



# Implementation of a Forensic LIMS

Dr. Aaike Oosterkamp  
LabWare Spain

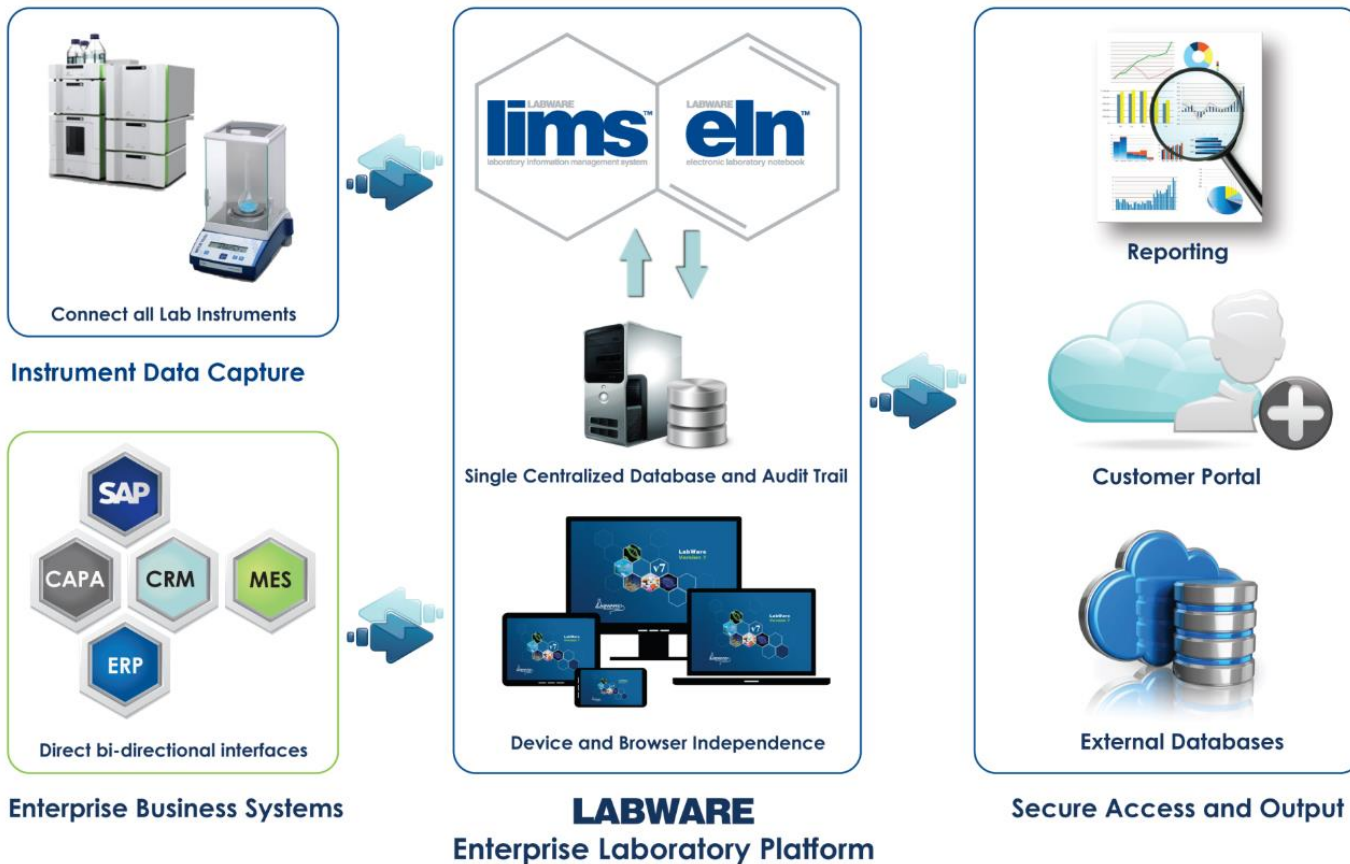


**Laboratory Information Management System (LIMS)**, is a software-based system that support a modern laboratory's operations. It tracks samples, manages laboratory work, captures results, and produces laboratory reports.



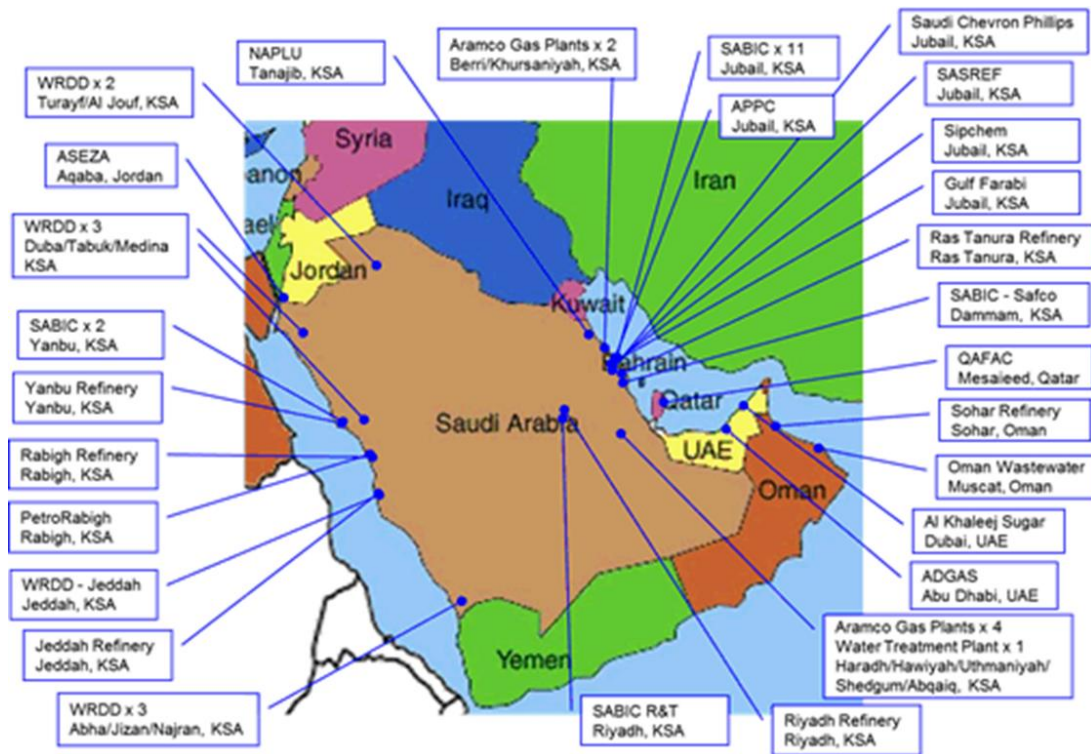
**Electronic Lab Notebook (ELN)** is a computer program designed to replace paper laboratory notebooks. ELNs are used by scientists, engineers, and technicians to document research, experiments, and procedures performed in a laboratory.

# LABWARE 7



# LabWare – Middle East

- LabWare – Middle East has a large customer base.



# LabWare – Middle East

- LabWare – Middle East has a large customer base.



الهيئة السعودية للمواصفات والمقاييس والجودة  
Saudi Standards, Metrology and Quality Org.

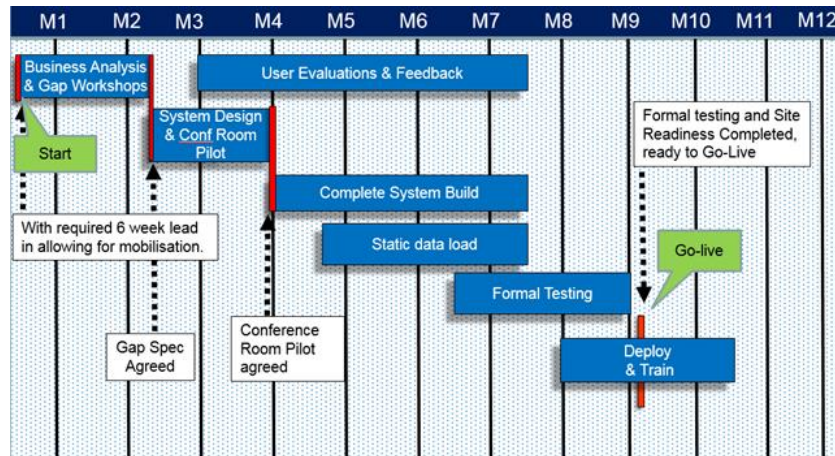


# LabWare in Forensics

- **LabWare's has a over 150 customers in Public Health, DNA and Forensics customer base.**
- **Large footprint in forensics**
  - Comprehensive implementations in UK, Spain, Denmark, US, Bulgaria, Colombia, Argentina, South Africa, Botswana, Australia, Singapore.



- ***Based on the several implementations, a set of base requirements was identified.***
  - General Forensic Requirements
  - Forensic DNA Requirements
  - Quality Requirements
- ***LabWare has created a vertical solution that covers the main requirements***
- ***Using this vertical solution, a project plan can be created to implement the solution in customers***



# General Requirements for a Forensic LIMS

- ***Case Management***
  - General Case Management for Cases that are received from external customers (police?)
  - Create Subtasks (sub-cases) for departments that are involved in the investigations
  - Workflows to manage subtasks (sub-cases) in the department.
- ***Exhibits Management***
  - Reception of Exhibits by Submissions
  - Chain of Custody of Exhibits throughout its life-cycle in the laboratory
- ***Analysis Management***
  - Assign analyses to exhibits
  - Automated results entry from instruments
  - Approval of results
- ***Report Management***
  - Automated report creation
  - Approval of Reports by several people
- ***KPIs***



# Forensic DNA Requirements

- ***Biological Material Recovery***
  - Identification of biological stains
  - Presumptive and Confirmation tests
  - Creation and Storage of Samples for DNA Analysis
- ***DNA Analyses***
  - DNA Extraction and Concentration Analyses
  - DNA Amplification and Profile Analyses
- ***DNA Profile Management***
  - Cross-contamination checks
  - Profile composition based on several kits
  - LR and Paternity calculations
  - Upload to National Databases

# Quality Requirements

- ***The main quality requirements are based on the ISO 17.025 standard***
- ***Full Auditing***
- ***Instrument Management***
  - Service, Maintenance, Calibration, Verification
- ***Standards & Reagents Management***
  - Barcode Labels
  - Reception, Opening, Usage
- ***Training***
- ***Document Management***

# Case Management

- **Case Management**
  - **Creation of cases**
    - General Case Management for Cases that are received from external customers

Create General Submission

Case:

Client:

Property Reference ID:

PIR:

FR:

Customer Ref:

Case Type:

OIC ID:

OIC/Contact:

Customer Division:

Courier Type:

Police Officer ID:

Courier:

Property Customer Division:

Work Requests:

Number Items:

Reception Location:

Received On:

Received By:

CASE: 1800031

Recent File Edit Contacts Linked Cases Run View Audit Reports Case Objects Review DNA Alerts Labels

Created By: AO  
Updated On: 26/09/2018

Owner: AO  
Closed: No

Summary Contacts Sub-Cases Linked Cases

## 1800031 Homicide

**Persons**

Relationship	First Name	Last Name	DOB	Sex	AP
VICTIM	DOE	doyne			

**Submission Items**

Barcode	Submission Item	Type	QID	Location	Item Rec'd In
1800031/1	AO20180926/1			BIOLOGY	
1800031/2	AO20180926/1				
1800031/3	AO20180926/1				

**Physical Case Files**

Sub-case	Location
1800031-BIOL-F1	

**Information from Pathology Body Sub-cases**

Sub-case	Last Name	First Name	Place of Death	Circumstance of Death

**Case Information**

Case Created: 26/09/2018 18:15:20

Status: Parent Active

Case Type:

Client:

Customer Division:

OIC/Contact:

Property Reference ID:

PIR:

FR:

Other Reference:

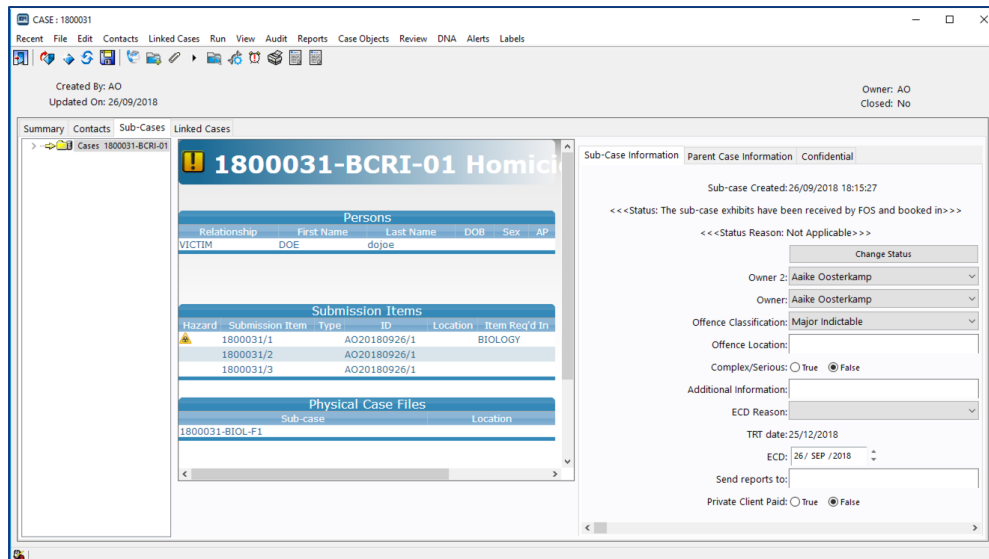
Coronial Reference:

Operation:

Suspect in Custody: ☐ True ☒ False

# Case Management

- **Case Management**
  - **Creation of Subtasks (Sub-cases) for departments**
    - Subtasks are created for the involved departments
    - In LabWare this is done by Subcases



CASE: 1800031  
 Recent File Edit Contacts Linked Cases Run View Audit Reports Case Objects Review DNA Alerts Labels  
 Created By: AO Updated On: 26/09/2018 Owner: AO Closed: No

Summary Contacts Sub-Cases Linked Cases  
 > Cases 1800031-BCRI-01

**1800031-BCRI-01 Homicide**

**Persons**  

Relationship	First Name	Last Name	DOB	Sex	AP
VICTIM	DOE	dojoe			

**Submission Items**  

Hazard	Submission Item	Type	ID	Location	Item Req'd In
⚠	1800031/1		AO20180926/1		BIOLOGY
	1800031/2		AO20180926/1		
	1800031/3		AO20180926/1		

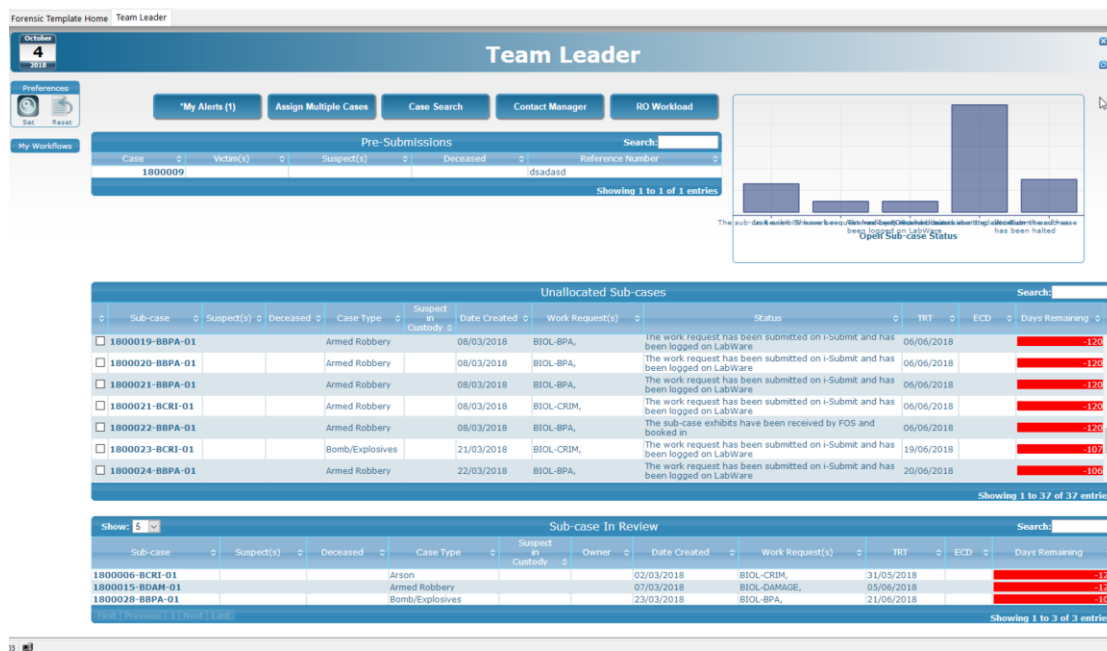
**Physical Case Files**  

Sub-case	Location
1800031-BIOL-F1	

**Sub-Case Information** Parent Case Information Confidential  
 Sub-case Created: 26/09/2018 18:15:27  
 <<<Status: The sub-case exhibits have been received by FOS and booked in>>>  
 <<<Status Reason: Not Applicable>>>  
 Change Status  
 Owner 2: Aaike Oosterkamp  
 Owner: Aaike Oosterkamp  
 Offence Classification: Major Indictable  
 Offence Location:  
 Complex/Serious: ☐ True ☒ False  
 Additional Information:  
 ECD Reason:  
 TRT date: 25/12/2018  
 ECD: 26 / SEP / 2018  
 Send reports to:  
 Private Client Paid: ☐ True ☒ False

# Case Management

- **Case Management**
  - **Workflows to manage cases**
    - Visual Workflows have been created for several roles in the Labs



# Exhibit Management

- **Exhibit Management**
  - **Reception of Submissions**
  - **Open Packages and create exhibits**
  - **Reporting**

Work with Submission Items and Exhibits

File Action

1800475/1  
1800475/1.001

**1800475/1 -**

Submission ID: S1800682

Submission Item

Property Info/Owner's Info  
PAUL TAN

Exhibit Complete

PD187 Description

Print Screen

Exhibit  
1800475/1.001

**Biology Sample**

Recent File Edit Log

Samples	Tests	Case	Laboratory	Submission Item	Exhibit	Exhibit Type	Owner	Origin	Expected DNA Level	Sample Type	Sample Description	Initial Step	Initial Test	Initial Test Comment	Initial PCR Kit	RO	Label Id/Extractor
1		1800475		1800475/1	1800475/1.001	ADRENALS	AMAXWELL			TRACE		Extraction	DNA Maxwell Extraction			AMAXWELL	
2		1800475		1800475/1	1800475/1.002	SWAB	AMAXWELL			TRACE		Extraction	DNA Maxwell Extraction			AMAXWELL	
3		1800475		1800475/1	1800475/1.003	EXPLOSIVE_RESIDE	AMAXWELL			TRACE		Extraction	DNA Maxwell Extraction			AMAXWELL	
4		1800475		1800475/1	1800475/1.004	BEVERAGE	AMAXWELL			TRACE		Extraction	DNA Maxwell Extraction			AMAXWELL	
5		1800475		1800475/1	1800475/1.005	BLOOD_CAV_PRESERVE	AMAXWELL			TRACE		Extraction	DNA Maxwell Extraction			AMAXWELL	
6		1800475		1800475/1	1800475/1.006	BUUP_SCREENING	AMAXWELL			TRACE		Extraction	DNA Maxwell Extraction			AMAXWELL	

**SUBMISSION SUMMARY**  
Case No: 1800031

Received by: Aulia Oosterkamp  
Received on: 26/09/2018 18:13  
Client: Northern Territory Police  
ORC/Contact:  
PPHS No: A/120180526/1  
PIR No:

Report No: 108  
Submission No: S1800032  
Delivered by: Sir OFFICER  
Collected on:  
FR:  
Other Ref:

**Persons**

FIRST NAME	LAST NAME	RELATIONSHIP	RELEVANT AP
dojoe	DUE	VICTIM	

**Items**

Item Code	Package Type	PPHS/Ref	Description
1800031/2		A/120180526/1	package

**Description**

180526/1 envelope with fingerprints

**Description**

Blood of victim  
Swab of another place  
Swab of shir

Blood of victim  
Swab of another place  
Swab of shir

# Case Management

- Chain of Custody Management
  - Movement of objects by barcodes (exhibits, bags, samples) through the Labs
  - Chain of Custody Reports

Storage Movement

File

Some locations have been duplicated

Movement being made by AO at 04/10/2018 12:11:00

Scan

Move To

Table Name	Object No.	Name	Type	Current Location	Remove
STORAGE_LOCATION	168/A1b	SHELF	FSSA > Level 4 > 4.06 >		

Items To Be Moved

Table Name	Object No.	Name	Type	Current Location	Remove
SAMPLE	1230	QC-DNA_EXT_NEG1810001	SAMPLE		
SAMPLE	1229	QC-DNA_EXT_POS1810001	SAMPLE		

Barcode: 7962

2628

0477.OA

Buttons: Move Items, Set User/Date, Cancel Movement

Storage Location Manager

File Object Reports

October 4 2018

Storage Location Manager

Print Location Content

Preferences Set Reset

Location Details

Name	Description	Location Number	Hierarchy	Capacity Used	Capacity Available	Total Capacity
Red (A1b)	Red (A1b)	169.4.06	FSSA > Level 4 > 169.4.06 > A1b > Red	N/A	N/A	N/A

Tree View: Forensic Lab > Basement > Ground > Level 1 > Level 2 > Level 3 > Level 4 > 4.01 > 4.05 > 4.06 > A1a > A1b > Red (A1b) > A1c > A1d > A1e > A1f > A2a > A2b > A2c

Case: 1800010

Chain of Custody Report

Note:

Created On: 07/03/2018 07:18:22 Status: PARENT\_OPEN

Owner: PLAW Template: CASE

Co-owner: Department: DEFAULT

Observations:

Package Custody

SUBMISSION\_ITEM 1800010/1

Date 07/03/2018 07:18:23

Previous Owner Current Owner

PLAW

SUBMISSION\_ITEM 1800010/2

Date 24/09/2018 11:21:39

Previous Owner Current Owner

AO

Evidence Custody

SWAB 1800010/1.01

Date 12/03/2018 23:08:47

Previous Owner Current Owner New Location

AMAXWELL AMAXWELL 1800010/1

12/03/2018 23:08:47 1800010/1

12/03/2018 23:08:47 20180312-01

SWAB 1800010/1.02

Date 12/03/2018 23:08:47

Previous Owner Current Owner New Location

AMAXWELL AMAXWELL 1800010/1

12/03/2018 23:08:47 1800010/1

12/03/2018 23:08:47 20180312-01

SWAB 1800010/1.03

Date 12/03/2018 23:08:47

Previous Owner Current Owner New Location

AMAXWELL AMAXWELL 1800010/1

12/03/2018 23:08:47 1800010/1

12/03/2018 23:08:47 20180312-01

SWAB 1800010/1.04

Date 12/03/2018 23:08:47

Previous Owner Current Owner New Location

AMAXWELL AMAXWELL 1800010/1

12/03/2018 23:08:47 1800010/1

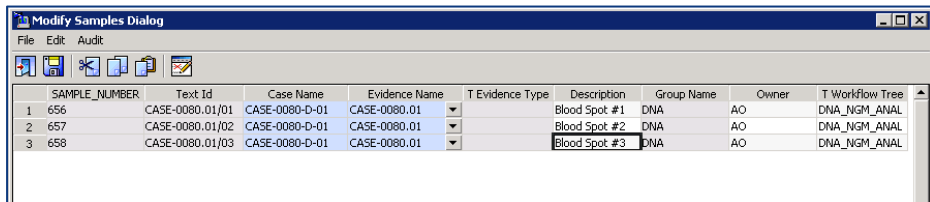
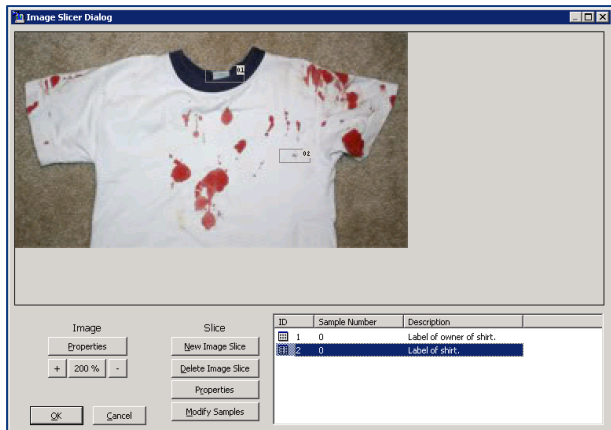
12/03/2018 23:08:47 20180312-01

SWAB 1800010/1.05



# Biological Material Recovery

- **Biological Material Recovery**
  - Identification of biological stains
  - Presumptive and Confirmation tests
  - Creation and Storage of Samples for DNA Analysis





**EXPERT REPORT**

Reference CASE-0080-D-01

---

**DNA**

---

**Reference Information**

OWNER  
AGENCY  
AGENCY REF  
JUSTICE DPT  
JUSTICE REF

AO  
MADRID POLICE  
123123

---

**Evidence**

BC	Case ID	Material	Description
123	CASE-0080.01	CLOTH	Shirt with blood
234	CASE-0080.03	BLOOD	Blood 2
345	CASE-0080.02	BLOOD	Blood 1

---

**Biological Trace Description**

CASE-0080.01 Shirt with blood



Spot 1	Label of owner of shirt.		
Sample			
Spot 2	Label of shirt.		
Sample			
Spot 3	Blood spot	HEXAGON OB	TEICHMAN
Sample	CASE-0080.01/01		
Spot 4	Blood Spot #2	TEICHMAN	HEXAGON OB
Sample	CASE-0080.01/02		
Spot 5	Blood Spot #3	TEICHMAN	HEXAGON OB
Sample	CASE-0080.01/03		

Page 1 of 2

# Forensic DNA Workflow

## • Workflow

### • Laboratory Analysis

- Extraction, DNA Quantification
- DNA Amplification, CE

### • Interpretation Analyst Software

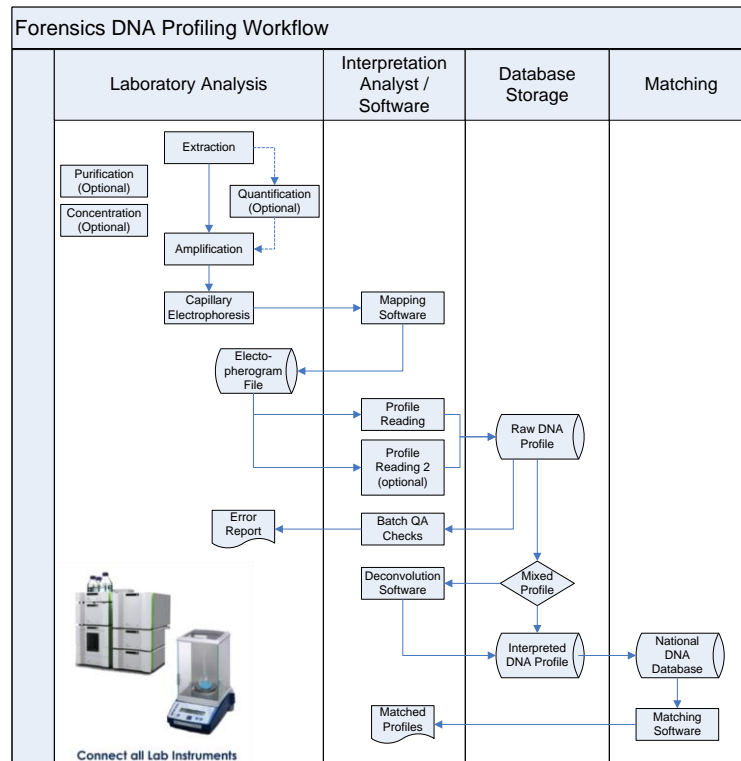
- Profile Readings
- QC Checks

### • Database Storage

- DNA Profile storage

### • Matching

- Upload into National Database, such as CODIS.
- Run daily match reports.
- Recover matches and report to case



# DNA Analysis Assignment

- **DNA Analysis Assignment**
  - The Expert assigns Analyses to the exhibits
  - These are then passed to the lab
  - The analysis process should run in an automated manner

DNA Sample Manager: 1800015

File Action

1800015/1.01

- DNA Samples 88
  - 1800015/1.01-01
  - 1800015/1.01-02
  - 1800015/1.01-03
  - 1800015/1.01-04
  - 1800015/1.01-05
- Sample Results 1
  - DNA Analyses 7
    - Raw Profiles 2
      - DNA Raw Profile ID / 312 - GFE
      - DNA Raw Profile ID / 427 - GFE
    - Consolidated Profiles 1
      - DNA Consolidated Profile / 477 - GFE**
    - Statistical Analyses 1
      - Random Match Probability / Interpreted Profiles 0
      - All Tests - 11
      - Composite Sample - 0
- 1800015/1.01-06
- 1800015/1.01-07
- 1800015/1.01-08
- 1800015/1.01-09
- 1800015/1.01-10
- 1800015/1.01-11
- 1800015/1.01-12
- 1800015/1.01-13
- 1800015/1.01-14
- 1800015/1.01-15
- 1800015/1.01-16
- 1800015/1.01-17
- 1800015/1.01-18
- 1800015/1.01-19
- 1800015/1.01-20
- 1800015/1.01-21
- 1800015/1.01-22
- 1800015/1.01-23
- 1800015/1.01-24
- 1800015/1.01-25

## 1800015/1.01-05

Sample	
Field	Value
Sample	988
Sample Number	988
Text ID	1800015/1.01-05
Status	P
T Submission Item	1800015/1
Exhibit	
Exhibit Type	Swab
Owner	Andrew Maxwell
Origin	Suspects
Origin Category	Reference
Analytical Category	Reference
Sample Type	Blood
Sampling Device	
Sample Object	
Sample Description	
Initial Test	adds the DNA_EXT_FTA_GFA analysis
Initial Test Comment	
Initial PCR Kit	
RO	Andrew Maxwell

Consolidated Profile Details				
Profile Number	Kit	Import Batch	Comment	Stats File
477 GFE	CONSOLIDATED		Consolidated from (312,427)	

Source Information				
Analysis	CE Sample ID	Batch Details	Profile Number	Consolidated

Profile	
Locus	Alleles
D3S1358	15
D16S539	15
TPOX	13
YINDEL	1
AMEL	X
D8S1179	19
D21S11	24,2
TH01	9
D13S317	12
D10S1248	14
D1S1656	17,3
D2S1338	24, 26

Statistics	
Name	Value
No data available in table	

# DNA Analysis in the Lab

- **DNA Analysis in the Lab**
  - DNA Extraction and Concentration analysis
    - Organic Extraction,
    - Quant Duo, Quant Trio
  - DNA Kits Analysis
    - GlobalFiler, PowerPlex, Identifier, YFiler

Unassigned		Search:
Analysis	Tests	Rework
Capillary Electrophoresis	54	
Capillary Electrophoresis - YFiler Plus	50	
IQ Extraction (LHP)	26	
Maxwell Extraction	12	
Organic Extraction	19	
Organic Differential Extraction	78	
PCR GlobalFiler	195	
PCR PowerPlex Fusion 6C	22	
PCR PowerPlex Y23	3	
PCR YFiler Plus	133	
Quant Duo	39	
Quant Trio	185	

**DNA Analysis Plates**

Unassigned Search:

Analysis	Tests	Rework
Capillary Electrophoresis	54	
Capillary Electrophoresis - YFiler Plus	50	
IQ Extraction (LHP)	26	
Maxwell Extraction	12	
Organic Extraction	19	
Organic Differential Extraction	78	
PCR GlobalFiler	195	
PCR PowerPlex Fusion 6C	22	
PCR PowerPlex Y23	3	
PCR YFiler Plus	133	
Quant Duo	39	
Quant Trio	185	

Open Analytical Plates

Name	Template	Owner	Date Created
PCR1804-02	DNA_PCR_GF	Andrew Maxwell	24/04/2018 04:15:35 AM
EXT1805-03	DNA_EXT_DIFF	Kingsley Chow	03/05/2018 01:35:45 AM
EXT1805-05	DNA_EXT_ORGANIC	Kingsley Chow	03/05/2018 07:12:11 AM
QUANT1805-02	DNA_QUANT_DUO	Andrew Maxwell	04/05/2018 04:44:12 AM
QUANT1805-04	DNA_QUANT_DUO	Andrew Maxwell	14/05/2018 02:49:25 AM
EXT1805-09	DNA_EXT_ORGANIC_DIFF	Andrew Maxwell	17/05/2018 01:12:05 AM
PCR1805-05	DNA_PCR_GF	Kingsley Chow	17/05/2018 04:37:53 PM
PCR1805-06	DNA_PCR_GF	Kingsley Chow	17/05/2018 04:44:46 PM
CE1805-06	DNA_CE	Andrew Maxwell	18/05/2018 03:10:50 AM
PCR1805-11	DNA_CE	Andrew Maxwell	22/05/2018 05:25:24 AM
PCR1805-10	DNA_PCR_GF	Andrew Maxwell	22/05/2018 09:49:45 AM
EXT1807-02	DNA_EXT_MAXWELL	Kingsley Chow	13/07/2018 07:02:47 AM
EXT1807-03	DNA_EXT_ORGANIC_DIFF	Kingsley Chow	13/07/2018 07:23:54 AM
CE1809-01	DNA_CE	Andrew Maxwell	19/09/2018 01:20:44 AM

Plate Manager: Plate CE1809-02

Recent File View Options Audit Edit DNA Actions

Layout Summary Results Dashboard C Drop/Plate/Unbatch

Well	Type	ID	Label	Raw Result	Result
A1	Sample	2627	0477.0A1 - GF	1.20V 26sec	
B1	Sample	2627	POS_2009A1 - GF	1.20V 26sec	
C1	Sample	2628	0477.0A1 - GF	1.20V 26sec	
D1	Sample	2633	MES_2009A1 - GF	1.20V 26sec	
E1	Sample	2629	0477.0A1 - GF	1.20V 26sec	
F1	Sample	2630	0477.0A1 - GF	1.20V 26sec	
G1	Sample	2631	BIS_2009A1 - GF	1.20V 26sec	
H1	Sample	2632	BIS_2009A1 - GF	1.20V 26sec	
A2	Sample	2633	BIS_2009A1 - GF	1.20V 26sec	
B2	Sample	2634	BIS_2009A1 - GF	1.20V 26sec	

Assigned Operator: AMAXWELL  
T instrument: Name: CE1809-02  
Created On: 20/09/2018 12:57:39 AM  
Changed By: AMAXWELL  
Changed On: 20/09/2018 12:57:39 AM

Phase Confirm: Sort and add ladders? [Yes] [No]

# Instrument Integration

- Extraction and DNA Quantification
  - Extraction Robots
  - Export and Import to QuantiFiler by files
  - Options to decided to rework samples

Start and End time for CE Run

Start Time: 19/ SEP /2018 10:58:38 PM  
 End Time: 20/ SEP /2018 12:58:38 AM

Setup Instrument:  
 Analytical Instrument: 3130xl Genetic Analyzer #1  
 3130xl Genetic Analyzer #2  
 7500 Real-Time PCR System  
 MicroLabs Autolys STAR  
 GeneAmp 9700 Thermal Cycler  
 MAGNETIC EXTRACTION

QNT-1809-02 - Notepad

File Edit Format View Help

- \* Block Type = 96alum
- \* Chemistry = TAQMAM
- \* Experiment File Name = QNT-1809-02.txt
- \* Experiment Run End Time = Not Started
- \* Instrument Type = sds7500
- \* Passive Reference = MP

[Sample Setup]

Well	Sample Name	Sample Color	Target Name
A1	QC-DNA_STD_QFA1809003	"RGB(128,0,128)"	
A1	QC-DNA_STD_QFA1809003	"RGB(128,0,128)"	
A1	QC-DNA_STD_QFA1809003	"RGB(128,0,128)"	
A1	QC-DNA_STD_QFA1809003	"RGB(128,0,128)"	
B1	QC-DNA_STD_QFA1809004	"RGB(128,0,128)"	
B1	QC-DNA_STD_QFA1809004	"RGB(128,0,128)"	
B1	QC-DNA_STD_QFA1809004	"RGB(128,0,128)"	
B1	QC-DNA_STD_QFA1809004	"RGB(128,0,128)"	
C1	QC-DNA_STD_QFB1809003	"RGB(128,0,128)"	
C1	QC-DNA_STD_QFB1809003	"RGB(128,0,128)"	
C1	QC-DNA_STD_QFB1809003	"RGB(128,0,128)"	
C1	QC-DNA_STD_QFB1809003	"RGB(128,0,128)"	
D1	QC-DNA_STD_QFB1809004	"RGB(128,0,128)"	
D1	QC-DNA_STD_QFB1809004	"RGB(128,0,128)"	
D1	QC-DNA_STD_QFB1809004	"RGB(128,0,128)"	
D1	QC-DNA_STD_QFB1809004	"RGB(128,0,128)"	
E1	QC-DNA_STD_QFC1809003	"RGB(128,0,128)"	
E1	QC-DNA_STD_QFC1809003	"RGB(128,0,128)"	
E1	QC-DNA_STD_QFC1809003	"RGB(128,0,128)"	
E1	QC-DNA_STD_QFC1809003	"RGB(128,0,128)"	
F1	QC-DNA_STD_QFC1809003	"RGB(128,0,128)"	
F1	QC-DNA_STD_QFC1809003	"RGB(128,0,128)"	
F1	QC-DNA_STD_QFC1809003	"RGB(128,0,128)"	
F1	QC-DNA_STD_QFC1809003	"RGB(128,0,128)"	
G1	QC-DNA_STD_QFC1809003	"RGB(128,0,128)"	
G1	QC-DNA_STD_QFC1809003	"RGB(128,0,128)"	

QuantiFiler  
 Instrument file

C:\Clients\Forensics Solution\VS\Data\DNA\Quant\QUANT1809-03-Load file.txt - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window

- \* Block Type = 96alum
- \* Chemistry = TAQMAM
- \* Experiment File Name = QUANT1809-03-Load file.txt
- \* Experiment Run End Time = Not Started
- \* Instrument Type = sds7500
- \* Passive Reference = ROX

[Sample Setup]

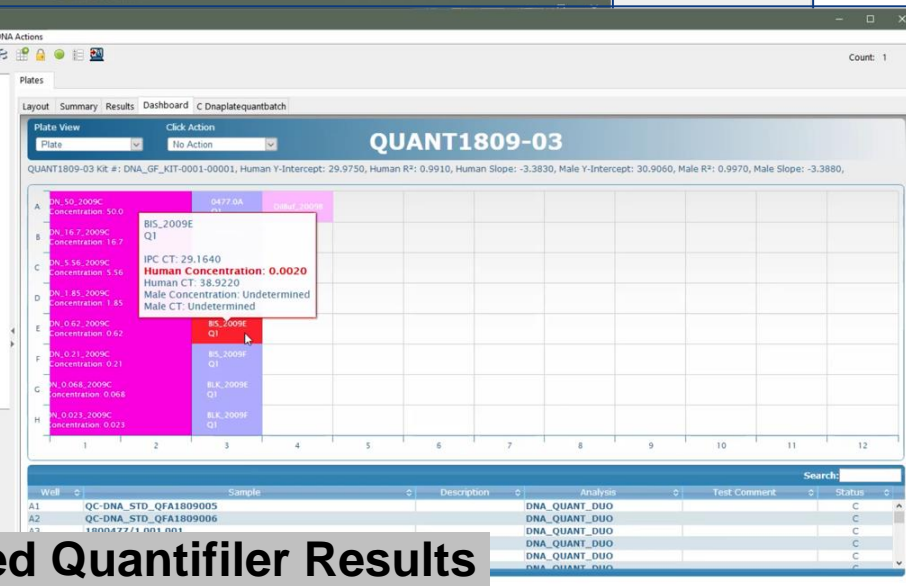
Well	Sample Name	Sample Color	Target Name	Target Name
9	A1	50.0	Duo Human	STANDARD VIC NFO
10	A1	50.0	Duo IPC	UNKNOWN NED NFO-MGB
11	A1	50.0	Duo Male	STANDARD FAM NFO
12	B1	16.7	Duo Human	STANDARD VIC NFO
13	B1	16.7	Duo IPC	UNKNOWN NED NFO-MGB
14	B1	16.7	Duo Male	STANDARD FAM NFO
15	C1	5.56	Duo Human	STANDARD VIC NFO
16	C1	5.56	Duo IPC	UNKNOWN NED NFO-MGB
17	C1	5.56	Duo Male	STANDARD FAM NFO
18	D1	1.85	Duo Human	STANDARD VIC NFO
19	D1	1.85	Duo IPC	UNKNOWN NED NFO-MGB
20	D1	1.85	Duo Male	STANDARD FAM NFO
21	E1	0.62	Duo Human	STANDARD VIC NFO
22	E1	0.62	Duo IPC	UNKNOWN NED NFO-MGB
23	E1	0.62	Duo Male	STANDARD FAM NFO
24	F1	0.21	Duo Human	STANDARD VIC NFO
25	F1	0.21	Duo IPC	UNKNOWN NED NFO-MGB
26	F1	0.21	Duo Male	STANDARD FAM NFO
27	G1	0.068	Duo Human	STANDARD VIC NFO
28	G1	0.068	Duo IPC	UNKNOWN NED NFO-MGB
29	G1	0.068	Duo Male	STANDARD FAM NFO
30	H1	0.023	Duo Human	STANDARD VIC NFO
31	H1	0.023	Duo IPC	UNKNOWN NED NFO-MGB
32	H1	0.023	Duo Male	STANDARD FAM NFO

QuantiFiler  
 Result file

Plate Manager - Plate: QUANT1809-03

Recent File View Options Audit Edit DNA Actions

QUANT1809-03



Imported Quantifiler Results

# Instrument Integration

- Sequencing information
  - Export to Sequencing Instrument
  - Import from GeneMapper

## Sequencing instrument file

Well	Sample Name	Assay	Results Group	File Name Convention	Sample Type
A01	1800477.1.001.001	DNA_HSA_FNC	Sample	C1	
B01	QC-DNA_PCR_POS1809002	DNA_HSA_FNC	Positive Control	C1	
C01	1800477.1.002.001	DNA_HSA_FNC	Sample	C1	
D01	QC-DNA_PCR_NEG1809002	DNA_HSA_FNC	Negative Control	C1	
E01	1800477.1.003.001	DNA_HSA_FNC	Sample	C1	
F01	1800477.1.004.001	DNA_HSA_FNC	Sample	C1	
G01	QC-DNA_EXT_POS1809007	DNA_HSA_FNC	Positive Control	C1	
H01	QC-DNA_EXT_POS1809009	DNA_HSA_FNC	Positive Control	C1	
A02	QC-DNA_EXT_NEG1809009	DNA_HSA_FNC	Negative Control	C1	
B02	QC-DNA_EXT_NEG1809010	DNA_HSA_FNC	Negative Control	C1	
C02	0	DNA_HSA_FNC	Sample		
D02	0	DNA_HSA_FNC	Sample		
E02	0	DNA_HSA_FNC	Sample		
F02	0	DNA_HSA_FNC	Sample		
G02	0	DNA_HSA_FNC	Sample		
H02	0	DNA_HSA_FNC	Sample		
A03	0	DNA_HSA_FNC	Sample		
B03	0	DNA_HSA_FNC	Sample		
C03	0	DNA_HSA_FNC	Sample		
D03	0	DNA_HSA_FNC	Sample		
E03	0	DNA_HSA_FNC	Sample		
F03	0	DNA_HSA_FNC	Sample		
G03	0	DNA_HSA_FNC	Sample		

## GeneMapper result file

Allele	Sequence	Position	Score
Allele 5	Al_0007_1800477-1.001.001	U	12
Allele 6	Al_0007_1800477-1.001.001	U	12
Allele 7	Al_0007_1800477-1.001.001	U	12
Allele 8	Al_0007_1800477-1.001.001	U	12
Allele 9	Al_0007_1800477-1.001.001	U	12
Allele 10	Al_0007_1800477-1.001.001	U	12
Allele 11	Al_0007_1800477-1.001.001	U	12

## Import Sequences into LabWare

### CE1809-02-01

**Import Manager**

File Action

CE1809-02-01

Samples (0)

Raw Profile

Batch

Standard S

Profiles - R

**DNA Import - Edit Readers**

Reader 1: AMAXWELL

Reader 1 Initials: AM

Reader 2: KINGSLLEY

Reader 2 Initials: KC

OK Cancel

**Raw Profiles**

Search:

Value	Sample ID	Sample Type	DNA Kit	Comment	Raw Profile	Final Profile	Approved On
GlobalFilter							
False							

No data available in table

# Profile Management

- ***Profile information***
  - Revise Profiles
  - Interpret difference between two independent reads
  - Unite profile based on different kits
- ***Calculations of Match Probabilities***
  - Random Match Probabilities based on population
  - Parentage calculations
- ***Cross-contaminations***
  - Run queries on cross-contaminations (optional)
    - This is optional, as it may be chosen to be performed in other software
- ***Upload profiles to National Database***
  - Define export formats to National Databases
- ***Receive Matches from National Database***
  - Receive Matches of National Database
  - This information can be incorporated in the final report that is sent to the customer



# Case Reporting

- **Final Report Creation**
  - Based on the results that have been imported, automated final reports can be created that comprise Case Information, Exhibit Information and Analytical Results. As well final conclusions can be added.

**DNA Database Laboratory**  
1013 Whitehorse Rd  
Melbourne 3128  
Tel No. 9490 7777

**Case No.** HT18-0537  
**Agency Reference No.** Test PCR 002 - 002  
**Other Reference No.** Test Other Ref No

**REPORT**

**SUBMISSION DATA**

Submission Date/Time:	09/24/2018 04:16:33
No. of Exhibits Submitted:	4
Submitter:	INSP, Ale Xyz
Agency Div/Department:	J DIVISION

Case No.	Sample Marking	Seal
HT18-0537-001E01	Test PCR 002 - 002	Crown
HT18-0537-001E02	Test PCR 002 - 002	Crown

Examination(s) Conducted	Description
DNA Analysis	A mixed DNA obtained from Persons* com Identification possible. The

\*PLEASE NOTE THAT THIS REPORT IS NOT INTENDED FOR USE IN COURT

**\*HT18-0537\***  
HT18-0537

**DNA Database Laboratory**  
1013 Whitehorse Rd  
Melbourne 3128  
Tel No. 9490 7777

**Case No.** HT18-0537  
**Agency Reference No.** Test PCR 002 - 002  
**Other Reference No.** Test Other Ref No

**CONFIDENTIAL**

**LABWARE**  
Results Count

Locus	HT18-0537-001
D3S1358	15, 16
VWA	14, 16
D16S539	9, 10
CSF1PO	10, 12
TPOX	8, 8
YINDEL	2
AMEL	X, Y
DBS1179	12, 13
D21S11	29, 31
D18S51	12, 15
DYS391	11
D2S441	14, 15
D19S433	14, 15
TH01	9.3, 7
FGA	24, 26
D22S1045	11, 16
D5S818	11, 11
D13S317	11, 11
D7S820	7, 12
SE33	25.2, 17
D10S1248	12, 15
D1S1656	13, 16
D12S391	18, 19
D2S1338	20, 23
N.A.	UNKNOWN PERSONS

\*PLEASE NOTE THAT THIS REPORT IS NOT INTENDED FOR USE IN COURT PROCEEDINGS

**\*HT18-0537\***  
HT18-0537

**DNA Database Laboratory**  
1013 Whitehorse Rd  
Melbourne 3128  
Tel No. 9490 7777

**Case No.** HT18-0537  
**Agency Reference No.** Test PCR 002 - 002  
**Other Reference No.** Test Other Ref No

**CONFIDENTIAL**

**LABWARE**  
Results Count

Locus	HT18-0537-002
D3S1358	15, 16, 17
VWA	14, 16, 17, 18
D16S539	9, 10, 12
CSF1PO	12, 12
TPOX	8, 11
YINDEL	1, 2
AMEL	X, Y
DBS1179	12, 13, 14
D21S11	29, 31, 32
D18S51	12, 15, 19, 20
DYS391	10, 11
D2S441	12, 14, 15
D19S433	15.2, 16.2, 14, 15
TH01	9.3, 7, 8, 9
FGA	21, (24, 26)
D22S1045	11, 15, 16
D6S818	11, 12
D13S317	8, 11
D7S820	9, 11
SE33	22.2, 25.2, 17, 19
D10S1248	14, (12, 15)
D1S1656	13, 16
D12S391	18, 19, 22
D2S1338	19, (20, 23)
MATCH	UNKNOWN MALE (UNKNOWN FEMALE)

**CONCLUSION:**

The DNA profile obtained from \*\* was found to be a mixed DNA profile comprising at least two persons. Confirmatory identification of any person in this profile is not possible. The DNA profile obtained from was found to be a mixed DNA profile. \*\* can be included as a contributor of the mixed DNA profile. The proportion of the populations, whose individual DNA profiles could be included as contributors of the mixed DNA profile is estimated to be respectively. No match of "Unknown Male" in DNA Database.

**REPORTED BY**

HT18 Reporting Analyst	HT18 Approving Analyst
<reportedBy>	<approvedBy>
Signature and Date	Signature and Date

\*PLEASE NOTE THAT THIS REPORT IS NOT INTENDED FOR USE IN COURT PROCEEDINGS

**\*HT18-0537\***  
HT18-0537

# Quality: Instrument Management

- **Instrument Management**
  - Maintain events to keep instruments in service
    - Service, Maintenance, Calibration, Verification

October 9 2018

Preferences

Set Reset

My Workflows

Stability Designer

Stability Pull

Lot Management

Lot Sampling

Lots To Release

Laboratory

HD Monitor KPI's

Manage Instruments

Laboratory

Reports

Log Scheduled

Log Manual

Log Adhoc

Preference Setting

Site	USNC
Instrument Performance Date Range	7
Instrument Performance Start Time	02/10/2018 09:39:27
Instrument Performance End Time	09/10/2018 09:39:27

Folder

Instrument Performance Checks

Offline Instruments

Name	Description	Vendor	In Service
BAL21	Balance 21	METTLER	1
BAL22	Balance 22	METTLER	1
BAL23	Balance 23	METTLER	1
BAL24	Balance 24	METTLER	1
BAL25	Balance 25	METTLER	1
BAL26	Balance 26	METTLER	1
DM01	Density Meter 01	METTLER	1
DM02	Density Meter 02	METTLER	2

Instrument Performance Samples

Instrument	Sample Number	In Spec	Inst Event	Login Date	Date Completed
No data available in table					

Instrument Calibrations Due By: 09/10/2018 Results Count

Start Date	Due Date	In Service	Instrument ID	Description	Location	Vendor
<b>Air Sampling</b>						
30-Jun-2014	30-Jun-2014	Yes	AIR_SAMPLER_01	Air Sampler 02.	ANALYTICAL	
		No	AIR_SAMPLER_02	Air Sampler 02.	ANALYTICAL	
<b>Balances</b>						
01-May-2016	30-Jun-2016	No	BAL01	Balance 01	ANALYTICAL	METTLER
			Operators: JLAURENCE / AGRAY			
20-Jan-2017	13-Feb-2017	No	BAL02	Balance 02	ANALYTICAL	METTLER
			Operators: JLAURENCE / AGRAY			
20-Jan-2017	09-Feb-2017	No	BAL03	Balance 03	ANALYTICAL	METTLER
			Operators: JLAURENCE / AGRAY			
11-Jul-2015	03-Aug-2015	No	BAL04	Balance 04	ANALYTICAL	METTLER
			Operators: JLAURENCE / AGRAY			
04-Dec-2015	07-Dec-2015	No	BAL07	Balance 07	ANALYTICAL	METTLER
			Operators: JLAURENCE / AGRAY			
26-Sep-2015	26-Sep-2015	No	BAL08	Balance 08	ANALYTICAL	METTLER
			Operators: JLAURENCE / AGRAY			
22-Sep-2014	03-Oct-2014	No	BAL09	Balance 09	ANALYTICAL	METTLER
			Operators: JLAURENCE / AGRAY			
01-Oct-2014	01-Oct-2014	No	BAL11	Balance 11	ANALYTICAL	METTLER
			Operators: JLAURENCE / AGRAY			
01-Oct-2014	01-Oct-2014	No	BAL12	Balance 12	ANALYTICAL	METTLER
			Operators: JLAURENCE / AGRAY			
01-Aug-2015	15-Aug-2015	No	BAL22	Balance 22	ANALYTICAL	METTLER
			Operators: JLAURENCE / AGRAY			
01-Aug-2015	15-Aug-2015	No	BAL23	Balance 23	ANALYTICAL	METTLER
			Operators: JLAURENCE / AGRAY			
05-Mar-2015	05-Mar-2015	No	BAL25	Balance 25	ANALYTICAL	METTLER
			Operators: JLAURENCE / AGRAY			
10-Sep-2015	02-Oct-2015	No	JSBAL	Balance 04	ANALYTICAL	METTLER
			Operators: JLAURENCE / AGRAY			
20-Oct-2015	20-Oct-2015	-	Jen Smith		External Calibration Expiry / By Calibration Verification Date / By	
20-Oct-2015	20-Oct-2015	-	Jen Smith			
<b>Density meters</b>						
21-Sep-2015		No	DM01	Density Meter 01	ANALYTICAL	METTLER
			Operators: AGRAY / JLAURENCE			
21-Jul-2016		No	DM02	Density Meter 02	ANALYTICAL	METTLER
			Operators: AGRAY / JLAURENCE			
15-Sep-2016		Yes	DM03	Density Meter 03	ANALYTICAL	METTLER
			Operators: AGRAY / JLAURENCE			
14-May-2016		Yes	DM04	Density Meter 04	ANALYTICAL	METTLER
			Operators: AGRAY / JLAURENCE			
14-May-2016		Yes	DM05	Density Meter 05	ANALYTICAL	METTLER

# Quality: Standards & Reagents

- **Standards & Reagents Management**
  - Barcode Labels
  - Reception, Opening, Usage

May 23 2016

## Standard and Reagent Inventory Manager

**PREFERENCES**

Set Reset

**My Workflows**

- Stability Designer
- Stability Pull
- Lot Management
- Lot Sampling
- Lots To Release
- Laboratory
- HD Monitor KPI's
- Standard and Reagent Inventory Manager

**LABEL**

Small Label Big Label

**REPORT**

Report Re-Order

Export to Excel

New Arrival → Open Bottle / Reduce Qty → Change Location → Dispose

Search

Stock							Search:
Add Stock	View Stock	Edit Details	Stock	Description	Type	Quantity	Units
+			COLUMN_A		Column		pieces
+			GLASSWARE	Glassware example (no tests, manage by qty, reorder on qty)	Glassware		pieces
+			SALT	Salt	Reagent		g
+			SOLUTION1	Lab solution 1 demo (2 ingredients)	Lab solution		mL
+			STD_A	Standard A (no test, create active, by quantity)	Standard		g
+			STD_B	standard B (by container, test from S&R template, create active)	Standard		g

# Conclusions

- ***Together with its customers, LabWare has created a comprehensive Vertical Solution that helps to automate forensic DNA laboratories.***
- ***It comprises the main forensic requirements***
  - Case Management
  - Exhibits Management
  - DNA Analyses
  - Profile Management
  - Quality Requirements according to ISO 17.025
- ***High volumes of sample throughput are achieved***
  - > 200.000 samples / year have been achieved by our customers
  - Using a secure and validated system.



# Questions?

