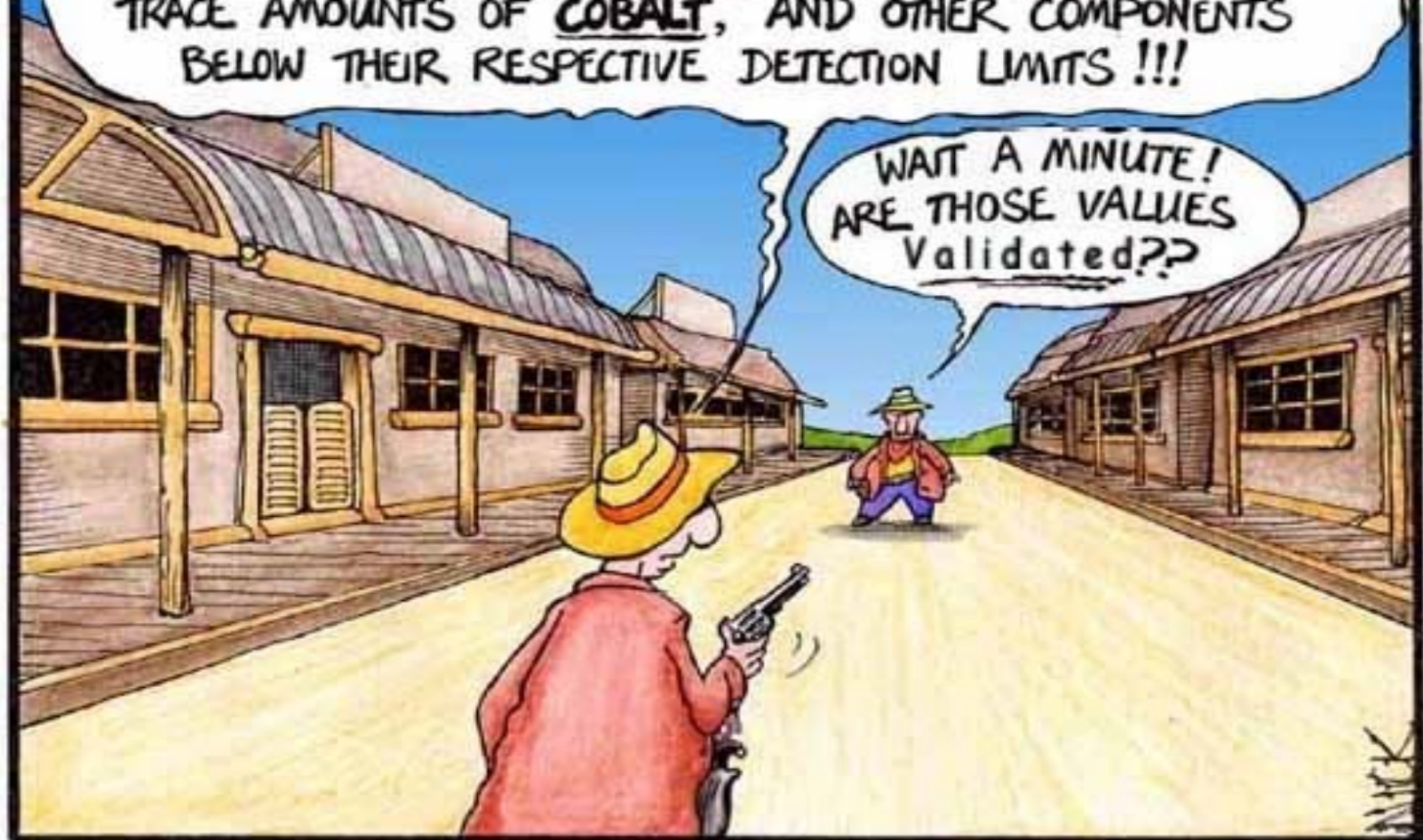


DON'T MOVE OR I'LL FILL YOU FULL OF **98% LEAD**,
1% ANTIMONY, **0.75% SILVER**, **200 PPM NICKEL**, WITH
TRACE AMOUNTS OF **COBALT**, AND OTHER COMPONENTS
BELOW THEIR RESPECTIVE DETECTION LIMITS !!!

WAIT A MINUTE!
ARE THOSE VALUES
Validated??



ANALYTICAL CHEMISTS IN THE WILD WEST

PILOT STUDY:

AUTOMATED DATA REVIEW OF SEDD FILES

**FOR AFCEE'S ARCTIC SURPLUS SALVAGE YARD
REMOVAL ACTION FAIRBANKS, ALASKA**

Scott Denzer, Laboratory Data Consultants

Lisa McKenzie, Earth Tech

Anand Mudambi, EPA

Javier Santillan AFCEE

Joseph F. Solsky, USACE

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INTRODUCTION

- **Over view of SEDD**
- **Overview of ADR**
- **The Pilot Study**
 - **Design**
 - **Results**
- **Evaluation of ADR and SEDD**

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SEDD = Staged Electronic Data Deliverable



```
<?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>
  <Date_Format>MM/DD/YYYY HH:mm:SS</Date_Format>
  <Comment>Generated by LIMS</Comment>
<Sample_And_Method>
  <Client_Method_ID>EPA 8260</Client_Method_ID>
  <Client_Sample_ID>04-ESI-SB04-23-00</Client_Sample_ID>
  <Collected_Date>09/23/2002 09:09:00</Collected_Date>
  <Comment></Comment>
  <Custody_ID></Custody_ID>
  <Lab_Contract></Lab_Contract>
  <Lab_ID>ABC</Lab_ID>
  <Lab_Name>ABC Labs</Lab_Name>
  <Lab_Receipt_Date>09/25/2002</Lab_Receipt_Date>
  <Lab_Reporting_Batch>WG11332</Lab_Reporting_Batch>
  <Lab_Sample_ID>MO20956-002</Lab_Sample_ID>
  <Matrix_ID>SOLID</Matrix_ID>
  <Method_Level></Method_Level>
  <Method_Batch>WG11332</Method_Batch>
  <Percent_Moisture>7.20</Percent_Moisture>
  <Percent_Solids>92.8</Percent_Solids>
  <pH></pH>
  <Preservative></Preservative>
  <Project_ID>12345-67</Project_ID>
  <Project_Name>Project XYZ</Project_Name>
  <QC_Category></QC_Category>
  <QC_Linkage>Preparation Batch</QC_Linkage>
  <Temperature>4.3</Temperature>

```

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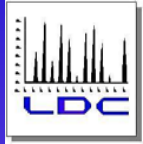
SEDD = Staged Electronic Data Deliverable



- **Stage 2a**
 - **Method Quality Control Data**
- **Stage 2b**
 - **Instrument Quality Control Data**
- **Stage 3**
 - **Allows for independent calculation of results**
- **Stage 4**
 - **Captures raw instrument data files**

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ADR = Automated Data Review



- Developed by Laboratory Data Consultants (LDC) for the USACE
- Laboratory Tool - Allows laboratories to verify EDD completeness and contract compliance.
- Data Review Tool - Allows data users to perform an automated data review against **project-specific library** measurement quality objectives.

ADR = Automated Data Review

ADR performs automated review of analytical data relative to project requirements.



ADR = Automated Data Review

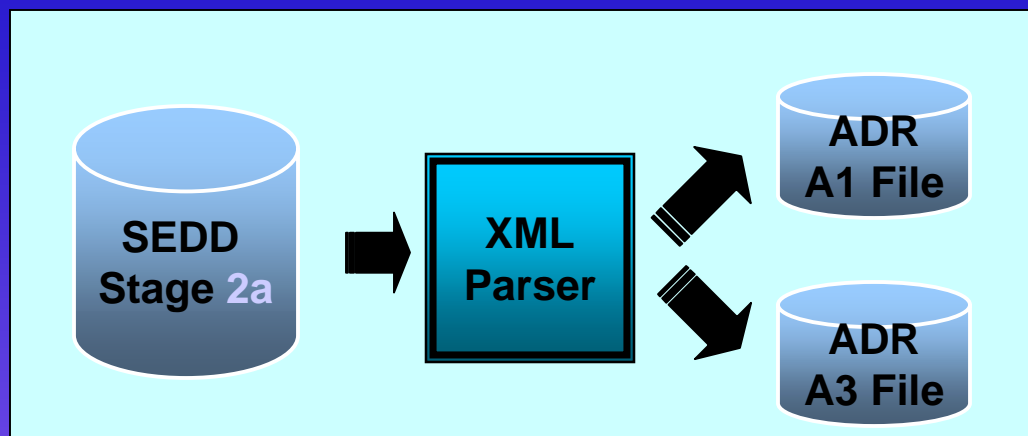


ADR electronic data deliverable (EDD) comprised of three sets of information reported in three normalized files

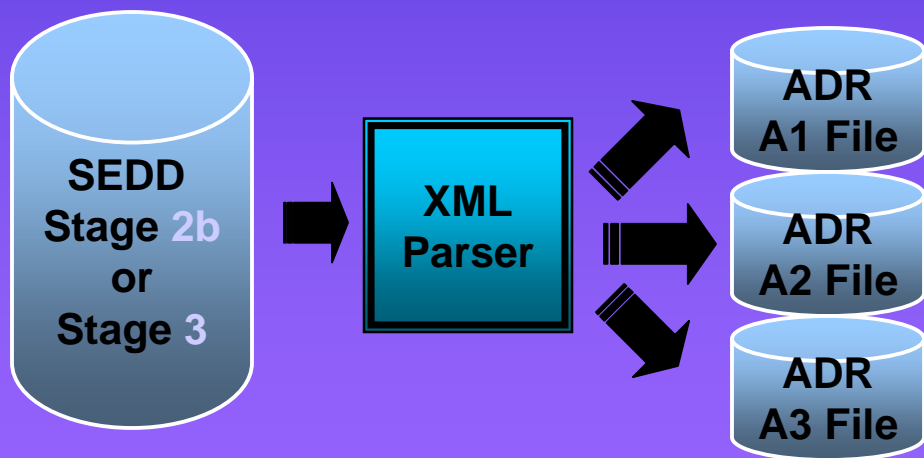
- Result information (A1)
- Calibration information (A2 - optional)
- Sample information (A3)

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SEDD AND ADR



- Result Information
- Sample Information



- Result Information
- Calibration Information
- Sample Information

SEDD/ADR PILOT TEST

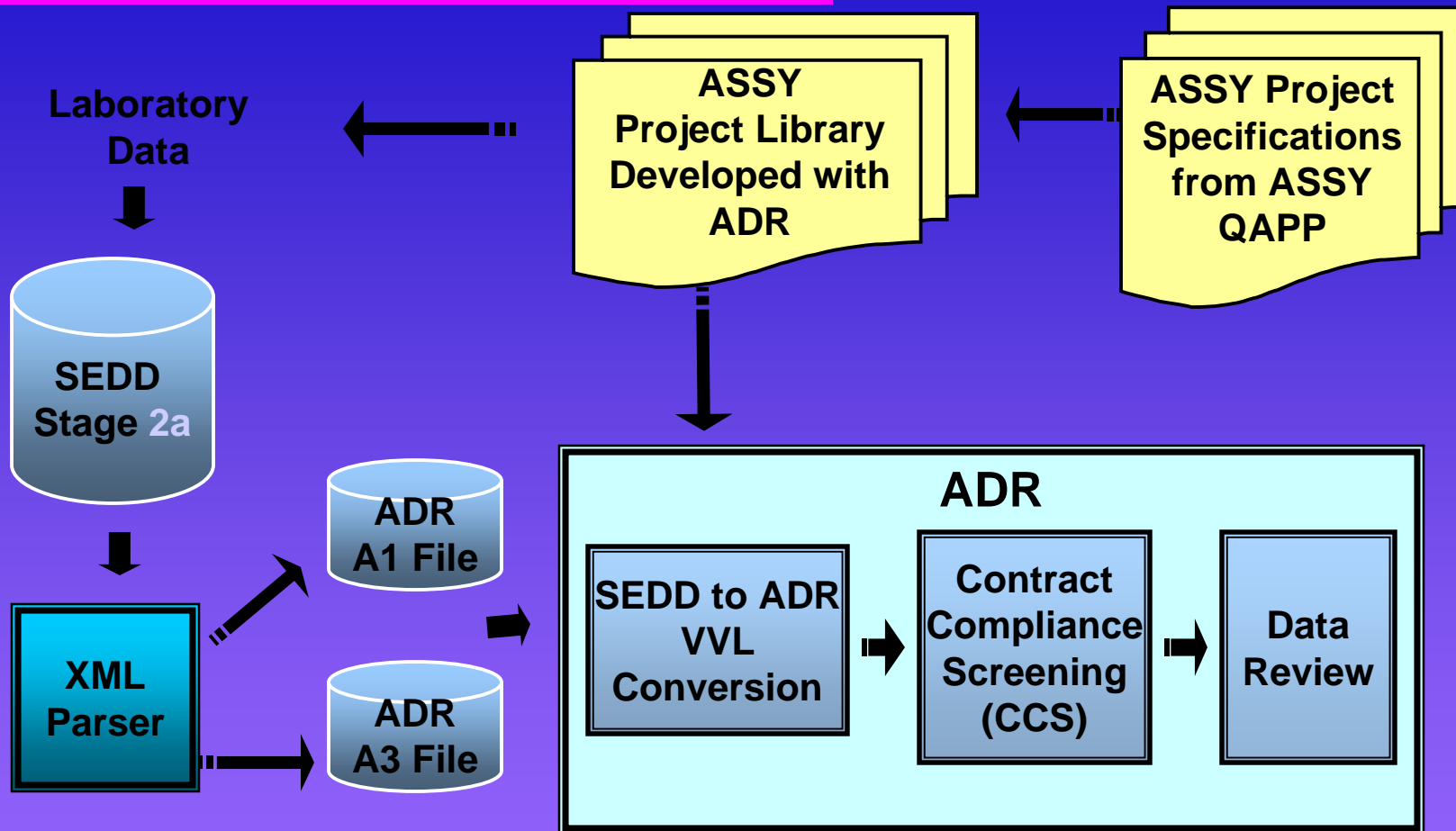


Soil Removal Action at Arctic Surplus Salvage Yard ASSY

- **Phase 1**
 - **Lead and PCBs in soil contaminants of concern**
 - **Data review and validation completed**
 - **Compare results of manual data review to automated data review**
- **Phase 2**
 - **Semiannual groundwater monitoring**
 - **Pesticides, PCBs, VOCs, and metals contaminants of concern**
 - **Use SEDD/ADR as a tool for data review**
 - **Compare 10% of ADR to manual reviews**

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SEDD/ADR PILOT TEST



PILOT TEST RESULTS – SEDD PARSING



- **Logic was required in Parser Tool to limit parsing to a single pass-through.**
- **DTD validation was required in the Parser Tool to ensure the file structure was correct before attempting to parse.**
- **XML technology was/is still evolving. Parser Tool was designed to take advantage of changing technology.**

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PILOT TEST RESULTS – SEDD PARSING



- **Translator was required in ADR to convert SEDD data content to ADR valid values.**
- **Project specific requirements must be relayed to the lab before SEDD files are created. ADR project-specific library is used to relay project requirements.**
- **Working on XML output of reviewed files and ADR Library.**

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PILOT TEST RESULTS – ADR



Elements Captured in the ADR Review

QAPP Compliance

- Reporting Limits
- Reporting Units
- Target Analytes
- Hold Times
- Sample Receipt Temperature

Laboratory Batch QC

- Assignment of Batches
- Surrogates
- Method Blanks
- Laboratory Control Samples
- Duplicates

Field QC Samples

- Matrix Spike/Matrix Spike Duplicates
- Equipment Blanks
- Field Duplicates

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PILOT TEST RESULTS – ADR



Elements Not Captured in the ADR Review

- **Calibrations**
- **Instrument Checks**
- **Raw Data**
- **Verification against COCs**
- **Recalculation of Results**
- **Completeness of Hard Copy**

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PILOT TEST RESULTS – ADR



Sample Qualification Report (All Qualified Results)

Client Sample ID : MW-01
 Sample Date : 10/06/2001
 Lab Sample ID: 810095-01

Lab Report Batch : AW309547
 Analysis Type: RES

Lab ID : LDC
 Sample Matrix : AQ

Reviewed By / Date :

Approved By / Date :

Analyte Name	Result	Uncertainty / Error	Result Units	Lab Qual	Rep Res	Overall Qual*	Temp	HT	MB	LCS	MS	Lab Dup	Surr	Rep Limit	Moist Tct/Dis	Field QC	Tune	IC	ICV	CV / CCV	
Analysis Method : 6010B																					
Dilution: 1.00																					
Manganese	5		UGL	U	YES	R					R										
Zinc	11		UGL		YES	U											U				
Analysis Method : 8081A																					
Dilution: 1.00																					
alpha-Chlordane	0.1		UGL		YES	U											U				
Methoxychlor	0.05		UGL	J	YES	UJ				U					J		U				
Analysis Method : 8260B																					
Dilution: 1																					
1,1-Dichloroethane	5		UGL	J	YES	U											U				
1,2,3-Trichloropropane	5		UGL	J	YES	U											U				
2-Butanone	10		UGL		YES	UJ											U			J	J
2-Chloroethyl vinyl ether	10		UGL	B	YES	UJ											U				J
2-Hexanone	10		UGL		YES	UJ											U			J	J
Acetone	10		UGL		YES	UJ											U			J	J
Benzene	2		UGL	J	YES	U											U				
Bromodichloromethane	5		UGL	J	YES	U											U				
Bromoform	5		UGL	J	YES	U											U				
Carbon disulfide	5		UGL		YES	U											U				
Isopropylbenzene	5		UGL	J	YES	U											U				
Total Xylenes	5		UGL	B	YES	U											U				
Trichloroethene	3.0		UGL	J	YES	UJ				U					J		U				
Analysis Method : 8270C																					
Dilution: 1.00																					
2,4-Dinitrotoluene	10		UGL	U	YES	R						R									
2-Chlorophenol	10		UGL	U	YES	UJ					UJ										
4-Chloro-3-methylphenol	10		UGL	U	YES	UJ					UJ										
4-Nitrophenol	25		UGL	U	YES	UJ						UJ									
Acenaphthene	10		UGL	U	YES	UJ					UJ	UJ									

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Lab Report Batch: SW80821042553

Lab ID: SGS AK

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	Reporting Limit Criteria*	Units
EB270504	1042553010	SW846_8082	AQ	Aroclor-1016	U	0.106	0.10	ug/L
				Aroclor-1221	U	0.106	0.10	ug/L
				Aroclor-1232	U	0.106	0.10	ug/L
				Aroclor-1242	U	0.106	0.10	ug/L
				Aroclor-1248	U	0.106	0.10	ug/L
				Aroclor-1254	U	0.106	0.10	ug/L
				Aroclor-1260	U	0.106	0.10	ug/L
MW5624270504	1042553009	SW846_8082	AQ	Aroclor-1016	U	0.102	0.10	ug/L
				Aroclor-1221	U	0.102	0.10	ug/L
				Aroclor-1232	U	0.102	0.10	ug/L
				Aroclor-1242	U	0.102	0.10	ug/L
				Aroclor-1248	U	0.102	0.10	ug/L
				Aroclor-1254	U	0.102	0.10	ug/L
				Aroclor-1260	U	0.102	0.10	ug/L
MW5626270504	1042553007	SW846_8082	AQ	Aroclor-1016	U	0.102	0.10	ug/L
				Aroclor-1221	U	0.102	0.10	ug/L
				Aroclor-1232	U	0.102	0.10	ug/L
				Aroclor-1242	U	0.102	0.10	ug/L
				Aroclor-1248	U	0.102	0.10	ug/L
				Aroclor-1254	U	0.102	0.10	ug/L

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PILOT TEST RESULTS – ADR



ADR results compared well to manual review results

- ADR did not miss observations made in manual review
- ADR resulted in more flags than manual review
- ADR allows for adjustment of flags based on professional judgment

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PILOT TEST RESULTS – ADR



The automated review flagged the PCB results when the sample receiving temperature was 1.1 and 6.2 degrees Celsius. Based on professional judgment, the manual reviewer did not flag the results.

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PILOT TEST RESULTS – ADR



The automated review flagged the PCB results because of a matrix spike failure. The manual reviewer did not flag the results because the sample concentration was greater than 4x the spiking concentration.

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SEDD/ADR PILOT TEST ASSESSMENT



Review and validation time reduced by approximately 30% assuming:

- **10% of the data requires a level III or IV type validation**
- **A complete ADR project library is established by the project chemist and distributed to the laboratory prior to sample analyses**
- **A project chemist oversees the review and validation.**

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SEDD/ADR PILOT TEST ASSESSMENT



Greater time reductions may be realized:

- **If analytical laboratories can capture calibration data in the SEDD file**
- **Where level III or IV type validation is not required.**
- **On long-term monitoring and remediation projects with reduced data validation requirements and well established quality control requirements.**

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SEDD/ADR PILOT TEST CHALLENGES



- **Valid values between SEDD and ADR**
- **LIMS Systems**
- **Field Sizes**

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CONCLUSIONS



- SEDD data is easily parsed into existing data review software.
- SEDD DTD and ADR CCS ensure quality laboratory EDDs.
- ADR is a tool for the project chemist to perform 100% review of sample data according to pre-established project library.
- Reduces time and effort to review project data and produce quality assessment and completeness reports by approximately 30%.

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Anand Mudambi: mudambi.anand@epa.gov 703-603-8796

Website: www.epa.gov/superfund/programs/clp/sedd.htm

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