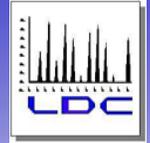


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Performing Automated Data Review and Data Quality Assessment on SEDD Files

DoD Environmental Monitoring and Data Quality Workshop

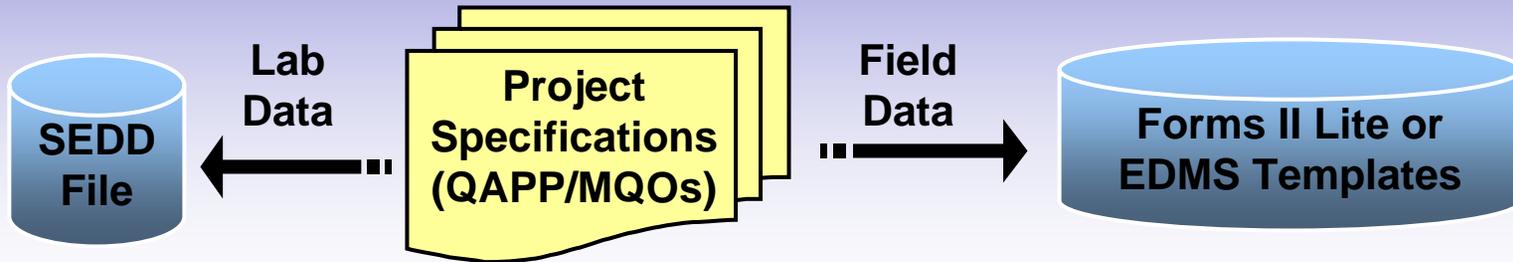
May 12, 2004

*Scott Denzer - Laboratory Data Consultants, Inc.
Pamela Wehrmann - USACE, Sacramento District*

Electronic Data Flow

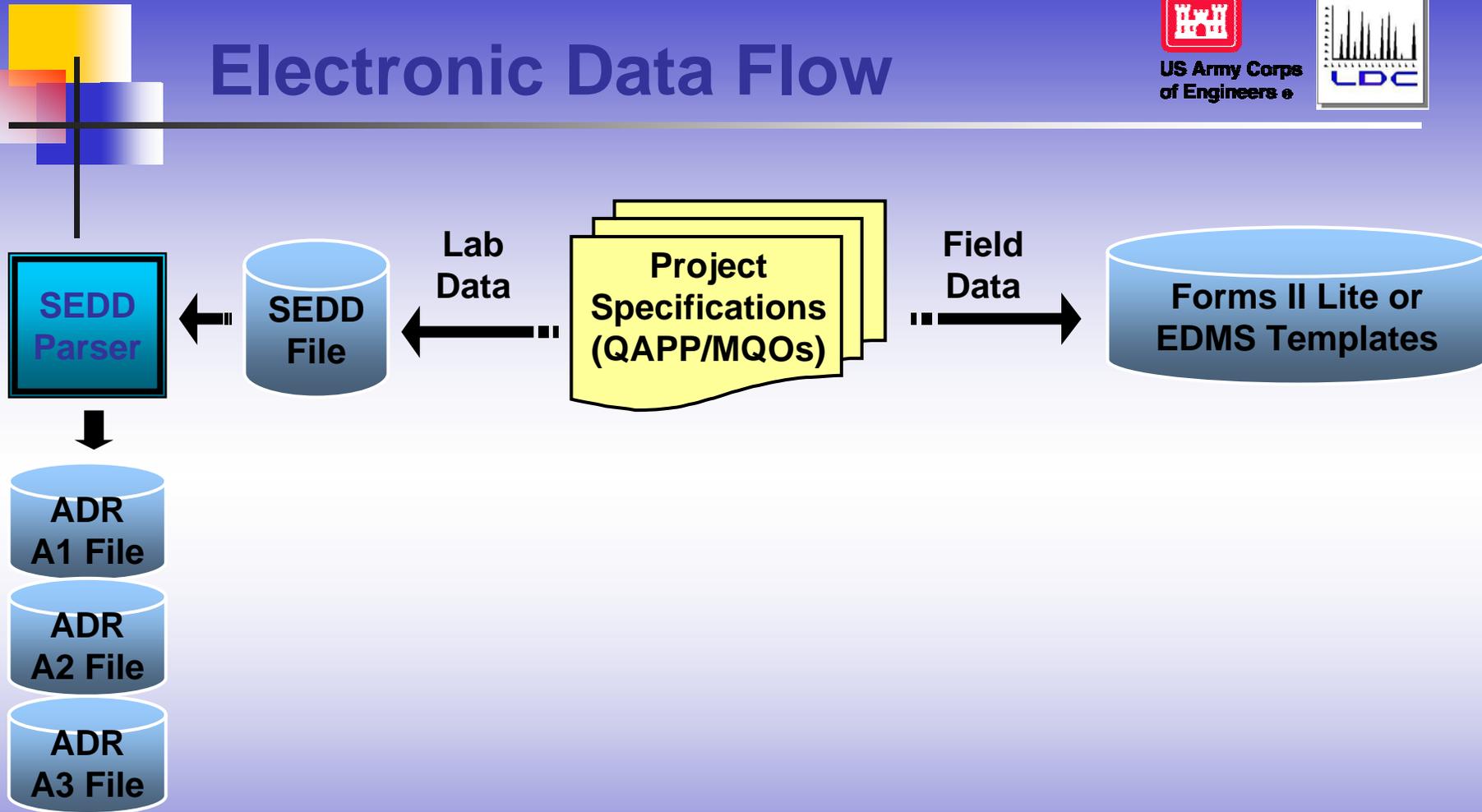


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Data Collection

Electronic Data Flow

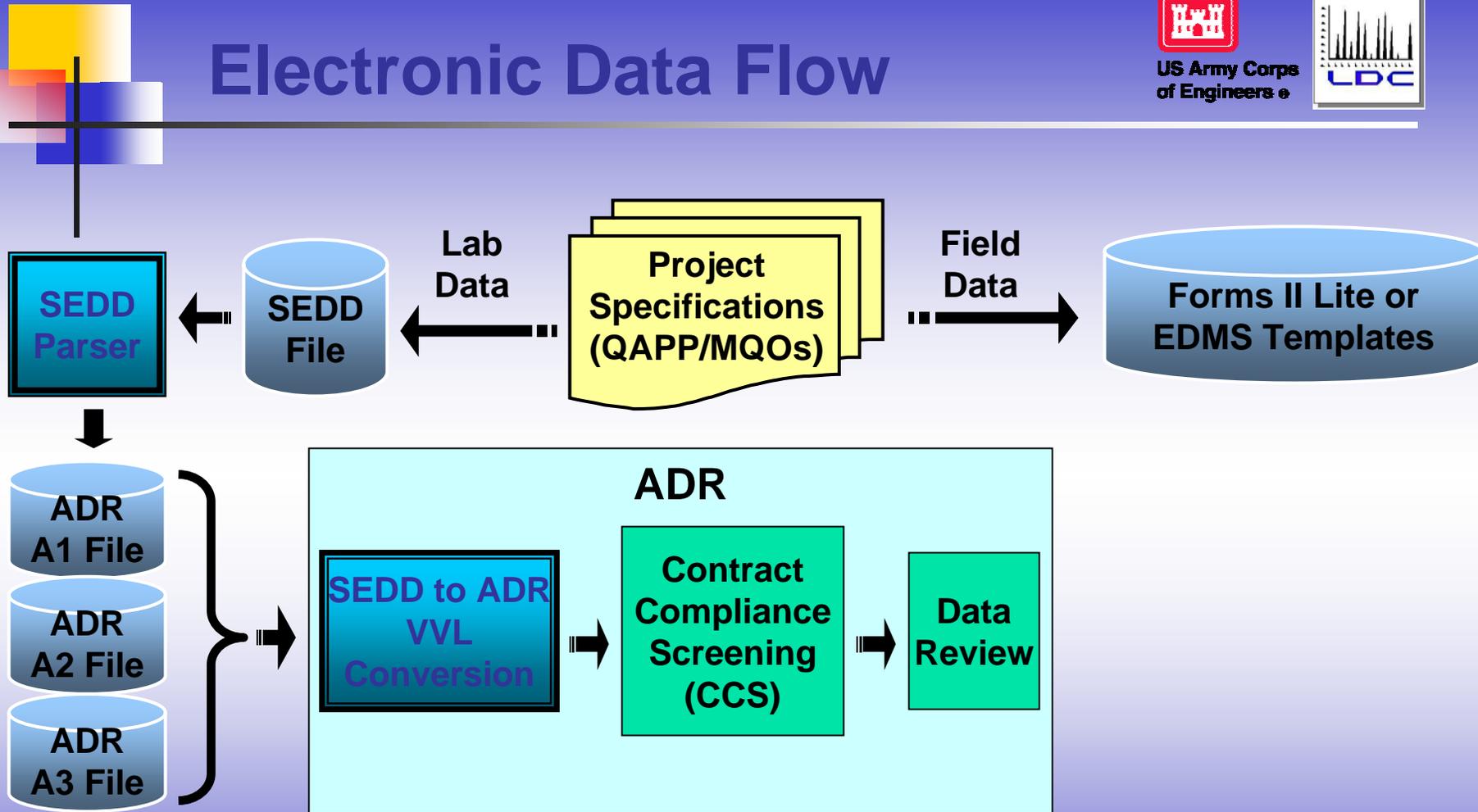


Data Parsing

Electronic Data Flow

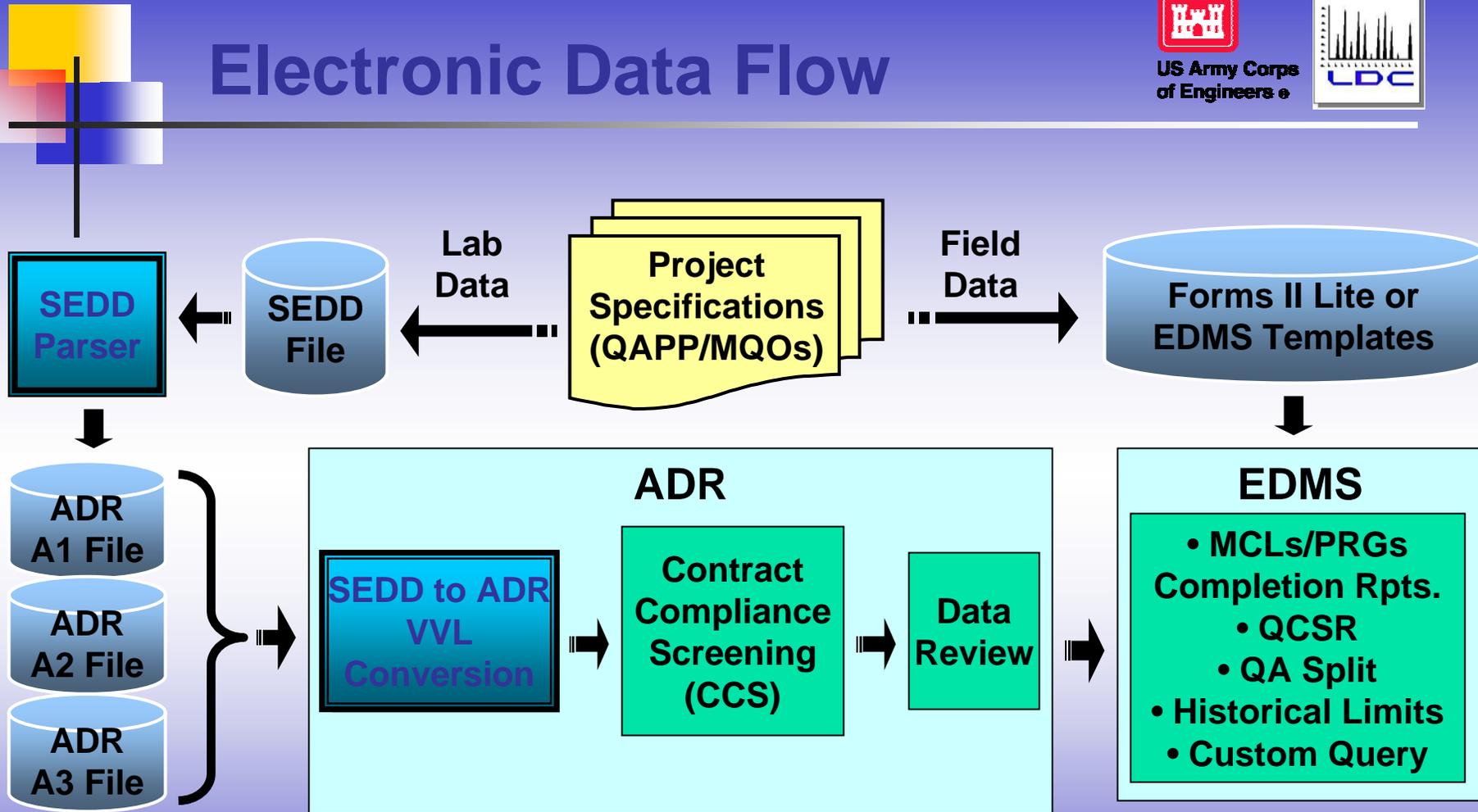


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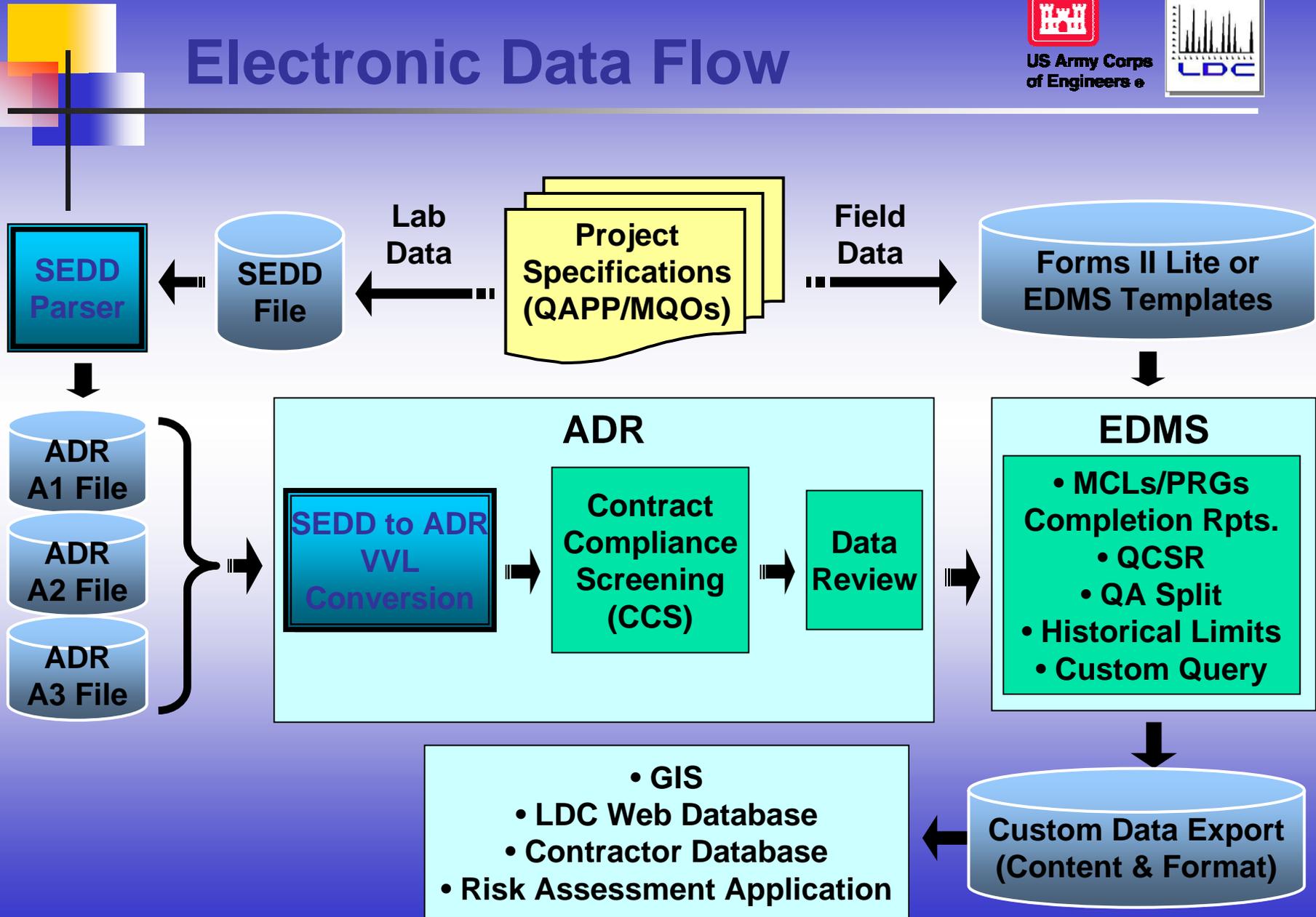
Automated CCS and Data Review

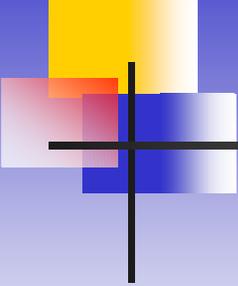
Electronic Data Flow



- Merge with Field Data in EDMS
- Perform Data Quality Assessments
- Query Data

Electronic Data Flow





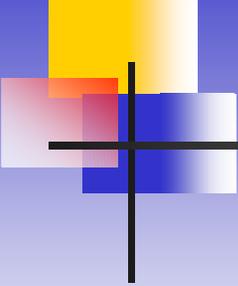
Components in Flow



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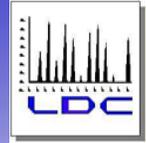
- Forms II Lite
- Staged Electronic Data Deliverable (SEDD)
- SEDD Parser Tool
- Automated Data Review (ADR)
- Environmental Data Management System (EDMS)
- Data Use Applications: GIS, Risk Assessment, etc.



Components in Flow



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Staged Electronic Data Deliverable (SEDD)

- Extensible Markup Language (XML)
- “Stages” designate level of content (2a, 2b, 3)

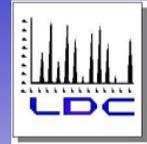
SEDD Parser Tool

- Performs XML validation of SEDD file against SEDD document type definition (DTD)
- Extracts/parses data from SEDD Stage 2a, 2b or 3 file into ADR format

SEDD File



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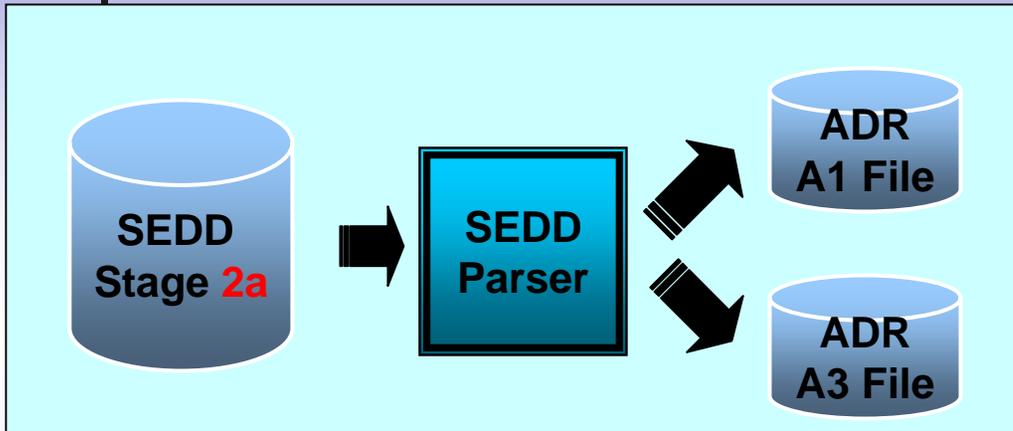
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<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE Header SYSTEM "VOAMS_2a_1.DTD">
<Header>
  <EDD_ID>SEDD</EDD_ID>
  <EDD_Version>2.0</EDD_Version>
  <EDD_Implementation_ID>VOAMS_2a</EDD_Implementation_ID>
  <EDD_Implementation_Version>1</EDD_Implementation_Version>
  <Generating_System_ID>CEERD-EP-C Laboratory ACS LIMS</Generating_System_ID>
  <Generating_System_Version>1.0</Generating_System_Version>
  <Lab_Data_Package_ID></Lab_Data_Package_ID>
  <Lab_Data_Package_Name></Lab_Data_Package_Name>
  <Lab_Data_Package_Version></Lab_Data_Package_Version>
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  <Comment>Generated by LIMS</Comment>
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  <Project_Name>Project XYZ</Project_Name>
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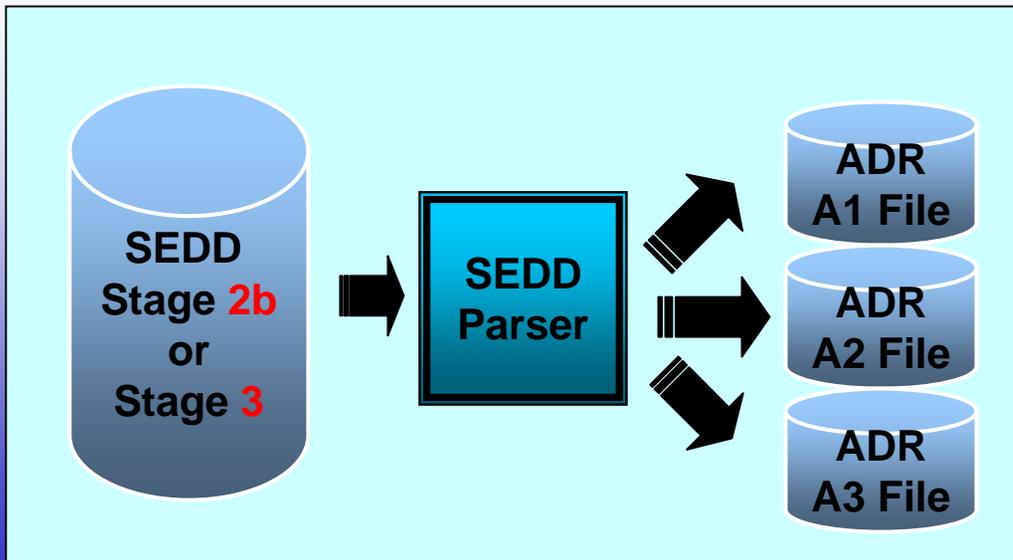
SEDD Parsing



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- Result Information
- Sample Information

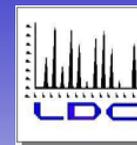


- Result Information
- Calibration Information
- Sample Information

SEDD Parser Tool



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Lab Data XML Parser Tool - Microsoft Internet Explorer

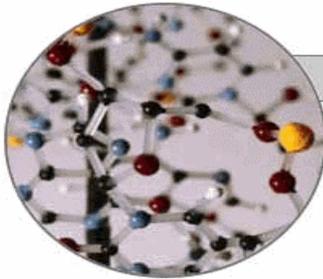
File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites Media History Mail Print Edit Discuss Real.com Messenger

Address http://localhost/labadv_022603A/ Go Links

 <?xml version="1.0" encoding="UTF-8" ?>
<!--Header-->
<EDD_ID:SEDD;/EDD_ID>
<EDD_Version:2.0;/EDD_Version>
<EDD_Implementation_ID:STAGE-3_CLP-VOA;/EDD_Implementation_ID>
<EDD_Implementation_Version:1.0;/EDD_Implementation_Version>
<Generating_System_ID:MANUAL;/Generating_System_ID> **SEDD** **ADR** **PARSER TOOL**

SELECT XML FILE BACK BOTTOM



SEDD Parser Tool

Please select SEDD file to parse:

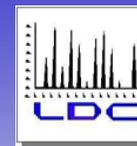
© LDC 2003. [Developed by HCET](#) BACK TOP

Done Local intranet

SEDD Parser Tool Export



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Lab Data XML Parser Tool - Microsoft Internet Explorer

Address: http://localhost/labadv_022603A/DisplayEDDA1.asp

SEDD
PARSER TOOL

SELECT XML FILE BACK BOTTOM

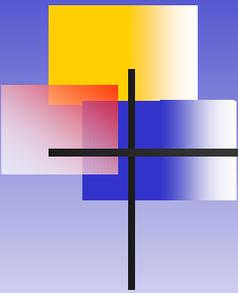
Create Text File Exit

Parsing XML file C:_SEDD_XML Data Files\Stage 2a\6699-SWB46-VOAMS_2a_1.xml

Parsed SEDD Data for A1 Text File

Client Sample ID	Lab Analysis Ref. Method ID	Analysis Type	Lab Sample ID	Lab ID	Client Analyte ID	Analyte Name	Result	Result Units	Lab Qualifiers	Detect
04-ESI-SB04-23-00	EPA 8260	/	M020956-002	CQAB	17060-07-0	1,2-Dichloroethane-d4	99.5	%		
04-ESI-SB04-23-00	EPA 8260	/	M020956-002	CQAB	1868-53-7	Dibromofluoromethane	92.9	%		
04-ESI-SB04-23-00	EPA 8260	/	M020956-002	CQAB	2037-26-5	Toluene-d8	98.8	%		
04-ESI-SB04-23-00	EPA 8260	/	M020956-002	CQAB	460-00-4	4-Bromofluorobenzene	104.	%		
04-ESI-SB04-23-00	EPA 8260	/	M020956-002	CQAB	Ethylbenzene	Ethylbenzene	5.3	ug/kg	u	1.06713
04-ESI-SB04-23-00	EPA 8260	/	M020956-002	CQAB	Styrene	Styrene	5.3	ug/kg	u	1.06713
04-ESI-SB04-23-00	EPA 8260	/	M020956-002	CQAB	cis-1,3-Dichloropropene	cis-1,3-Dichloropropene	5.3	ug/kg	u	1.06713
04-ESI-SB04-23-00	EPA 8260	/	M020956-002	CQAB	trans-1,3-Dichloropropene	trans-1,3-Dichloropropene	5.3	ug/kg	u	1.06713
04-ESI-SB04-23-00	EPA 8260	/	M020956-002	CQAB	n-Propylbenzene	n-Propylbenzene	5.3	ug/kg	u	1.06713
04-ESI-SB04-23-00	EPA 8260	/	M020956-002	CQAB	n-Butylbenzene	n-Butylbenzene	5.3	ug/kg	u	1.06713
04-ESI-SB04-23-00	EPA 8260	/	M020956-002	CQAB	4-Chlorotoluene	4-Chlorotoluene	5.3	ug/kg	u	1.06713
04-ESI-SB04-23-	EPA 8260	/	M020956-002	COAB	1,4-Dichlorobenzene	1,4-Dichlorobenzene	5.3	ug/kg	u	1.06713

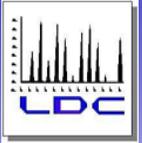
Done Local intranet



Components in Flow



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Automated Data Review (ADR)

- **Laboratory Tool – Allows laboratories to verify EDD completeness and contract compliance**
- **Data Review Tool – Allows data users to perform an automated data review against a project specific library**

Environmental Data Management System (EDMS)

- **Storage and retrieval of reviewed data**
- **Data evaluation and reporting tools**

ADR: Project Libraries



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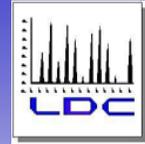
ADR performs automated review of analytical data relative to project requirements



ADR: Project Libraries



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Lab QC data review criteria

Library: AcmeWasteMonitoring Method: 6010B

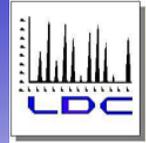
Analyte Name	Client Analyte ID	Reporting Limits			LCS and LCSD Accuracy and Precision Criteria			
		Type	Value	Units	Rejection Point	% Recovery Lower Limit	% Recovery Upper Limit	%RPD/RER
ALUMINIUM	7429-90-5	MRL	10	mg/Kg	50.00	75.00	120.00	35.00
IRON	7439-89-6	MRL	50	mg/Kg	50.00	75.00	120.00	35.00
MAGNESIUM	7439-95-4	MRL	500	mg/Kg	50.00	75.00	120.00	35.00
MANGANESE	7439-96-5	MRL	5	mg/Kg	50.00	75.00	120.00	35.00
NICKEL	7440-02-0	RDL	10	mg/Kg	50.00	75.00	120.00	35.00
POTASSIUM	7440-09-7	RDL	200	mg/Kg	50.00	75.00	120.00	35.00
SODIUM	7440-23-5	RDL	500	mg/Kg	50.00	75.00	120.00	35.00
BARIUM	7440-39-3	RDL	2	mg/Kg	50.00	75.00	120.00	35.00
CHROMIUM	7440-47-3	RDL	10	mg/Kg	50.00	75.00	120.00	35.00
COBALT	7440-48-4	RDL	10	mg/Kg	50.00	75.00	120.00	35.00
COPPER	7440-50-8	RDL	10	mg/Kg	50.00	75.00	120.00	35.00
VANADIUM	7440-62-2	RDL	5	mg/Kg	50.00	75.00	120.00	35.00
ZINC	7440-66-6	RDL	10	mg/Kg	50.00	75.00	120.00	35.00
CALCIUM	7440-70-2	PQL	1000	mg/Kg	50.00	75.00	120.00	35.00

Measurement Quality Objectives

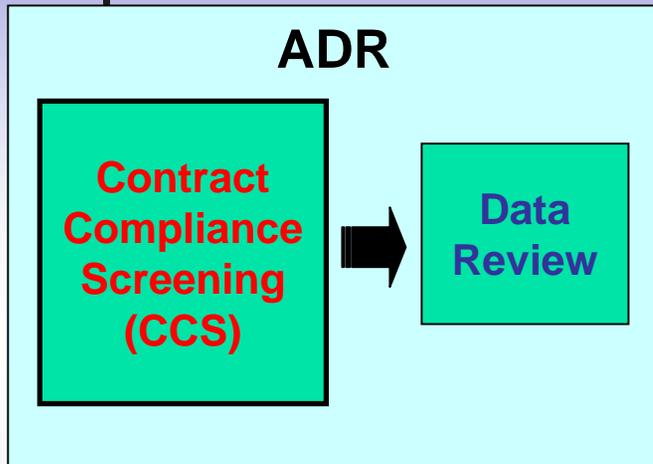
ADR: CCS Check



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... a laboratory tool



Ensures integrity of data imported into project databases

- Integrity check performed relative to project requirements
- Provides detailed non-conformance report
- EDD checked for non-conformances and corrected at the laboratory

ADR: CCS Check

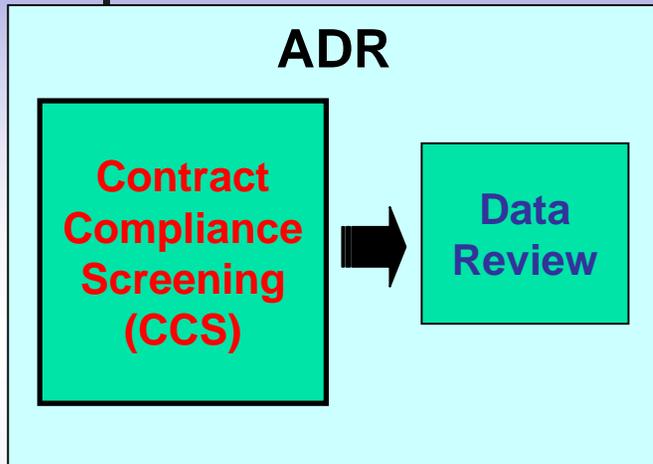


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... a laboratory tool

Comprehensive check of EDD



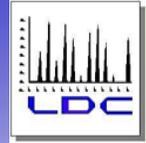
- Data format
- Valid values
- Required fields

- Methods, Analyte Names, CAS #, Units, Reporting Limits
- Correct Spikes and Surrogates
- Logical QC/Sample Batch Linkage

ADR: CCS Check

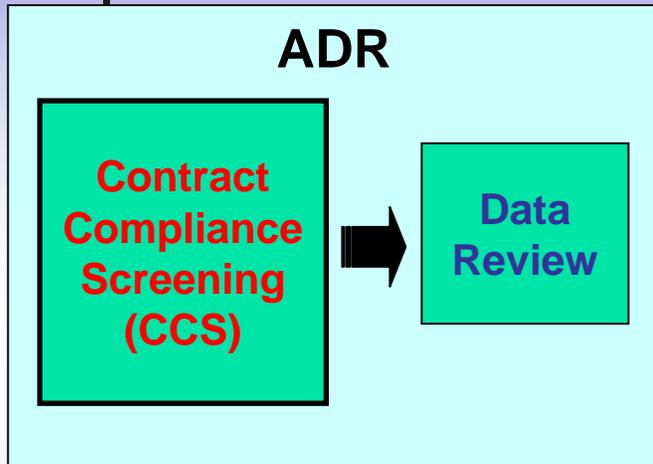


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... a laboratory tool

*Additional checks if
calibration information
included*



- Logical calibration/sample batch linkage
- Calibration records exist for each analyte and method reported in samples
- GC/MS tune records exist for each initial and continuing calibration

ADR: Automated Review

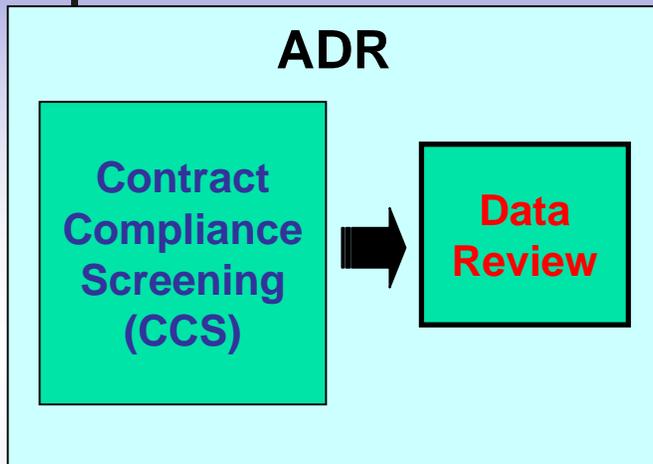


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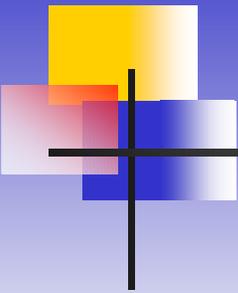


... a data review tool

*Automated data review
performed relative to project
requirements*



- Evaluates lab QC and calibration data against ADR project library
- Applies data review qualifiers
- Performs biased or non-biased data review
- Allows parent or batch sample qualification for MS/MSD outliers



ADR: Automated Review



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... a data review tool

ADR provides a variety of post data review reports

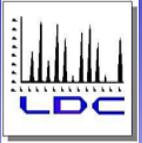
Sample Qualification Reports

- All Results
- All Qualified Results
- All Rejected Results

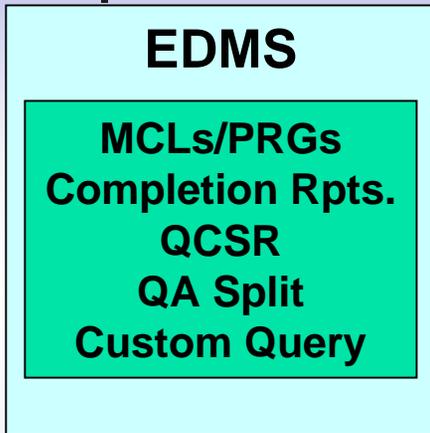
Outlier Reports

Quality Control and
Calibration Outlier
Results with Project
Control Limits, and
Associated Samples

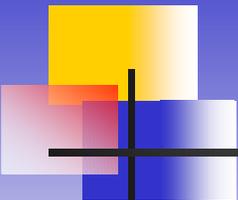
EDMS



Data warehouse and post review assessment of data processed through ADR



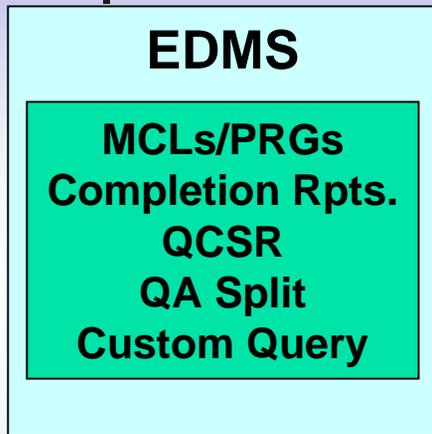
- Import of ADR reviewed data
 - Direct entry or import of field data (Excel templates, Forms II Lite)
 - Generate Project Completion Reports (e.g. Technical Completeness)
 - Plot data in Access 2002
-
- Custom query wizard for view and export of data



EDMS



Data warehouse and post review assessment of data processed through ADR

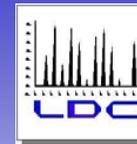


- Generate Quality Control Summary Reports (QCSR, DQAR, CQAR, etc.)
- Compare sample results to historical minimum and maximum levels
- Compare sample results between primary lab and QA split lab
- Compare sample results to regulatory and/or project specific action levels or levels of concern

EDMS: Data Assessment



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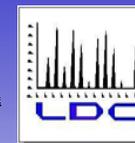
EDMS: MCLs / PRGs Reference Values

Field Information Management	REFERENCE (PRGs and MCLs) Contamination Limit Libraries <table border="1"> <thead> <tr> <th>Library Name</th> <th>Source</th> <th>Matrix</th> <th>Description</th> <th>View Tag</th> </tr> </thead> <tbody> <tr> <td>Ambient Air, 2000</td> <td>EPA Region IX</td> <td>AIR</td> <td>PRG value (EPA Region IX, 2000)</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Industrial Soil, 2000</td> <td>EPA Region IX</td> <td>SO</td> <td>PRG value (EPA Region IX, 2000)</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Residential Soil, 2000</td> <td>EPA Region IX</td> <td>SO</td> <td>PRG value (EPA Region IX, 2000)</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Tap Water, 2000</td> <td>EPA Region IX</td> <td>AQ</td> <td>PRG value (EPA Region IX, 2000)</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>MCL Action Level</td> <td>CA Title 22</td> <td>AQ</td> <td>CA Title 22 MCL, 04/12/1999</td> <td><input type="checkbox"/></td> </tr> <tr> <td>MCL Primary</td> <td>CA Title 22</td> <td>AQ</td> <td>CA Title 22 MCL, 04/12/1999</td> <td><input type="checkbox"/></td> </tr> <tr> <td>MCL Secondary</td> <td>CA Title 22</td> <td>AQ</td> <td>CA Title 22 MCL, 04/12/1999</td> <td><input type="checkbox"/></td> </tr> <tr> <td>STLC</td> <td>CA Title 22</td> <td>AQ</td> <td>CA Title 22 Soluble Threshold Limit Concentration, 04/12/1999</td> <td><input type="checkbox"/></td> </tr> </tbody> </table> <p style="text-align: right;">Clear All Tags</p>	Library Name	Source	Matrix	Description	View Tag	Ambient Air, 2000	EPA Region IX	AIR	PRG value (EPA Region IX, 2000)	<input checked="" type="checkbox"/>	Industrial Soil, 2000	EPA Region IX	SO	PRG value (EPA Region IX, 2000)	<input checked="" type="checkbox"/>	Residential Soil, 2000	EPA Region IX	SO	PRG value (EPA Region IX, 2000)	<input checked="" type="checkbox"/>	Tap Water, 2000	EPA Region IX	AQ	PRG value (EPA Region IX, 2000)	<input checked="" type="checkbox"/>	MCL Action Level	CA Title 22	AQ	CA Title 22 MCL, 04/12/1999	<input type="checkbox"/>	MCL Primary	CA Title 22	AQ	CA Title 22 MCL, 04/12/1999	<input type="checkbox"/>	MCL Secondary	CA Title 22	AQ	CA Title 22 MCL, 04/12/1999	<input type="checkbox"/>	STLC	CA Title 22	AQ	CA Title 22 Soluble Threshold Limit Concentration, 04/12/1999	<input type="checkbox"/>
Library Name		Source	Matrix	Description	View Tag																																									
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Import Laboratory EDDs																																														
Project Completion Reports																																														
Comparison Reports and Custom Query Tool																																														
QCSR Reports																																														
MCL and PRG Libraries																																														
Historical Assessment Libraries																																														
Database Management	PROJECT SPECIFIC Contamination Limit Libraries <table border="1"> <thead> <tr> <th>Library Name</th> <th>Source</th> <th>Matrix</th> <th>Description</th> <th>View Tag</th> </tr> </thead> <tbody> <tr> <td>ACMEGWContaminationLimits</td> <td>ACME Waste Monitc</td> <td>AQ</td> <td>ACME Groundwater Contamination Limits.</td> <td><input type="checkbox"/></td> </tr> <tr> <td>ACMESoil ContaminationLimits</td> <td>ACME Waste Monitc</td> <td>SO</td> <td>ACME Soil Contamination Limits</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>ACMEWipeContaminationLimi</td> <td>ACME Waste Monitc</td> <td>Wipe</td> <td>ACME Wipe Contamination Limits</td> <td><input type="checkbox"/></td> </tr> </tbody> </table> <p style="text-align: right;">Clear All Tags</p>	Library Name	Source	Matrix	Description	View Tag	ACMEGWContaminationLimits	ACME Waste Monitc	AQ	ACME Groundwater Contamination Limits.	<input type="checkbox"/>	ACMESoil ContaminationLimits	ACME Waste Monitc	SO	ACME Soil Contamination Limits	<input checked="" type="checkbox"/>	ACMEWipeContaminationLimi	ACME Waste Monitc	Wipe	ACME Wipe Contamination Limits	<input type="checkbox"/>																									
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ACMEWipeContaminationLimi	ACME Waste Monitc	Wipe	ACME Wipe Contamination Limits	<input type="checkbox"/>																																										

EDMS: Data Assessment



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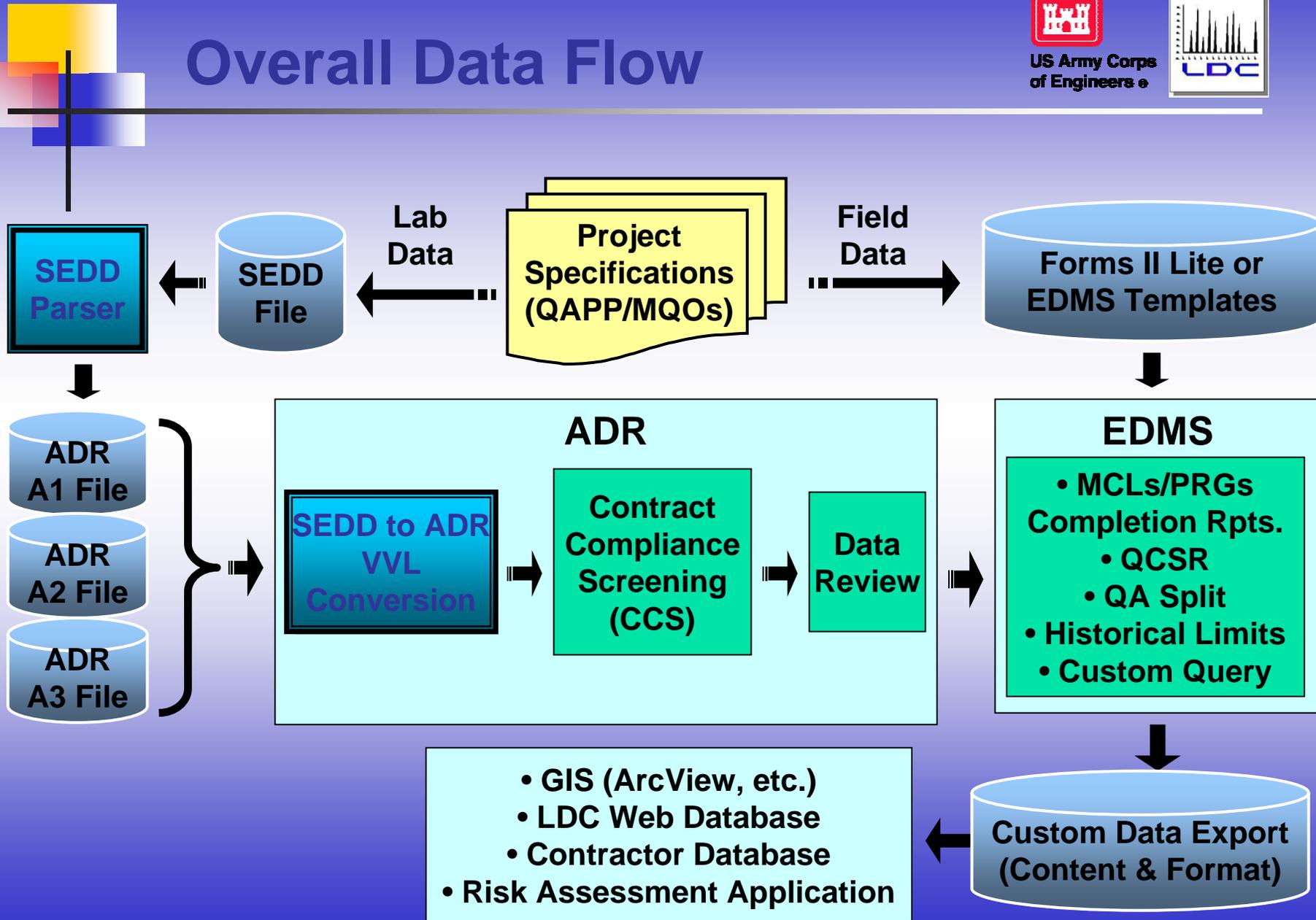
Contamination Limits Comparison Results

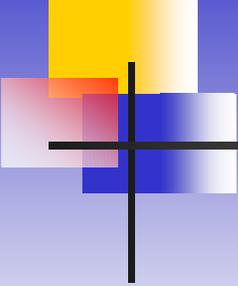
Client Sample ID **B100MMW3091Z** Lab ID **ACME** Contamination Limit Used **Tap Water, 2000**
 Collected **03/06/2000 0:00** Sample Matrix **AQ** Contamination Limit Source **EPA Region IX**

Analytical Method	Analyte Name	Final Result	Final Qual	Result Units	Contamination Limit	
8260B	1,1-Dichloroethene	0.500	U	ug/l	0.046	> Limit
8260B	1,2-Dichloroethane	0.355	J	ug/l	0.123	> Limit
8260B	1,3-Dichloropropene (total)	0.500	U	ug/l	0.395	> Limit
8260B	Chloroform	0.154	J	ug/l	0.165	
8260B	cis-1,2-Dichloroethene	8.55		ug/l	60.833	
8260B	Tetrachloroethene	0.500	U	ug/l	1.082	
8260B	Trichloroethene	0.500	U	ug/l	1.64	
8260B	Vinyl chloride	0.174		ug/l	0.041	> Limit

Sample Date	Lab ID	Sampl	Lab Meth	Analyte Name	Final Result	Final Qualifiers	Result Units	MCL Primary	Tap Water, 2000
03/06/2000 0:00	ACME	AQ	8260B	1,1-Dichloroethene	0.206	J	ug/l		0.046
03/06/2000 0:00	ACME	AQ	8260B	1,2-Dichloroethane	0.201	J	ug/l		0.123
03/06/2000 0:00	ACME	AQ	8260B	1,3-Dichloropropene (tot	1.00	U	ug/l		0.395
03/06/2000 0:00	ACME	AQ	8260B	cis-1,2-Dichloroethene	22.9		ug/l	6	
03/06/2000 0:00	ACME	AQ	8260B	Tetrachloroethene	8.39		ug/l	5	1.082
03/06/2000 0:00	ACME	AQ	8260B	Trichloroethene	46.4		ug/l	5	1.64
03/06/2000 0:00	ACME	AQ	8260B	Vinyl chloride	0.152	J	ug/l		0.041
03/06/2000 0:00	ACME	AQ	8260B	1,1-Dichloroethene	0.500	U	ug/l		0.046
03/06/2000 0:00	ACME	AQ	8260B	1,2-Dichloroethane	0.355	J	ug/l		0.123
03/06/2000 0:00	ACME	AQ	8260B	1,3-Dichloropropene (tot	0.500	U	ug/l		0.395
03/06/2000 0:00	ACME	AQ	8260B	cis-1,2-Dichloroethene	8.55		ug/l	6	
03/06/2000 0:00	ACME	AQ	8260B	Vinyl chloride	0.174		ug/l		0.041

Overall Data Flow

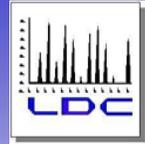




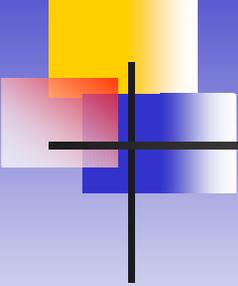
Why Automate?



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- **SEDD data is easily parsed into existing data review software**
- **SEDD DTD and ADR CCS ensure quality lab EDDs**
- **ADR provides vehicle to perform 100% review of sample data for a project**
- **Reduces time and effort to review project data and produce quality assessment and completeness reports**
- **Reduces labor and cost by approximately 50 %**



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of Engineers



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