



YOUR LAB OF CHOICE

One Lab's LIMS Journey from Paper based to Paperless Productivity



...Green Technology through
Innovation

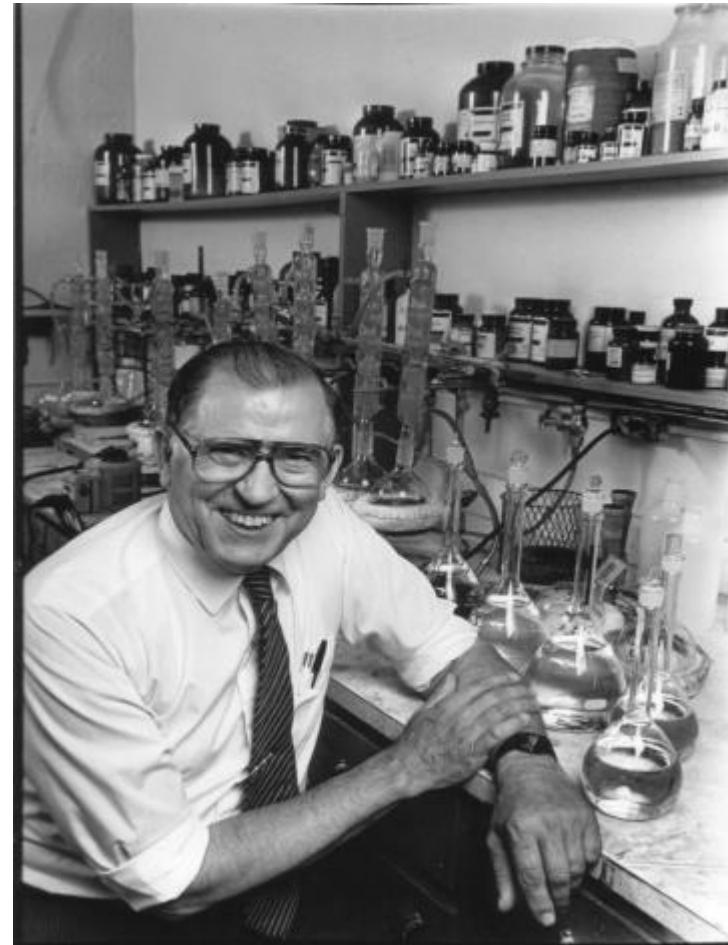


First Lab Location

circa 1987



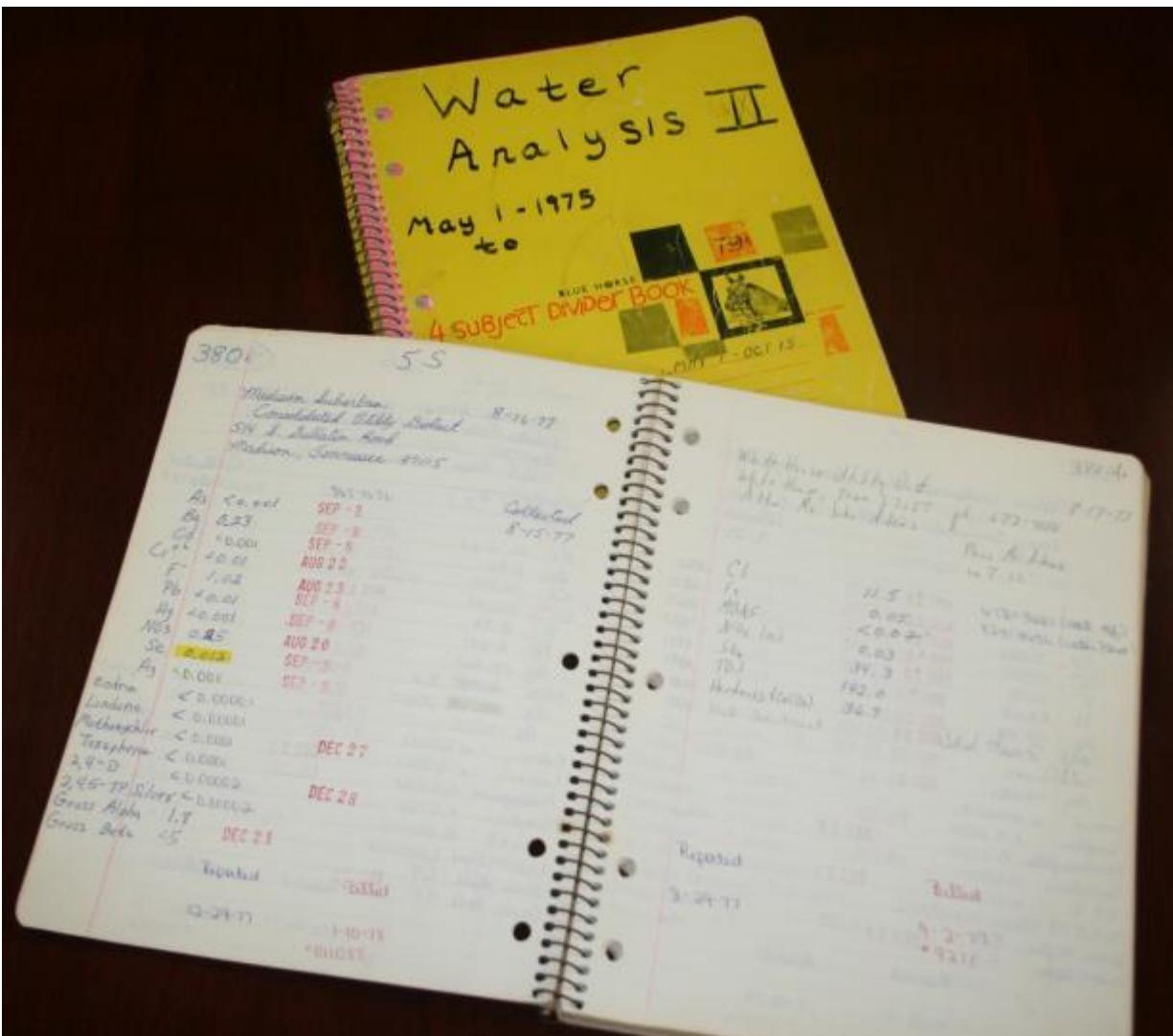
Founder
Dr. Arthur Schulert



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Innovation

 **ESC**
L A B S C I E N C E S

LIMS - circa 1987



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Buy vs. Build



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Initial Hardware

- Unix Oracle vs. PC - timing was right
- IBM PC - Token Ring network
- 386 - 16 mHz server w 80 MB HD - \$8,000



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Initial Software

- OS2 - transitioned to MS DOS
- Ashton Tate DB2 - transitioned to Foxpro



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Cost and Time Budgeting



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Key Decisions

- Initial Spec vs On the Fly
- Hire vs Contract
- Fixed Bid vs Hourly
- Start with Programmer vs Chemist

*Do we teach a Chemist to program or
teach a Programmer Chemistry?*



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90's - Major Projects

- Remote Access
- Paperless
- Capture
- Data Review



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Y2K

- Buy vs Build
- Selected LabVantage Seedpak
- Moved OS to Oracle/Linux
- Development moved to C # .Net Visual Studio



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Ongoing Developments

- Data Access - myESC
- Integrated Capture
- Upgraded Reports and EDDs
- Chain of Custody Review



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ANALYTICAL REPORT

April 08, 2016

myESC

ESC Standard - Nashville, TN

Sample Delivery Group: L754328
Samples Received: 04/06/2016
Project Number: Project 1234
Description: Project Description Here
Site: Site ABC
Report To: ESC Client Rep
Address: 12065 Lebanon Road
Mount Juliet, TN 37122

Entire Report Reviewed By:
M. W. Beasley
Mark W. Beasley
Technical Service Representative

Results were run to the items listed or indicated and are reported on manifest notes. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, testing conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 800-001, 800-002, and 800-004.

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859

SAMPLE RESULTS - 03

L754328

ONE LAB. NATIONWIDE.

MW-3

Semi-Volatile Organic Compounds (GC) by Method 8151

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
MOPP	U	ug/l	ug/l	ug/l	1	03/25/2015 20:45	W6776734
2,4-T	U	38.0	100	1	03/25/2015 20:45	W6776734	
2,4,5-T (Silvex)	U	0.210	2.00	1	03/25/2015 20:45	W6776734	
(β -2,4-Dichlorophenyl Acetic Acid)	68.1	0.270	2.00	1	03/25/2015 20:45	W6776734	
					28.2-146	03/25/2015 20:45	W6776734

Pesticides (GC) by Method 8081

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Aldrin	U	ug/l	ug/l	ug/l	1	03/24/2015 10:58	W6776882
Alpha BHC	U	0.00810	0.0500	1	03/24/2015 10:58	W6776882	
Beta BHC	U	0.070	0.0500	1	03/24/2015 10:58	W6776882	
Delta BHC	U	0.018	0.0500	1	03/24/2015 10:58	W6776882	
Gamma BHC	U	0.0200	0.0500	1	03/24/2015 10:58	W6776882	
Chlordane	U	0.0180	0.0500	1	03/24/2015 10:58	W6776882	
4,4-DDD	U	0.0980	0.500	1	03/24/2015 10:58	W6776882	
4,4-DE	U	0.070	0.0500	1	03/24/2015 10:58	W6776882	
4,4-DOT	U	0.0160	0.0500	1	03/24/2015 10:58	W6776882	
Dieldrin	U	0.0180	0.0500	1	03/24/2015 10:58	W6776882	
Endosulfan I	U	0.00750	0.0500	1	03/24/2015 10:58	W6776882	
Endosulfan II	U	0.0180	0.0500	1	03/24/2015 10:58	W6776882	
Endosulfan sulfate	U	0.0180	0.0500	1	03/24/2015 10:58	W6776882	
Endrin	U	0.0200	0.0500	1	03/24/2015 10:58	W6776882	
Endrin aldehyde	U	0.0190	0.0500	1	03/24/2015 10:58	W6776882	
Endrin ketone	U	0.0140	0.0500	1	03/24/2015 10:58	W6776882	
Hexachlorobenzene	U	0.070	0.0500	1	03/24/2015 10:58	W6776882	
Heptachlor	U	0.030	0.0500	1	03/24/2015 10:58	W6776882	
Heptachlor epoxide	U	0.0110	0.0500	1	03/24/2015 10:58	W6776882	
Methoxychlor	U	0.0180	0.0500	1	03/24/2015 10:58	W6776882	
Toxaphene	U	0.0190	0.0500	1	03/24/2015 10:58	W6776882	
(β -Decachlorobiphenyl)	40.1	0.170	0.500	1	03/24/2015 10:58	W6776882	
(β -Tetrachloro-m-xylene)	72.3				10.0-156	03/24/2015 10:58	W6776882
					13.9-137	03/24/2015 10:58	W6776882

Semi-Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Acenaphthene	ug/l	ug/l	ug/l	ug/l	1	03/20/2015 14:54	W6776622
Acenaphthylene	U	0.320	1.00	1	03/20/2015 14:54	W6776622	
Anthracene	U	0.310	1.00	1	03/20/2015 14:54	W6776622	
Benzidine	U	0.290	1.00	1	03/20/2015 14:54	W6776622	
Benzol[a]anthracene	U	4.30	10.0	1	03/20/2015 14:54	W6776622	
Benzol[b]fluoranthene	U	0.00290	1.00	1	03/20/2015 14:54	W6776622	
Benzol[b]phenanthrene	U	0.00210	1.00	1	03/20/2015 14:54	W6776622	
Benzol[a]perylene	U	0.360	1.00	1	03/20/2015 14:54	W6776622	
Benzol[ap]pyrene	U	0.00230	1.00	1	03/20/2015 14:54	W6776622	
BuP ₂ -chlorothoxyether	U	0.340	1.00	1	03/20/2015 14:54	W6776622	
BuP ₂ -chloroethyl ether	U	0.330	1.00	1	03/20/2015 14:54	W6776622	
BuP ₂ -chloropropyl ether	U	1.60	10.0	1	03/20/2015 14:54	W6776622	
4-Bromophenyl-phenylether	U	0.440	10.0	1	03/20/2015 14:54	W6776622	
2-Chloronaphthalene	U	0.340	10.0	1	03/20/2015 14:54	W6776622	
4-Chlorophenyl-phenylether	U	0.330	1.00	1	03/20/2015 14:54	W6776622	
Chrysene	U	0.300	10.0	1	03/20/2015 14:54	W6776622	
Dibenz(a,h)anthracene	U	0.330	1.00	1	03/20/2015 14:54	W6776622	
3,3-Dichlorobenzidine	U	0.280	1.00	1	03/20/2015 14:54	W6776622	
2,4-Dinitrotoluene	U	2.00	10.0	1	03/20/2015 14:54	W6776622	
2,6-Dinitrotoluene	U	1.60	10.0	1	03/20/2015 14:54	W6776622	
					0.280	03/20/2015 14:54	W6776622

ACCOUNT: ESC Standard - Nashville, TN

PROJECT: Project 1234

SD#: L754328

DATE/TIME: 04/08/15 11:36

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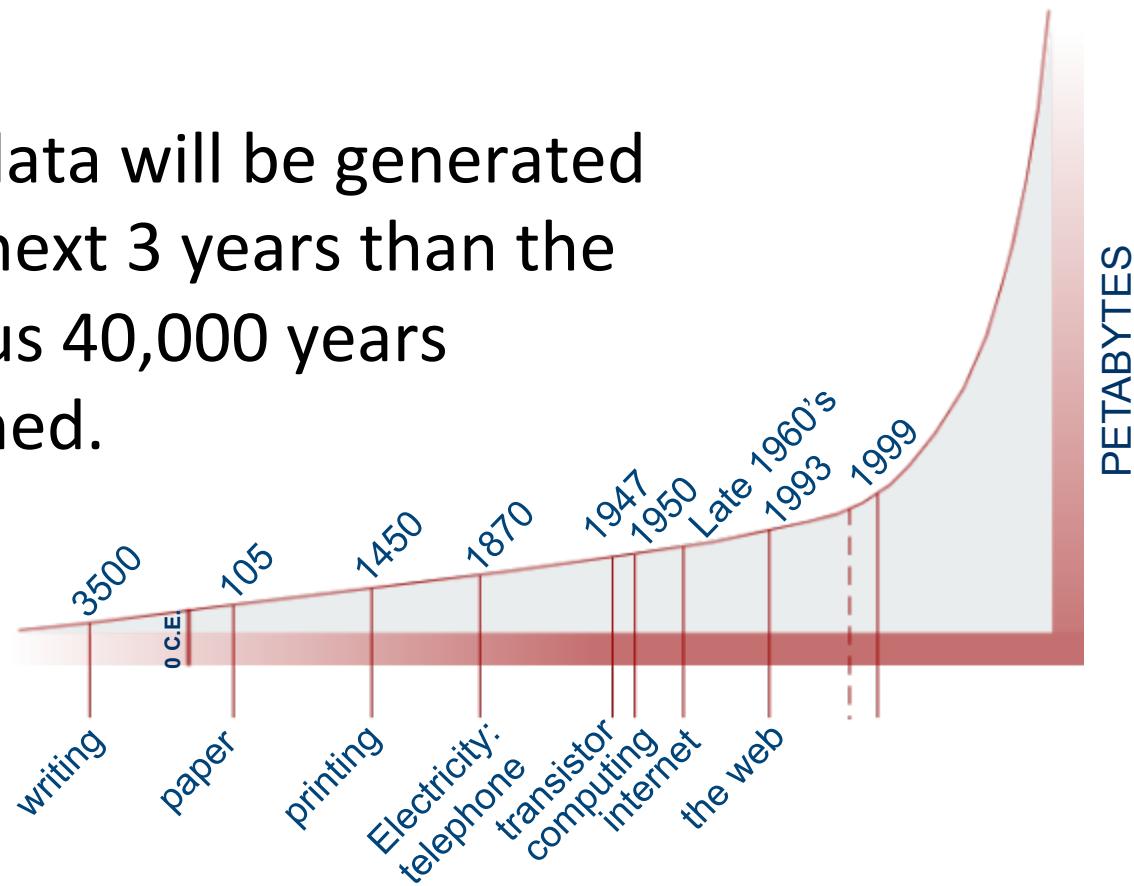


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ESC
L A B S C I E N C E S

Data Explosion

More data will be generated
in the next 3 years than the
previous 40,000 years
combined.



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Challenges

- Data Explosion
- Cloud vs Fixed Based
- Redundancy and Security



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Summary

- Consider a Hybrid System
- Buy where you can to minimize cost
- Build where you can create an advantage



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