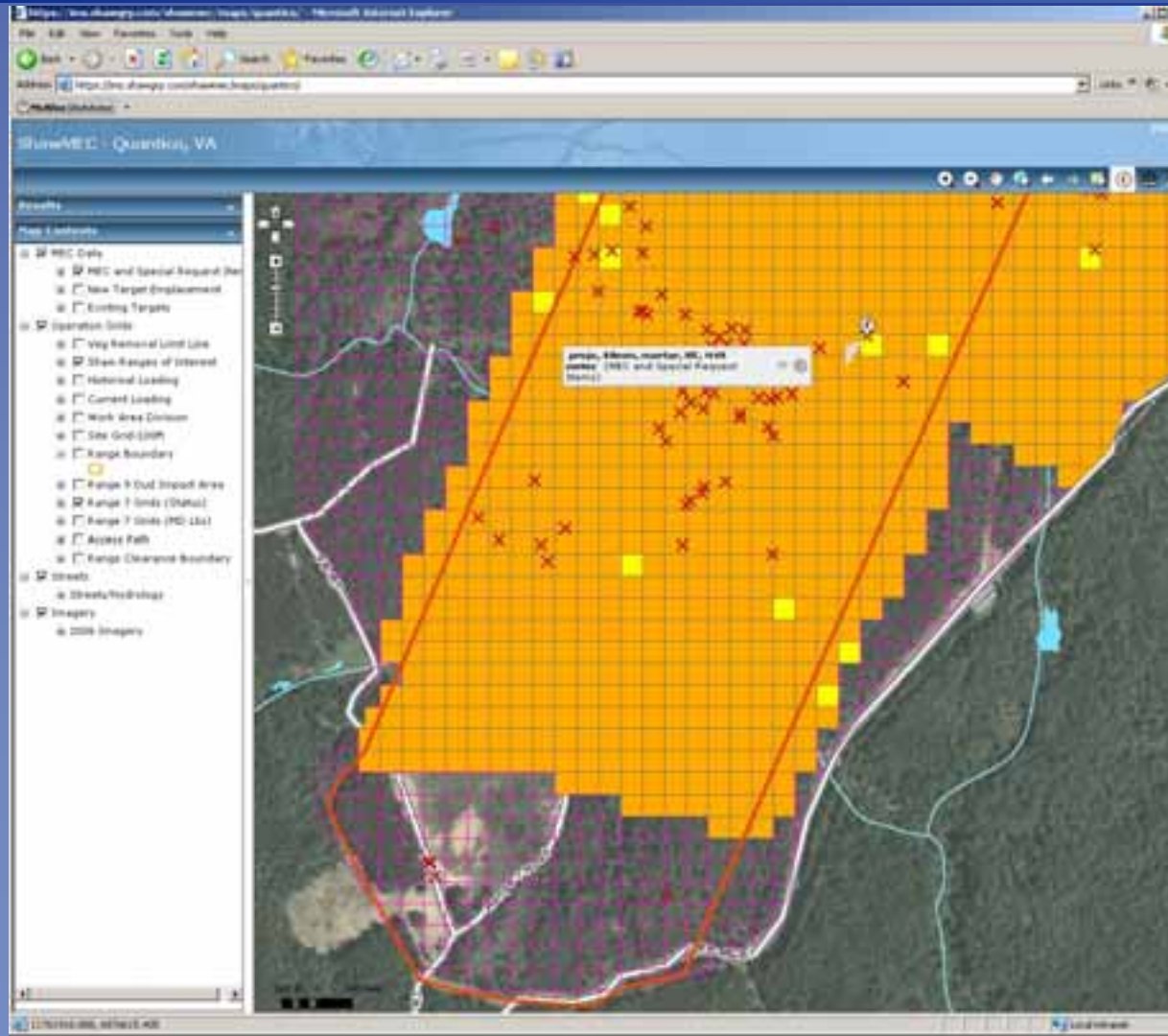
# ShawMEC ArcGIS Server Mapping



# ShawMEC ArcGIS Server Mapping



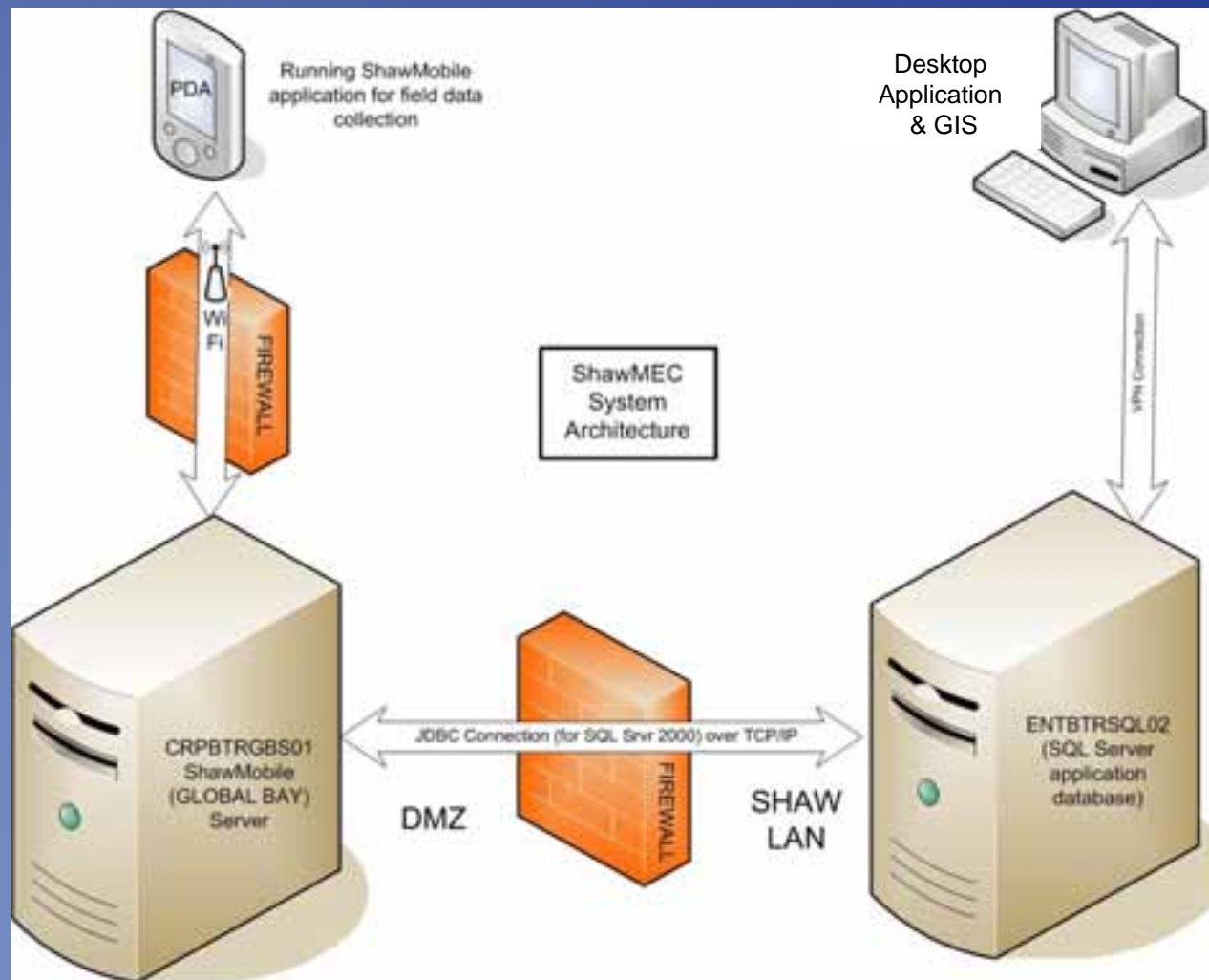
# ShawMEC ArcGIS Server Mapping



# ShawMEC Nuts-n-Bolts

- **Multi-Server**
  - Internet
  - ShawMobile (DMZ)
  - Shaw (Inside Shaw network)
- **Multi-Module**
  - Hand held software application
  - Desktop software application
  - Web reports
- **Table Structure**
  - 3 Basic Data Tables
    - Grid
    - Anomaly
    - Item
  - Ancillary metadata and lookup tables

# ShawMEC System Architecture



# ShawMEC Desktop Application





# ShawMEC Assignment Form

**Dig Assignments**

**Assign Grids/Transects to Fort Ord-2009 Teams for Removal**

Filter Grids/Transects by:

Sort by Grid/Transect

Available Grids/Transects:			Selected Grids/Transects:		
Zone/Task	Grid/Transect	Number To Dig	Zone/Task	Grid/Transect	Number To Dig
DGM-Units18-22	B33134	8			
DGM-Units18-22	B33135	113			
DGM-Units18-22	B33136	77			
DGM-Units18-22	B33137	94			
DGM-Units18-22	B332B4	48			
DGM-Units18-22	B332B5	57			
DGM-Units18-22	B332B6	53			
DGM-Units18-22	B332C0	21			
DGM-Units18-22	B332C9	20			
DGM-Units18-22	B332D0	9			
DGM-Units18-22	B332D9	12			
DGM-Units18-22	B332E0	21			
DGM-Units18-22	B332E9	18			
FCM-18-22	C331A5	70			

Assign to Team:  
Team 1

Dig Team Status							
Facility	Zone/Task	Grid/Transect	Dig Team	To Be Dug	Assigned	Completed	
FTO2	agDig-Units 18-	B333E7	Team 2	0	2	2	
FTO2	agDig-Units 18-	B333E8	Team 2	0	1	1	
FTO2	agDig-Units 18-	B333F7	Team 2	0	1	1	
FTO2	agDig-Units 18-	B333F8	Team 2	0	2	2	
FTO2	agDig-Units 18-	B333G7	Team 2	0	3	3	
FTO2	agDig-Units 18-	B333G8	Team 2	0	2	2	
FTO2	agDig-Units 18-	B333A7	Team 2	0	1	1	
FTO2	agDig-Units 18-	B333A8	Team 2	0	2	2	
FTO2	agDig-Units 18-	B333B0	Team 2	0	1	1	

Record: 1 of 105

# ShawMEC QC Form

ShawMEC

File Edit View Insert Format Records Tools Window Help Add-Ins PDF

MS Sans Serif

Form View

FORM\_Reac\_QC

Reacquisition QC for Fort Sill Project. (All Records)

Project Facility  
Fort Sill

MapSheet Version: 2.11

Target List Data

Facility Code	ZONE_ID	GRID_ID	ANIMALV_ID	QC_POINT
001	000001	010	14	

EQUIPMENT EASTING NORTHING CHANNEL\_1\_RESPONSE

EM1	55296 17	283366 18	18.5
-----	----------	-----------	------

CHANNEL\_1\_RESPONSE CHANNEL\_1\_RESPONSE RESPONSE\_SUM

0	0	0
---	---	---

COMMENTS

Reacquisition Data

DATE REAC ASSIGNED	REAC_TEAM	CHECKED_OUT	REAC_RESPONSE
	1	N	0

SURFACE\_ITEM REAC\_EASTING REAC\_NORTHING REAC\_OFFSET REAC\_OFFSET

N	0	0	0	0
---	---	---	---	---

REAC\_DATE REAC\_SUCCESSFUL

2008-01-03 1:24:00 PM	N
-----------------------	---

REAC\_COMMENTS

Did not get located initially (?). Checked in to reac but reac not successful.

QC Work Data

REAC_QC_DATE	REAC_QC_BY	REAC_QC_PASS	TO_BE_DUG
			N

REAC\_QC\_COMMENTS

Display All Records

Display Ready to QC

Display in Dashboard View

Export Data to Excel File

Filter by Filter Date

01-06-2008

Zone Lookup

Get Lookup

Records: 1

Form View

8/28

# ShawMobile Reac Forms

AccessPoint Mobile Client - Global... - [min] [max] [close]

Application Help

 Shaw Environmental & Infrastructure, Inc.

## ShawMEC

### Reac

Version: 02.00.00

AccessPoint Mobile Client - Global... - [min] [max] [close]

Application Help

Anomaly | Response | **Reac** | Notes

Date/Time

Equipment

Operator

Response

Surface Item?

Offset East

Offset North

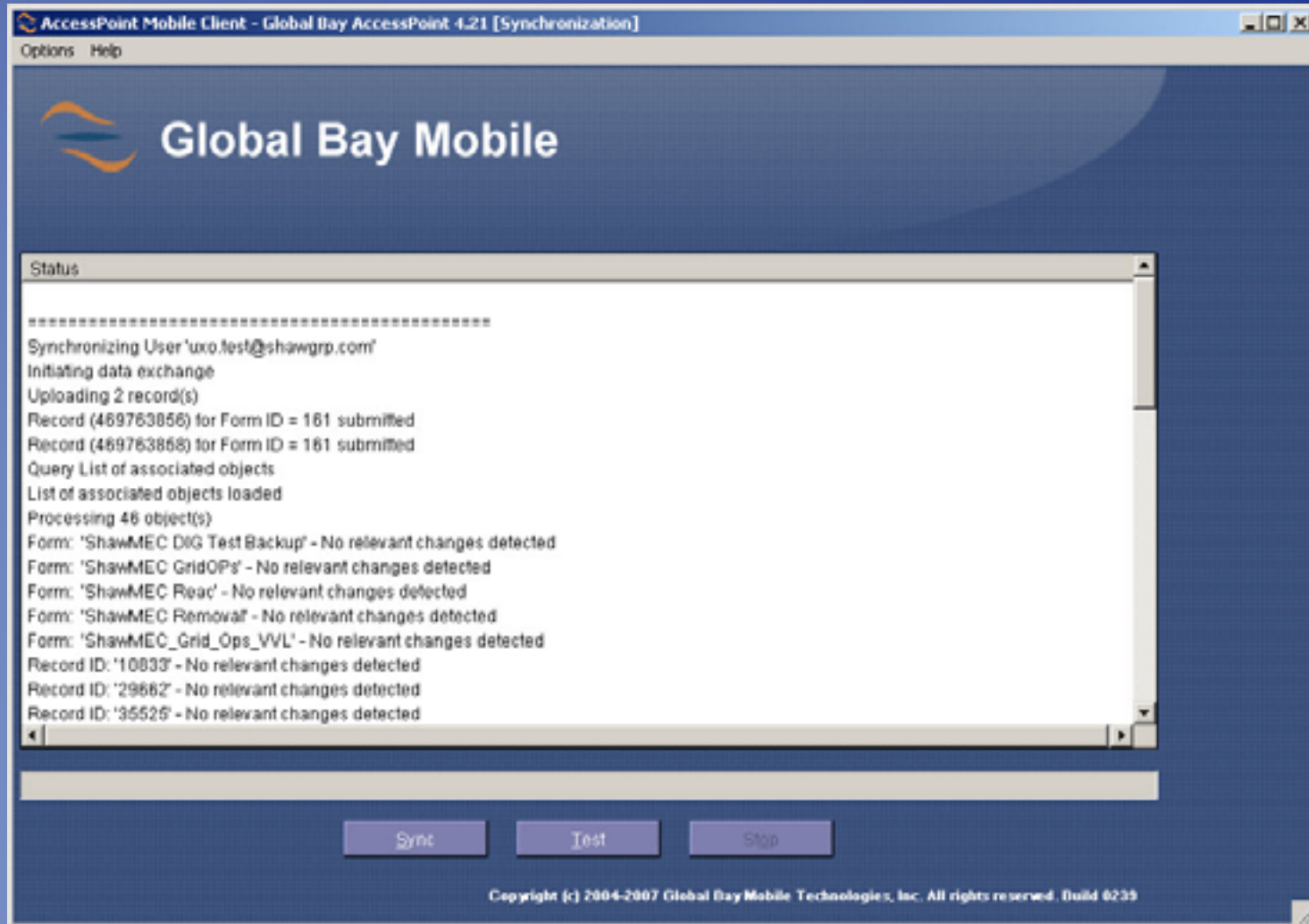
Reac Successful?

# ShawMobile Removal Forms

The image displays three overlapping screenshots of the ShawMobile software interface, which is used for managing mobile equipment removal. The windows are titled "AccessPoint Mobile Client - Global Bay Access...".

- Leftmost window:** Shows the "ShawMEC Removal" screen. It features a "Shaw" logo and the text "Shaw Environmental & Infrastructure". The main heading is "ShawMEC Removal". Below this are several buttons: "Enter", "Backup", "Exit", and "Version: 02.30.10".
- Middle window:** Shows a multi-page form with fields for "Grid" (AA16), "Anomaly" (2), and page navigation (Page 1, Page 2, Page 3, Page 4). The form includes several dropdown menus: "PIT?" (N), "Removal Result" (MEC-DMM), "Item Intact?" (Y), "Demo Required?" (Y), "Special Request" (None), "Condition" (Live), and "Disposition" (CP). A "Save and Back" button is at the bottom. A dropdown menu is open under "Disposition", listing options: CP, BIP, LIP, QC Personnel, and Scrap Bin.
- Rightmost window:** Shows a configuration screen for the mobile client. It includes fields for "COM2:" (Select a COM Port) and "9600" (Select a Baud Rate). There are "Start" and "Stop" buttons for "GPS Connection". Below these are input fields for "Latitude:", "Longitude:", and "Quality:", with an "Enter" button. At the bottom, there are sections for "Successful Attempts:", "Failed Attempts:", "GPS Proc.:", and "GPS Port:", along with a "Back" button.

# ShawMobile Sync Screen



# ShawMEC – Challenges

- **Project Management (cost vs. savings)**
- **Field Work Planning**
- **Resistance to Technology**
- **Requirements of various programs**

# ShawMEC – Recent Enhancements

- Additional flexibility to unassign/reassign grids or transects
  - Support “two-team” approach to surface clearance
- ArcGIS Server web mapping
  - Grid/team assignments through ArcGIS Server map
- Additional web reporting/USACE deliverable formatting
- Additional flexibility in data flow to better accommodate Remedial Investigation projects
- Team Leader Log
- Additional functionality in desktop for info management



**Shaw** The Shaw Group Inc.

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