

SERDP and ESTCP Webinar Series

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The webinar will begin promptly at
12:00 pm ET, 9:00 am PT



SERDP and ESTCP Webinar Series

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- You have two options for accessing the webinar
 1. Listen to the broadcast audio if your computer is equipped with speakers
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Required conference ID: 6102000
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SERDP and ESTCP Webinar Series

“Quality Assurance Project Plan (QAPP) for Geophysical Classification Investigations – Part 2”

June 16, 2016



SERDP and ESTCP Webinar Series

Welcome and Introductions

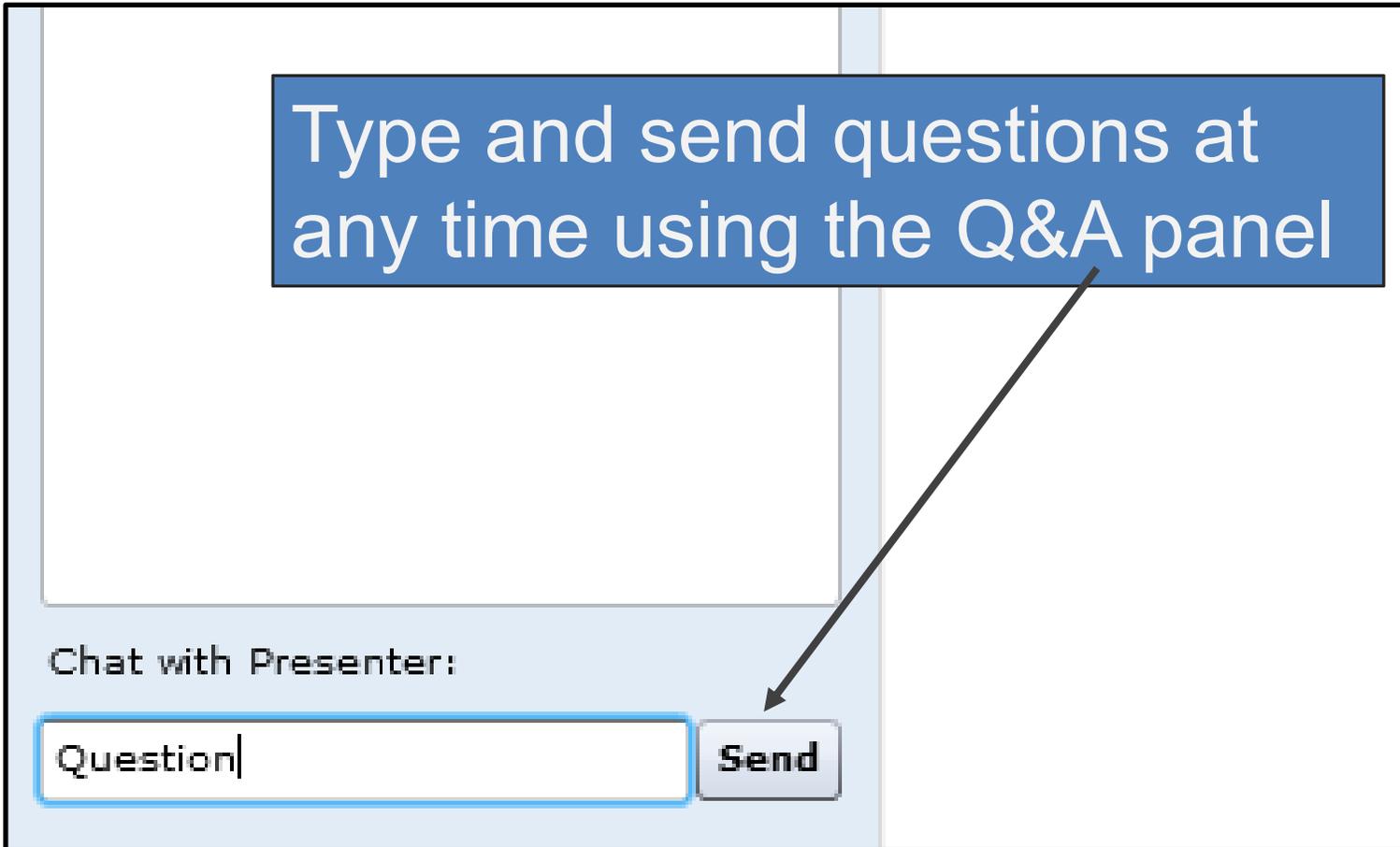
Rula A. Deeb, Ph.D.
Webinar Coordinator



Agenda

- **Webinar Logistics** (5 minutes)
Dr. Rula Deeb, Geosyntec Consultants
- **Overview of SERDP and ESTCP** (5 minutes)
Dr. Herb Nelson, SERDP and ESTCP
- **Quality Assurance Project Plan (QAPP) for Advanced Geophysical Classification Investigations – Part 2** (50 minutes)
Dr. Jordan Adelson, Navy Laboratory Quality and Accreditation Office
Dr. William (Ed) Corl, Navy Laboratory Quality and Accreditation Office
- **Final Q&A session**

How to Ask Questions



Type and send questions at any time using the Q&A panel

Chat with Presenter:

Question|

The image shows a screenshot of a Q&A panel interface. A large blue callout box with white text is positioned at the top, stating 'Type and send questions at any time using the Q&A panel'. Below this, the interface includes a text input field containing the placeholder text 'Question|' and a 'Send' button. A black arrow points from the bottom right corner of the callout box to the 'Send' button.

In Case of Technical Difficulties

- Delays in the broadcast audio
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- Submit a question using the chat box

SERDP and ESTCP Overview

Herb Nelson, Ph.D.
Munitions Response Program
Manager



SERDP

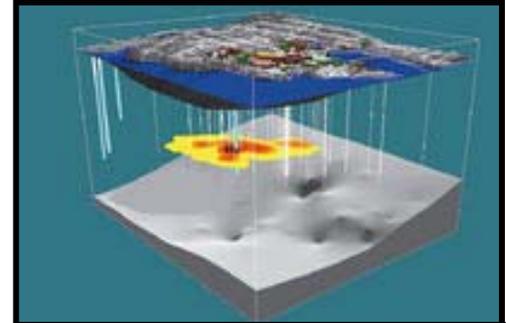
- Strategic Environmental Research and Development Program
- Established by Congress in FY 1991
 - DoD, DOE and EPA partnership
- SERDP is a requirements driven program which identifies high-priority environmental science and technology investment opportunities that address DoD requirements
 - Advanced technology development to address near term needs
 - Fundamental research to impact real world environmental management

ESTCP

- Environmental Security Technology Certification Program
- Demonstrate innovative cost-effective environmental and energy technologies
 - Capitalize on past investments
 - Transition technology out of the lab
- Promote implementation
 - Facilitate regulatory acceptance

Program Areas

1. Energy and water
2. Environmental restoration
3. Munitions response
4. Resource conservation and climate change
5. Weapons systems and platforms



Munition Response

- Munitions on land
 - Classification
- Munitions underwater
 - Wide area and detailed surveys
 - Cost-effective recovery and disposal
 - Characteristics of munitions underwater, their environment and mobility



SERDP and ESTCP Webinar Series

Date	Topic
June 30, 2016	Geophysics 101: Realistic Expectations for Geophysics When Used for Site Characterization and Remediation Monitoring – Part 1
July 14, 2016	Remote Methods for Water Conservation
July 28, 2016	An Environmentally Acceptable Alternative for Fast Cook-off Testing, Demonstration, Validation and Implementation Efforts
August 11, 2016	TBD
August 25, 2016	Geophysics 101: Realistic Expectations for Geophysics When Used for Site Characterization and Remediation Monitoring – Part 2

SERDP and ESTCP Webinar Series

<http://serdp-estcp.org/Tools-and-Training/Webinar-Series>



SERDP and ESTCP Webinar Series

“Advanced Geophysical Classification for Munitions Response Quality Assurance Project Plan Template”



Jordan Adelson, Ph.D.
Navy Laboratory Quality and
Accreditation Office (LQAO)



William (Ed) Corl, Ph.D.
Navy Laboratory Quality and
Accreditation Office (LQAO)



Agenda

- Part 1
 1. Introduction
 2. Planning
 3. Project organization and personnel
- **Part 2**
 4. **Data review**
 5. **Data management and assessments**
 6. **Conclusions**

4. DATA REVIEW

William (Ed) Corl, Ph.D.
Navy Laboratory Quality and
Accreditation Office (LQAO)



Data Review

- Data verification
- Data validation
- Process validation
- Data usability assessment

WS34-37: Data Review

- Data verification
 - Review for completeness
- Data validation
 - Review for compliance with stated requirements
- Data usability assessment (DUA)
 - Assess results against MPCs (WS12) to determine whether overall study objectives have been met, and data can be used as intended

WS34: Data Verification, Validation and Usability Inputs

- Data verification
 - Completeness check that all specified activities have been completed and documented
 - Check that necessary records are available to proceed to data validation
- Data validation
 - Evaluate conformance to stated requirements (e.g., QAPP, contract, SOPs)
- WS34 lists inputs to data verification, validation, and usability assessment
 - Requirements documents
 - Field records (both hard-copy and electronic)
 - Interim and final reports

WS34: Data Verification, Validation and Usability Inputs

Item	Description	Verification (completeness)	Validation (conformance to specifications)	Usability (achievement of DQOs and MPCs)
Field Records				
	QC Seeding Records	X	X	
	Surface Sweep Seeding QC Checklist	X	X	
	Production Area Seeding QC Checklist	X	X	
	Field logbooks	X		
	Photographs	X		
	Instrument Assembly Checklist (Detection Survey)	X	X	
	Sensor Function Test Results (Detection Survey)	X	X	

WS35: Data Verification and Validation Procedures

- Documents procedures that will be used to verify and validate project data
- Data verification is a completeness check to confirm that all required activities were conducted, all specified records are present, and the contents of the records are complete
- Data validation is the evaluation of conformance to stated requirements
 - Some examples are provided in blue text; however, this is not a comprehensive list

WS35: Data Verification and Validation Procedures

Responsible Person	Activity and Records Reviewed	Specifications	Process Description/Frequency	Documentation
Project Geophysicist	Field logbook/ electronic files	QAPP	All information is complete for each day of field activities. Any changes/ exceptions are documented and have been reported in accordance with requirements. Required signatures are present	Daily QC Report
	Instrument Assembly	SOP <u>X</u>	Instrument Assembly has completed according to SOP <u>X</u> . MQOs have been achieved, with any exceptions noted. If appropriate, corrective actions have been completed. Signatures and dates are present	SOP <u>X</u> Checklist Daily QC Report
	Initial IVS Survey	SOP <u>X</u>	Initial IVS Survey has been conducted according to SOP <u>X</u> . Checklist <u>X</u> has been completed. All specifications have been achieved, or exceptions noted. If appropriate, corrective actions have been completed. Signatures and dates are present	SOP <u>X</u> Checklist Daily QC Report

WS36: Geophysical Classification Process Validation

- Document procedures implemented at site to validate the overall anomaly detection and classification approach
- Add confidence in sample design abilities
 - Select anomalies that meet project-specific detection threshold for further investigation
 - Correctly classify anomalies to distinguish between TOI and non-TOI

WS36: Geophysical Classification Process Validation

- Test the anomaly detection threshold and classification process
 - Place “blind” validation and QC seeds at the site before the project begins
 - Confirm seeds are detected and correctly classified
 - Conduct “threshold verification digs”* to verify selection of the appropriate threshold
 - Conduct and evaluate validation digs (excavation of randomly selected non-TOI)
 - Confirm that predicted non-TOI are, in fact, non-TOI
 - Confirm the qualitative basis for classification as non-TOI

WS37: Data Usability Assessment (DUA)

- A qualitative and quantitative evaluation of environmental data against the DQOs and MPCs to determine whether the project data are of the right type, quality and quantity to support the decisions that need to be made
- The DUA evaluates whether
 - Sources of uncertainty have been managed appropriately
 - Data are representative of the population of interest
 - Underlying assumptions are supported
 - Results can be used as intended with an acceptable level of confidence

WS37: DUA

- Identifies personnel (organization and position/title) responsible for participating in DUA
 - DoD RPM
 - Project manager
 - Project quality assurance manager
 - Project geophysicist
 - QC geophysicist
 - Field geophysicist (Lead)
 - Stakeholders

WS37: DUA Inputs (Examples)

- Quality assurance project plan
- Contract specifications
- Quality assurance surveillance plan
- Weekly QC reports
- Assessment reports
- Corrective action reports
- Detection survey validation report
- Cued survey validation report
- Prioritized “dig” list
- Validation dig report

WS37: DUA Process

<p>Step 1</p>	<p>Review the project's objectives and sampling design</p> <ul style="list-style-type: none"> ▪ Review the data quality objectives. Are underlying assumptions valid? Were the project boundaries appropriate? ▪ Review the sampling design as implemented for consistency with stated objectives. Were sources of uncertainty accounted for and appropriately managed? ▪ Summarize any deviations from the planned sample design
<p>Step 2</p>	<p>Review the data verification/validation outputs and evaluate conformance to MPCs documented on Worksheet #12</p> <ul style="list-style-type: none"> ▪ Review the site-specific project library for completeness ▪ Review available QA/QC reports, including weekly QC reports, assessment reports, corrective action reports, and the data verification/validation reports ▪ Evaluate the implications of unacceptable QC results ▪ Evaluate conformance to MPCs documented on Worksheet #12 ▪ Summarize the impacts of non-conformances on data usability

WS37: DUA Process

Step 3	Document data usability, update the CSM, and draw conclusions <ul style="list-style-type: none">▪ Determine if the data can be used as intended, considering implications of deviations and corrective actions▪ Assess the performance of the sampling design and Identify any limitations on data use▪ Update the conceptual site model and document conclusions
Step 4	Document lessons learned and make recommendations <ul style="list-style-type: none">▪ Summarize lessons learned and make recommendations for changes to DQOs or the sampling design for future similar studies▪ Prepare the data usability summary report

Summary

- Data verification
 - Check that all specified activities have been completed and documented and necessary records are available
- Data validation
 - Evaluate conformance to stated requirements (e.g., QAPP, contract, SOPs)
- Data usability assessment
 - Evaluate (qualitative and quantitative) environmental data against the DQOs and MPCs
 - Determine whether project data are the right type, quality and quantity needed to support decisions

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Q&A Session 1



5. DATA MANAGEMENT AND ASSESSMENTS

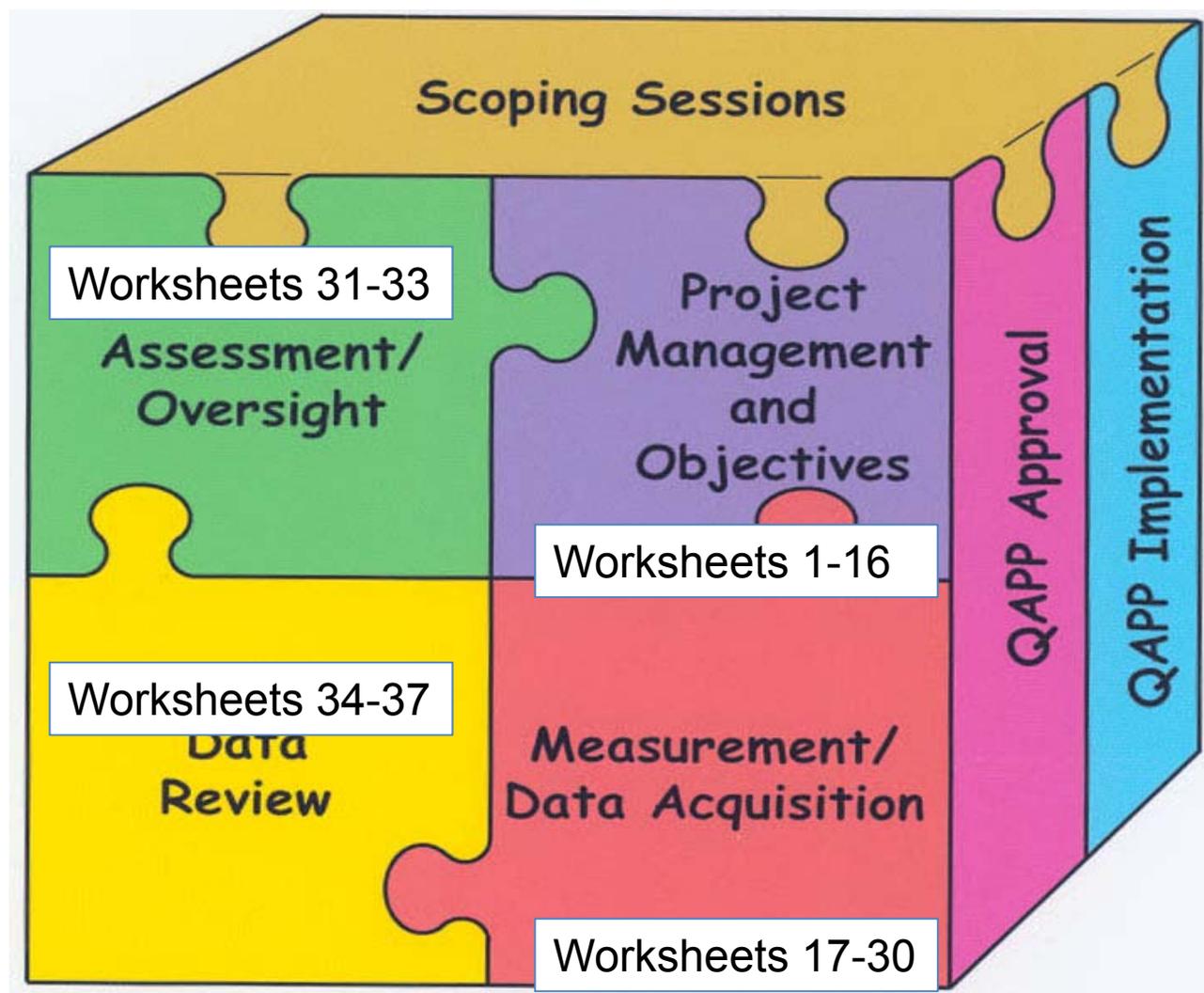
Jordan Adelson, Ph.D.
Navy Laboratory Quality and
Accreditation Office (LQAO)



Data Management and Assessments

- Relevant worksheets
 - WS13: Secondary data uses and limitations
 - WS29: Project documents and records
 - WS31/32/33: Assessments and corrective actions
- Objectives
 - Discuss other pertinent data
 - Identify primary records and documents
 - Identify assessments and corrective actions

Data Management and Assessments



WS13: Secondary Data Uses and Limitations

- What are secondary data?
 - Data generated for purposes other than this specific project or data pertinent to this project (generated under a separate QAPP)
- Why is this important?
 - DQOs! Evaluate the data being considered to ensure they are of the type and quality necessary to support their intended uses

WS13: Secondary Data Uses and Limitations

- Examples of secondary data
 - Data generated from previous investigations
 - Related published literature
 - Meteorological data
 - Interviews
 - Photographs
 - Historical data
 - Internal/external, qualitative/quantitative

WS13: Secondary Data Uses and Limitations (Table 13-1)

Data Type	Source	Data Uses Relative to Current Project	Factors Affecting Data Reliability and Limitations on Data Use
Infrastructure locations			
Range history			
Munitions use and disposal			

WS13: Secondary Data Uses and Limitations

- How do we assess limitations?
 - Credible source(s)?
 - When collected and by whom?
 - Previous DQOs match current needs?
 - Consistent with CSM?
 - Discussed/agreed during planning

WS29: Data Management, Project Documents and Records

- Provides minimum specifications for all data management tasks and deliverables
- Provides procedures for controlling documents, records and databases
- Purpose
 - Ensure data completeness, data integrity, traceability and ease of retrieval

WS29: Data Management, Project Documents and Records

This worksheet provides 1) minimum specifications for all data management tasks and deliverables, and 2) procedures for controlling project documents, records, and databases. Where applicable, specific versions or dates of software used should be documented. Its purpose is to ensure data completeness, data integrity, traceability and ease of retrieval.

Part 1: Data Management Specifications

Computer Files and Digital Data: All final document files, including reports, figures, and tables, will be submitted in electronic format on CD-ROM or as specified by the DoD client. Data management and backup must be performed in accordance with the contractor's documented quality system.

TOI Library: This worksheet must document the version (date) of the DoD TOI library used and describe or reference procedures to be used to update the library. The TOI library used must be included in data deliverables.

Part 2: Control of Documents, Records, and Databases

Table 29-1: Minimum Required Documents and Records

Document/Record	Purpose	Completion/ Update Frequency	Format/ Storage Location/ Archive Requirements
Site Manager Log			
Quality Control (QC) Seed Plan			
QC Firewall Plan			

WS 31/32/33: Assessments and Corrective Actions

- Documents responsibilities and procedures through each phase of the project
 - Conducting and documenting project assessments
 - Responding to assessment findings
 - Implementing corrective action

WS 31/32/33: Assessments and Corrective Actions

- Identify problems early to prevent negative impact on DQOs and MPCs

This worksheet is used to document responsibilities and procedures for conducting project assessments, documenting assessments, responding to assessment findings, and implementing corrective action. Appropriately scheduled assessments during each group of related project activities allow management to identify problems while the activities are being implemented, thereby allowing processes to be corrected before they have a negative impact on the achievement of DQOs and MPCs. This worksheet should reference assessment checklists and include them in an appendix to the QAPP.

For this project, related activities are grouped as follows:

1. Site preparation (DFW 1-2)
2. Detection survey (DFW 3-5)
3. Cued survey (DFW 6-10)
4. Intrusive investigation (DFW 11-13)

Table 31-1: Assessment Schedule

Assessment Type	Responsible Party	Schedule/Frequency	Assessment Deliverable	Deliverable due date
Site Preparation Preparatory phase			Preparatory Phase Inspection Checklist	
Site Preparation Initial phase			Initial Phase Inspection Checklist	
Site Preparation Follow-up phase			Follow-up Phase Inspection Checklist	
Detection Survey Preparatory phase				
Detection Survey Initial phase				
Detection Survey Follow-up phase				
Cued Survey Preparatory phase				
Cued Survey Initial phase				
Cued Survey Follow-up phase				
Intrusive Investigation Preparatory phase				
Intrusive Investigation				

Table 31-2: Assessment Response and Corrective Action

Assessment Type (All Phases)	Responsibility for Responding to Assessment Findings	Assessment Response Documentation	Timeframe for Response	Responsibility for Implementing Corrective Action	Responsible for Monitoring Implementation
Site preparation					
Detection survey					
Cued survey					
Intrusive investigation					

Summary

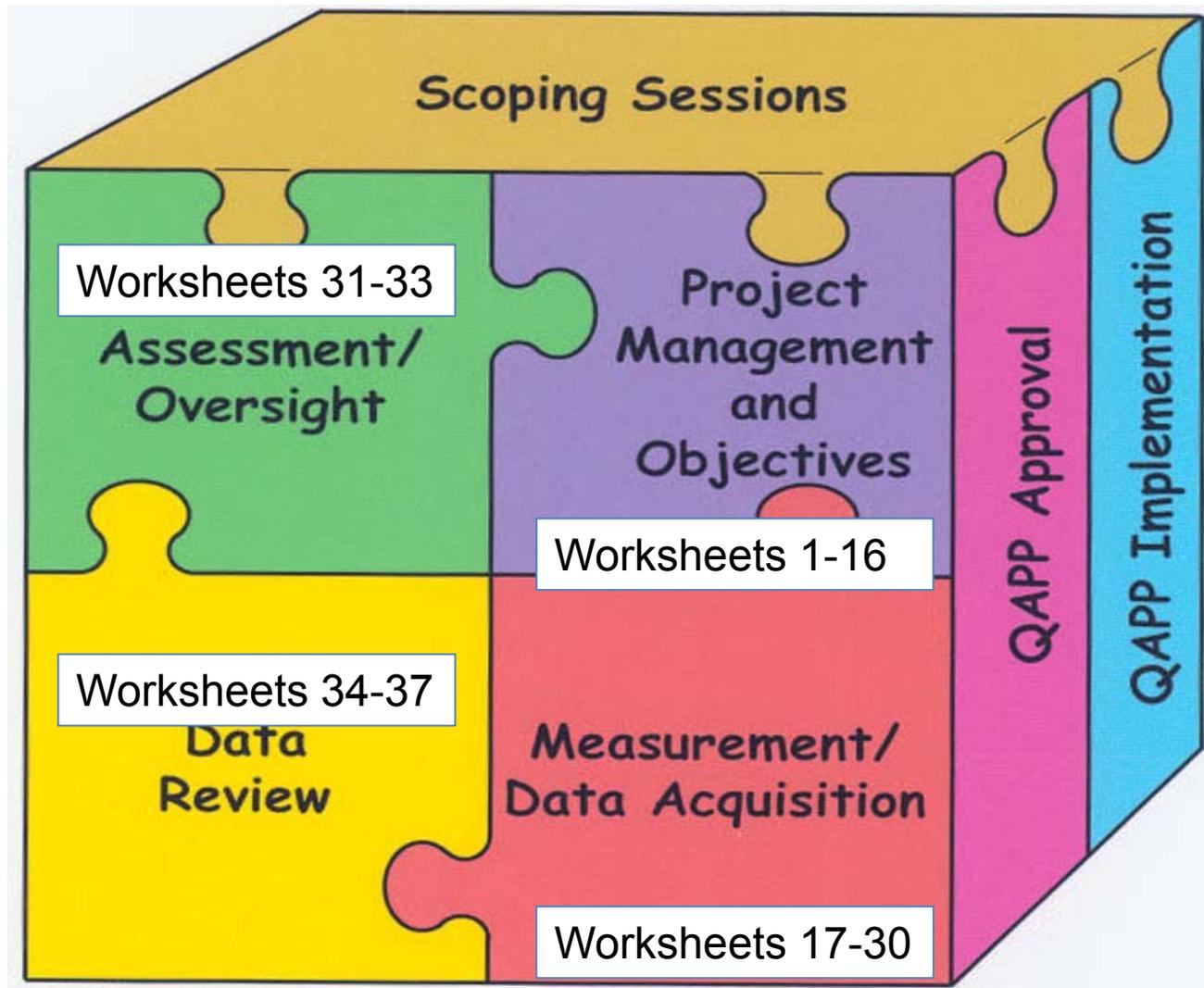
- Well-developed and integrated procedures for data management and assessments ensure the following
 - Data completeness
 - Data integrity
 - Measurement traceability
 - Ease of retrieval

6. CONCLUSIONS

Jordan Adelson, Ph.D.
Navy Laboratory Quality and
Accreditation Office (LQAO)



Conclusions



AGCMR-QAPP Template Features

- Includes “crosswalk table” identifying where required quality system elements are addressed
 - Green text provides instructions and guidance for completing each worksheet
 - Blue text provides examples of the type of information needed
 - Black text identifies minimum recommended requirements (where applicable)
- Template is based on the RA phase of investigation
- Project teams should modify as needed for other phases

AGCMR-QAPP Template Features

- Problem formulation documentation
- Key personnel, roles and communication pathways
- Identifies what data are needed and quality
- Limitations
- Procedures for work and review
- Reports and deliverables
- Assessments and corrective actions
- Verification and validation
- Ultimate data usability

AGCMR-QAPP Summary

- AGCMR-QAPP template is a planning and documentation tool
- Upfront project planning is critical
 - CSM (WS10)
 - DQOs (WS11)
 - Meetings (WS9)
 - Worksheet completion is an iterative process
 - Must include regulatory partners
 - Facilitates regulatory review and minimizes re-work

Project goals
Objectives
Schedules
Resources

Systematic Planning and Decision-Making

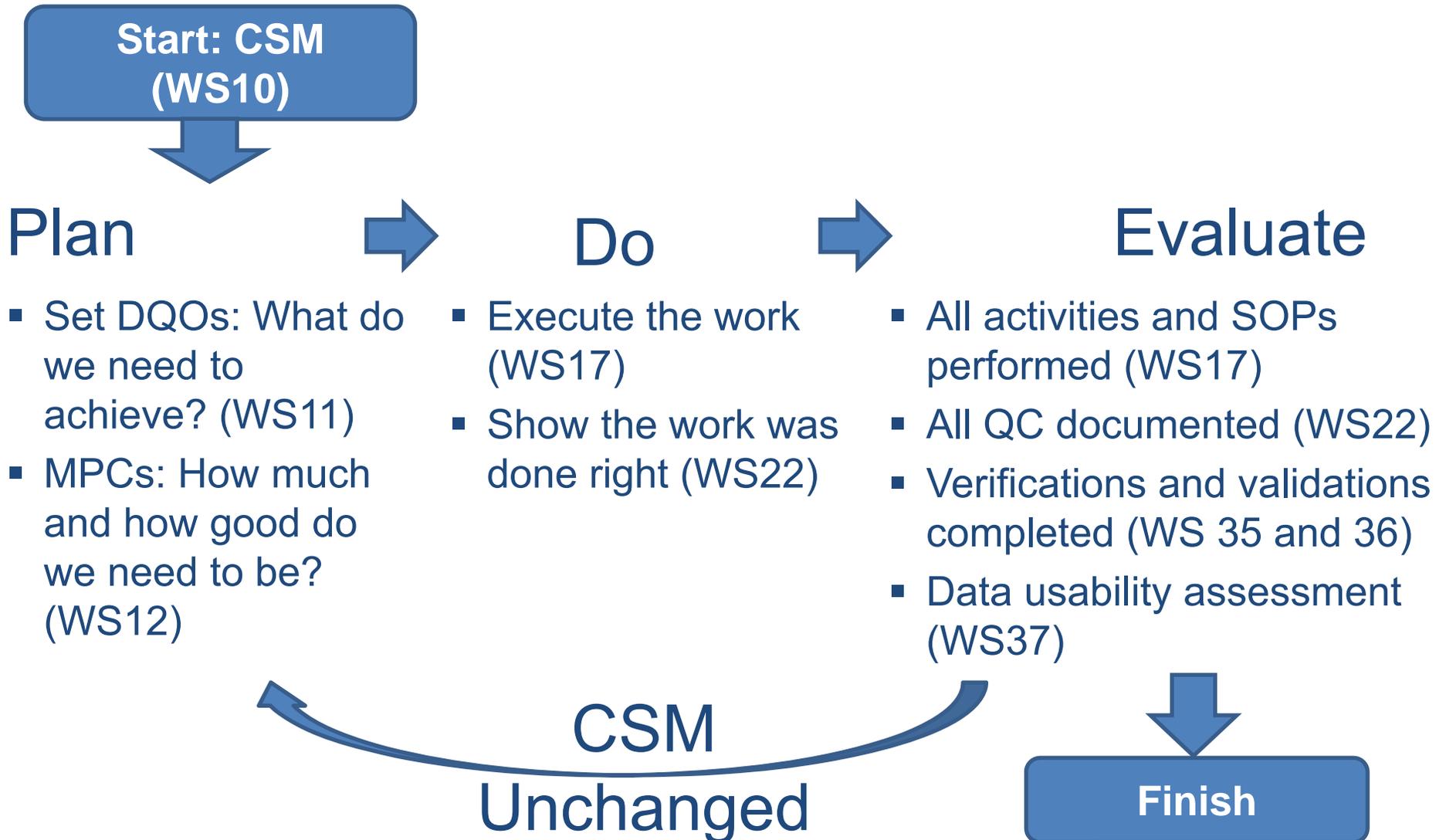
- If you can't agree on the problem and objectives, then reaching agreement on a solution is not likely



Conclusions

- WS 12 and 22
 - Precision
 - Accuracy
 - Representativeness
 - Comparability
 - Completeness
 - Sensitivity
- QC and validation seeds have a significant role in QA and QC
 - Detection
 - Classification

Conclusions



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For additional information, please visit
<https://www.serdp-estcp.org/Program-Areas/Munitions-Response>

Speaker Contact Information

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SERDP and ESTCP Webinar Series

Q&A Session 2



SERDP and ESTCP Webinar Series

The next webinar is on
June 30, 2016

“Geophysics 101: Realistic Expectations for
Geophysics When Used for Site
Characterization and Remediation
Monitoring – Part 1”



Survey Reminder

Please take a moment to complete the survey that will pop up on your screen when the webinar ends



List of Acronyms

- A: Ampere
- A/E/C: Architecture, Engineering, and Construction
- AGC-QAPP: Advanced Geophysical Classification Quality Assurance Project Plan
- bgs: Below Ground Surface
- CA: Corrective Action
- CAR: Corrective Action Request
- CSM: Conceptual Site Model
- DDESB: Department of Defense Explosives Safety Board
- DFW: Definable Feature of Work
- DGM: Digital Geophysical Mapping
- DMM: Discarded Military Munitions
- DoD: Department of Defense
- DQI: Data Quality Indicator
- DQO: Data Quality Objective
- DUA: Data Usability Assessment
- EMI: Electromagnetic Induction

List of Acronyms (Cont'd)

- EPA: U.S. Environmental Protection Agency
- ESRI: Environmental System Research Institute
- ESTCP: Environmental Security Technology Certification Program
- FUDS: Formerly Used Defense Sites
- GIS: Geographic Information System
- GPS: Global Positioning System
- HAZWOPER: Hazardous Waste Operations and Emergency Response
- IDQTF: Intergovernmental Data Quality Task Force
- IMU: Inertial Measurement Unit
- ISO: Industry Standard Object
- ISO 80: Schedule 80 small Industry Standard Object
- ISO/IEC: International Organization for Standardization/International Electrotechnical Commission
- ITRC: Interstate Technology Regulatory Council
- IVS: Instrument Verification Strip
- MC: Munitions Constituents
- MEC: Munitions and Explosives of Concern

List of Acronyms (Cont'd)

- MPC: Measurement Performance Criteria
- MQO: Measurement Quality Objective
- PA: Preliminary Assessment
- pdf: Portable document format
- PM: Project Manager
- QA: Quality Assurance
- QC: Quality Control
- QAPP: Quality Assurance Project Plan
- RA: Remedial Action
- RCA: Root Cause Analysis
- RI/FS: Remedial Investigation/Feasibility Study
- RPM: Remedial Project Manager
- SDSFIE: Spatial Data Standards for Facilities, Infrastructure, and Environment
- SI: Site Inspection
- SNR: Signal to noise ratio
- SOP: Standard operating procedure

List of Acronyms (Cont'd)

- SPP: Systematic Planning Process
- SUXOS: Senior UXO Supervisor
- TBD: To be determined
- TPP: Technical Project Planning
- TOI: Target of Interest
- Tx/Rx: Transmit/receive
- UFP QAPP: Uniform Federal Policy for Quality Assurance Project Plans
- USACE: U.S. Army Corps of Engineers
- UXO: Unexploded Ordnance
- UXOQCS: Unexploded Ordnance Quality Control Specialist
- UXOSO: Unexploded Ordnance Safety Officer