1. Scope

This procedure provides general guidelines for the receipt, analysis, and disposition of toxicological evidence for cases assigned to the Toxicology Unit (TU) within the Chemical Analysis Section (CAS) of the Division of Scientific Services' (DSS) forensic laboratory. These guidelines are based on recommendations set forth within a number of reference documents such as, but not limited to:

- DSS laboratory Quality Manual procedures
- American Society of Crime Laboratory Directors / Laboratory Accreditation Board (ASCLD/LAB) Accreditation Manual
- ASCLD/LAB-International Supplemental Requirements
- International Organization of Standardization (ISO) / International Electrotechnical Commission (IEC) 17025 Requirements
- Society of Forensic Toxicologists (SOFT)/American Academy of Forensic Sciences (AAFS) Forensic Toxicology Laboratory Guidelines
- American Board of Forensic Toxicology (ABFT) Laboratory Accreditation Manual
- Drug Abuse Handbook
- Poison Detection in Human Organs
- Introduction to Forensic Toxicology
- Principles of Forensic Toxicology, Handbook of Analytical Toxicology

2. Equipment/Materials/Reagents

Not applicable. Guidance for preparing reagents and the utilization of instruments/equipment may be found in specific toxicological procedures.

3. Standards and Controls

Not applicable. Guidance for preparing standards and controls (e.g., positive and negative) may be found within specific toxicological procedures.

4. Calibration

Not applicable. Guidance for calibration may be found within specific instrumental procedures.

5. Sampling

The most common types of toxicological specimens for antemortem analyses are urine and blood (sometimes plasma or serum will be submitted). For postmortem analyses only blood,

urine, and/or vitreous humor will be analyzed (if plasma or serum are submitted they will be treated like blood specimens and will be analyzed accordingly). Prior to sampling, containers should be inverted or swirled to ensure homogeneity. If blood samples are found to be clotted, such clots may need to be removed or homogenized/broken-up (as best as possible) before sampling occurs. The determination of whether blood clots will be removed or analyzed and the process of ensuring homogeneity of clotted samples will be done on an as-needed basis and will involve a Lead Examiner or higher.

Blood samples may be received in multiple tubes. When blood has been reportedly collected at the same time interval and from the same location/person, and has been in the same type of test tube (i.e., red top), it may be considered the same item and be given the same item number during accessioning (e.g., Item#001-A1 – blood within two (2) red top tubes). In these circumstances the tubes can be further labeled to distinguish the tubes from one another. Any sampling from the separate tubes will be described within applicable case note documents by the analyst who handles the evidence. Situations where it is not clear whether multiple tubes of blood should be considered one item or multiple items will up to the Lead Examiner or higher to decide. Any clarification or justification for such actions and/or decisions will be appropriately recorded.

6. Procedure

6.1. Sample Collection, Receipt, and Transfer

The proper selection, collection, and submission of biological specimens for toxicological analyses is important for scientifically sound interpretation of analytical data. While there are recommended minimal amounts for specific types of specimens in order to adequately perform routine toxicological examinations (e.g., human performance cases: blood = 15mL ; urine = 100mL), specimen amounts are often limited and the recommended minimal amounts may not always be met by submitting agencies. In cases where limited sample amounts are received by the DSS laboratory, the type and amount of specimen submitted may dictate the type and number of analyses that are to be performed. In such situations, it will be up to the Lead Examiner(s) to work with the analysts, as well as with the submitting agencies, in deciding which analytical path will be pursued.

When blood is analyzed for containing certain drug classes (e.g., cocaine, ethanol), it is advantageous if the specimen is mixed with chemicals so as to enhance the stability of analytes. This can be accomplished by using specimen tubes that contain preservatives and/or anticoagulants. For most toxicology cases, the preferred collection tube is a grey-top Vacutainer®, which contains a mixture of sodium fluoride and potassium oxalate.

Containers with specimens collected from a living person should be found labeled with appropriate information (e.g., source name, time/date of collection). Biological specimens should be submitted to the DSS laboratory in separate individual packages, under proper [evidentiary] seal, with appropriate warning labels, under a single communication (i.e., Request for Analysis (RFA) form), and should be submitted in a refrigerated or frozen condition. Typically such evidence is found submitted within some sort of kit and/or paperwork (e.g., DUI kit, CT400 kit, DPS-0009-C, copy of medical records).

Such evidence will typically be received through the Evidence Receiving Unit of the DSS laboratory. Proper seal of evidence refers to a condition of packaging which ensures evidence is prevented from cross contamination, there is no sample loss, and any attempt at deleterious change of the evidence would be noticeable.

After initially receiving a toxicology case the evidence will be inventoried and information will be entered into JusticeTrax (JT). The information can include, but not be limited to: type of specimen(s) received, any labeling present on the containers, the approximate specimen amounts, and any damage to or leaks from the containers. The specimen containers will be labeled with appropriate information from JT (e.g., item number(s) and the Laboratory Number). Any problems or issues with evidence will be addressed at the time of inventory, will be documented appropriately, and can involve a Lead Examiner, Assistant Director, Deputy Director, or designee. Pictures may be taken to document the evidence and any picture should contain the lab number, the date, and the analyst's initials. Contributors may be contacted, if appropriate, for minor issues and will be contacted if sample loss or sample integrity issues occurred prior to accessioning of evidence.

Evidence transfer will involve adequate chain-of-custody (CoC) documentation and will usually be documented within the laboratory information management system (LIMS) software (e.g., JusticeTrax (JT)). If evidence is transferred to multiple analysts for the purpose of aliquoting samples, then evidence does not necessarily need to be under proper seal between transfers (evidence must be free of sample loss and free of possible contamination). However, any transfer of possession of evidence does need to be tracked with respect to CoC to ensure that proper accountability is recorded among analysts. If aliquoted portions of a sample are to be consumed during analyses, then each portion will be considered the same item from which it originally came and the same item number will be used. For example: suppose Item #001-A1 blood is going to be tested for ethanol by Analyst A, and then be screened for drugs by Analyst B. Analyst A takes possession of Item #001-A1 and aliquots out 0.5 mL of blood into a headspace vial. Then Analyst A aliquots 0.5 mL of Item #001-A1 into a test tube for Analyst B to do their future drug screening. Both the original Item #001-A1 and the aliquoted [0.5 mL] drug screen sample (still labeled as Item #001-A1, but noted to be

for the drug screen) are placed under proper seal and transferred to an evidence refrigerator. Analyst B comes at a later time and transfers the aliquoted Item #001-A1 tube (the one flagged for drug screen) from the refrigerator to themselves and uses all of the sample for the drug analysis. In the unusual circumstance that an extract from an item will need to be retained (e.g., all the blood has been consumed and the extract needs to be saved), then the extract will be sub-itemized (e.g., Item #001-A1-01).

6.2. Sample Storage

Due to the nature of biological material, specimens will be kept refrigerated or frozen and under proper seal when not under active examination. Refrigerators and freezers are located in the Toxicology Unit for evidence storage and shall be appropriately secured within a lockable system. Other areas, if acceptable for evidence storage, may be used to store evidence (e.g., refrigerators and freezers in other areas of the laboratory).

6.3. Analytical Schemes for Toxicology Testing

Forensic toxicological examinations are conducted on a variety of specimens in order to detect a wide range of drugs and other substances. The Lead Examiner, Assistant Director, Deputy Director, or designee will be responsible for evaluating cases prior to a report being issued in order to ensure completeness, good case management, and quality. Refer to specific case types for more guidance. If limited volume evidence or multiple types of evidence are received (e.g., multiple blood tube types, multiple serum tubes), a lead Examiner (or higher), as well as possibly the submitting agency, should be consulted so as to create an analytical scheme determining what evidence will be analyzed in order to maximize efficiency and completeness.

Suspected DUI Cases: Many examinations within the Unit involve antemortem specimens from routine driving under the influence (DUI) investigations wherein ethanol and/or impaired-driving drugs are sought out in order to be detected and identified. While quantitation of analytes within blood samples may be performed, quantitation involving urine specimens is not done. Biological evidence can also be submitted from motor vehicle accident investigations which involve injuries or fatalities and where DUI is suspected. Blood-ethanol determinations and a screening process for recreational/prescription drugs is usually necessary. Relevant positive findings can either be presumptively reported or can be confirmed and quantitated as needed. Because of the need by customers to have ethanol results reported as soon as possible, ethanol analyses on DUI-related cases are normally issued separately than drug reports from the same submission.. While drug reports that are issued after ethanol reports are technically considered supplemental reports for the submission, it is not a requirement that such verbiage be listed on the report. Analytical schemes differ depending on the type of DUI case that is submitted (i.e., non-injury, injury/hospital-

related, fatal). Tables can be found which summarize the general analytical scheme for ante-mortem specimens that are analyzed from DUI cases. See figures for generalized schemes.

Suspected DFSA cases: Other types of cases within the Toxicology Unit may involve biological evidence from suspected drug-facilitated sexual assault (DFSA)-type cases. Evidence from these cases will often involve the submission of both urine (recommended) and blood samples. These cases involve analyzing samples for recreational drugs, ethanol, central nervous system depressants (e.g., benzodiazepines, barbiturates), and hallucinogenic compounds. Additional information (e.g., from CT-100 sexual assault kits) may be needed. All DFSA cases will involve confirmatory analytical techniques in addition to any presumptive techniques which may be used. Reports involving presumptive testing only will not be issued for these type of cases. See Figure 3 for a generalized scheme. All DSFA cases should be completed within 60 days in order to conform to statutes related to sexual assault evidence analysis.

Postmortem cases: Specimens from expired individuals may be received (e.g., from the Office of the Chief Medical Examiner (OCME) or another entity) and will usually be limited to homicides, motor vehicle accidents, and traumatic suicides (when deemed appropriate by the OCME). Specimens from these cases usually include blood, urine, and vitreous humor. If applicable, a memorandum of understanding (MOU) should be followed with regards to case management and which analytes are to be screened, confirmed, and/or quantitated.

All case histories should be thoroughly reviewed upon accessioning of the evidence and by the lead Examiner, or designee. Most routine cases should only need a brief understanding of the history within the request. Certain cases may require a thorough review of the case history (e.g., OCME, sexual assaults). Professional judgment will be used to determine the sequence of assays which will be performed for any given case. The scheme within the figures should be followed. Lead Examiners, the Assistant Director, and/or the Deputy Director should be consulted for guidance. All confirmations and quantitations, when not involving routine controlled substances, should be vetted through a lead Examiner or higher before allowing additional work to be done.

Other Cases: While the majority of submissions within the DSS laboratory's Toxicology Unit will be from suspected DUI, suspected DFSA, or postmortem type cases, this procedure doesn't preclude other types of cases involving human biological materials to be examined within the Unit (e.g., serum-conversions, proficiency tests).

As new technology is acquired, general schemes may change for the different types of cases and for the specimens that are received and processed within the Toxicology Unit. Some techniques may be substituted, as necessary, and presumptive and

confirmatory analyses may be combined into a single step during the examination process.

6.3.1. Urine

Suspected DUI Cases: Urine samples from suspected DUI cases are usually submitted when either breathalyzer results are unavailable or when it is suspected that ethanol may not be the sole contributing factor within the investigation. Generally the analytical scheme for urine samples from suspected DUI cases involves qualitative analyses only. An ethanol analysis determination, a liquid chromatographic/mass spectrometric (LC/MS), and/or presumptive screening (e.g. immunoassay) is often done. Given certain situations (e.g., when ethanol is identified within urine at greater than 0.1 g%), drugs detected through a screening examination may be reported as presumptive and without confirmatory techniques being used for identification. In such cases submitting agencies will have an opportunity to request further [confirmatory] analyses by contacting the DSS laboratory. If ethanol was determined to be less than 0.1 g% (or not identified at all) within urine specimens, and no drugs were detected during the presumptive screening examinations, then further [confirmatory] testing should commence before a final drug report is released. If LC/MS analyses were performed, then no further testing may be necessary. Because of the way Connecticut statutes have been written, and because other entities need ethanol results in a timely fashion (e.g., Department of Motor Vehicle attorneys), reports only indicating qualitative/quantitative ethanol results can be issued separately than drug result reports. Quantitation of drugs (other than ethanol) within urine samples will not be done unless prior approval is obtained from a lead Examiner or higher.

Suspected Drug-Facilitated Sexual Assault (DFSA) Cases: Urine is the recommended type of sample for these cases and should be obtained from the victim as soon as possible. Urine specimens in these cases will be qualitatively tested in order to detect possible past-ingestion of drugs and/or alcohol. For gammahydroxybutyric acid (GHB), urine collection times must be less than 12 hours from the suspected drugging/incident. Ethanol should not be analyzed within urine specimens if urine specimen collection times are greater than 48 hours after the incident. Samples that have been collected 5 days after the alleged incident will not be analyzed without prior approval from either the Lead Examiner, Assistant Director, or the Deputy Director. Quantitation of drugs within urine samples will not be done unless prior approval is obtained from the Lead Examiner or higher.

Postmortem Cases: Urine samples may be submitted and analyzed to supplement findings from evidence of other sample matrices (e.g., 6-monoacetylmorphine (6-MAM) for possible heroin usage). Such samples may also be analyzed for other classes and types of drugs. Additionally in these situations, such urine specimens will be qualitatively analyzed for amphetamines, barbiturates, benzodiazepines, cannabinoids, cocaine/metabolites, fentanyl/metabolites, methadone/metabolites, opiates, oxycodone/oxymorphone, and phencyclidine (e.g., immunoassay or LC/MS).

6.3.2. Blood

Suspected DUI Cases: While not as frequent as urine in DUI-type cases, blood samples are the preferred matrix since such samples tend to give information relating to influence of chemicals at the time of the incident. Based on the request and based on the case history, analyses of these samples usually begins with qualitative/quantitative detection for ethanol and/or an abbreviated drugs-of-abuse [qualitative] screening for drug class type (e.g., opiates, benzodiazepines). Blood analyses end with confirmation-type qualitative exams for drugs. Toxicologically significant and relevant drugs within blood specimens may be quantitated based on the original request and, if necessary, based on further communication with the submitting agency's representative. Consultation with a Lead Examiner (or higher) should be considered when determining when analytes should be quantitated.

Suspected Drug-Facilitated Sexual Assault (DFSA) Cases: These cases may call for routine screens of blood for recreational drugs, ethanol, and other central nervous system depressants (e.g., benzodiazepines, barbiturates). Targeted screens for certain DFSA drugs (e.g., GHB, flunitrazepam) may also be necessary. Relevant drugs within blood specimens are quantitated based on the original request and, if need be, based on further communication with the submitting agency's representative. Blood specimens should not be analyzed for GHB if their collection times are greater than 8 hours after the time of drugging/incident. Ethanol should not be analyzed within blood specimens if their collection times are greater than 24 hours after the incident. Samples that have been collected 5 days after the alleged incident will not be analyzed. Because these types of cases can be unusual and non-routine, consultation with the Lead Examiner or higher should be considered when determining which tests to be included during the development of an analytical plan or scheme.

Postmortem Cases: Antemortem blood evidence is the most preferred sample as their results give the most relevant information. Depending on the submitting agency, limited drugs/metabolites may be sought (e.g., OCME and

the MOU). Quantitation of drugs/metabolites, when necessary, is typically performed within blood samples. The Lead Examiner (and/or higher) will be consulted when questions arise in determining the best analytical scheme if limited samples and/or unusual circumstances arise.

6.3.3. Vitreous Humor/Fluid:

Postmortem Cases: Vitreous fluid samples may be submitted and analyzed to supplement findings from other sample matrices. When positive ethanol findings within blood specimens occur, confirmation of ethanol will be achieved through the quantitative analyses of associated vitreous fluid specimens. When morphine is identified in a blood sample and there is no associated urine sample submitted with the case, the vitreous sample will be qualitatively analyzed for 6-acetylmorphine (aka: 6-monoacetylmorphine (6-MAM)), to indicate possible heroin use.

6.4. Analytical Schemes for Screening Tests

Most analytical schemes begin with the use of screening protocols for drug class determination. Commonly employed toxicological screening techniques include, but are not limited to, immunoassays, extractions, or headspace analyses using selective detectors on gas chromatographs. A list of analytes that are commonly screened in the Toxicology Unit using immunoassay and/or headspace gas chromatography can be seen in Table 1. Additional analytes may be added, as necessary.

Table 1: Analytes which can be Routinely Screened for within DUI Cases

Ethanol	Benzodiazepines	Cocaine	Oxycodone
Amphetamines	Buprenorphine	Methadone	Phencyclidine (PCP)
Barbiturates	Cannabinoids (Δ^9-THC)	Opioids	

Alternatively, confirmatory techniques (e.g., gas chromatography/mass spectrometry (GC/MS), liquid chromatography/mass spectrometry (LC/MS)) can be used to screen samples for drugs/metabolites. When agreed upon by a submitting agency, analyses may be limited to only selected analytes (e.g., based on the OCME MOU). Even though LC/MS is a confirmatory technique, certain experiments may be used within the instrument which allow it to rapidly examine specimens and be used for screening purposes. Table 2 lists drugs/metabolites which have been agreed, based on an MOU, to be commonly screened for during the analysis of OCME samples. When a confirmatory technique is used in lieu of a screening technique, and the experiment contains sufficient information to qualitatively identify compound(s), analysis of a second aliquot for confirmation purposes is not required. If necessary, the Lead

Examiner and/or higher should be consulted to determine if further confirmatory testing is needed.

The purpose of screening techniques, especially in DUI cases, is to help rule-out the possible presence of analytes at certain detectable limits. When screening results are negative it indicates that certain analytes/classes of analytes are not detected. When screening results are positive it indicates that certain analytes/classes of analytes are present and that further testing may be warranted. Screening, sometimes referred to as presumptive, should have minimum detection limits for analytes of interest that include therapeutic concentration ranges for drugs. The selection of the screening technique(s) usually depends upon the case type, the amount of available specimen, and what questions need to be answered for the submitting agency.

There are some situations wherein urine samples may only be analyzed by a screening technique and a report will be issued listing presumptive results (e.g., non-serious injury, non-fatal DUI, non-sexual assault). In those situations, when presumptively positive, a second aliquot of urine is typically analyzed to ensure accuracy in the findings. Presumptive-positive drug results (e.g., from immunoassay data) within urine samples may be reported without confirmatory analyses being performed. In those situations a qualifying statement will accompany the report advising the reader that such results are only presumptive.

6.5. Analytical Schemes for Confirmatory Tests (see figures)

In the case of LC/MS and GC/MS, chromatography and mass spectrometry are considered two orthogonal techniques. Additionally, a different MS experiment may also be considered an orthogonal technique (e.g., full scan versus MS/MS versus selected ion monitoring (SIM)). Often, confirmatory tests for targeted analytes are more specific than screening assays which are used for initial detection. All confirmatory tests will include the use of positive and negative controls for the analyte(s) of interest. Positive control(s), however, need not be analyzed within the same batch/sequence as unknown samples as long as the positive control(s) are analyzed under the same analytical conditions and conform to quality control criteria found within specific experimental methods. When a screening technique indicates the possible presence of an analyte in a specimen (e.g., urine), confirmation of the identity of the analyte in a second aliquot from the same specimen is acceptable. Whenever possible and practical, the use of mass spectrometry is recommended as a confirmatory technique.

Table 2: Analytes Routinely Screened and/or Quantitated within Postmortem Cases

11-Hydroxy Delta-9 THC	Desalkylflurazepam	Methylephedrine
6-Monoacetylmorphine$_{(free)}$	Diazepam	Midazolam
Acetone	Dihydrocodeine / Hydrocodol$_{(free)}$	Morphine$_{(free)}$
Alpha-Hydroxyalprazolam	Diphenhydramine*	Norbuprenorphine$_{(free)}$
Alprazolam	EDDP	Nordiazepam
7-Aminoclonazepam	Ephedrine/Pseudoephedrine	Norfentanyl
Amobarbital	Estazolam	Norpropoxyphene
Amphetamine	Etizolam	Oxazepam
Barbiturates	Fentanyl	Oxycodone$_{(free)}$
Benzoylecgonine	Flurazepam	Oxymorphone$_{(free)}$
Blood Alcohol Concentration (BAC)	Hydrocodone$_{(free)}$	Pentobarbital
Buprenorphine$_{(free)}$	Hydromorphone$_{(free)}$	Phencyclidine
Butabarbital	Hydroxyethylflurazepam	Phendimetrazine
Butalbital	Hydroxytriazolam	Phenmetrazine
Cannabinoids	Isopropanol	Phenobarbital
Chlordiazepoxide	Lorazepam	Phentermine
Clobazam	MDA	Phenylpropanolamine
Clonazepam	MDMA	Propoxyphene
Cocaethylene	MDEA	Secobarbital
Cocaine	Methadone	Selegiline
Codeine$_{(free)}$	Methamphetamine	Temazepam
Delta-9 Carboxy THC	Methanol	Triazolam
Delta-9 THC	Methorphan (Dextro/Levo)*	Zolpidem

*May only be detected when using LC/MS (detection by immunoassay dependent on concentration)

When urine samples are positive for ethanol after presumptive testing is done (i.e., EMIT), then confirmatory testing for ethanol will be done. Depending on the situation and the amount of ethanol found within the specimen, further analyses for drugs may be performed.

While evidence from sexual assault, fatal-DUI, and serious injury-DUI cases (i.e., sources go to hospital) may be initially analyzed by presumptive techniques, confirmatory techniques will be used for these cases, when applicable. In cases where the the presumptive technique also provides confirmatory results (e.g., accurate mass-LC/MS) additional confirmatory analyses may not be required. Limited sample or other situations may influence the number of tests that will be applied to certain evidence. Good laboratory practice and sound judgement will be used by analysts when evaluating and deciding on analytical plans. The Lead Examiner (or higher) will

be notified of any unusual situations or when potential problems exist with analytical schemes.

6.6. Analytical Schemes for Quantitations (see figures)

Quantitation is performed on analytes based on importance to a case (as determined by case history, specimen volume, specimen type, and toxicological significance) and based on agreement with submitting agencies (e.g., MOU with OCME). Table 2 lists drugs/metabolites which may be quantitated within OCME postmortem samples. Appropriate internal standards (e.g., deuterated) and controls (positive/negative) are used within each batch/sequence.

Figure 1: Analytical Scheme for DUI Antemortem Cases (Urine)

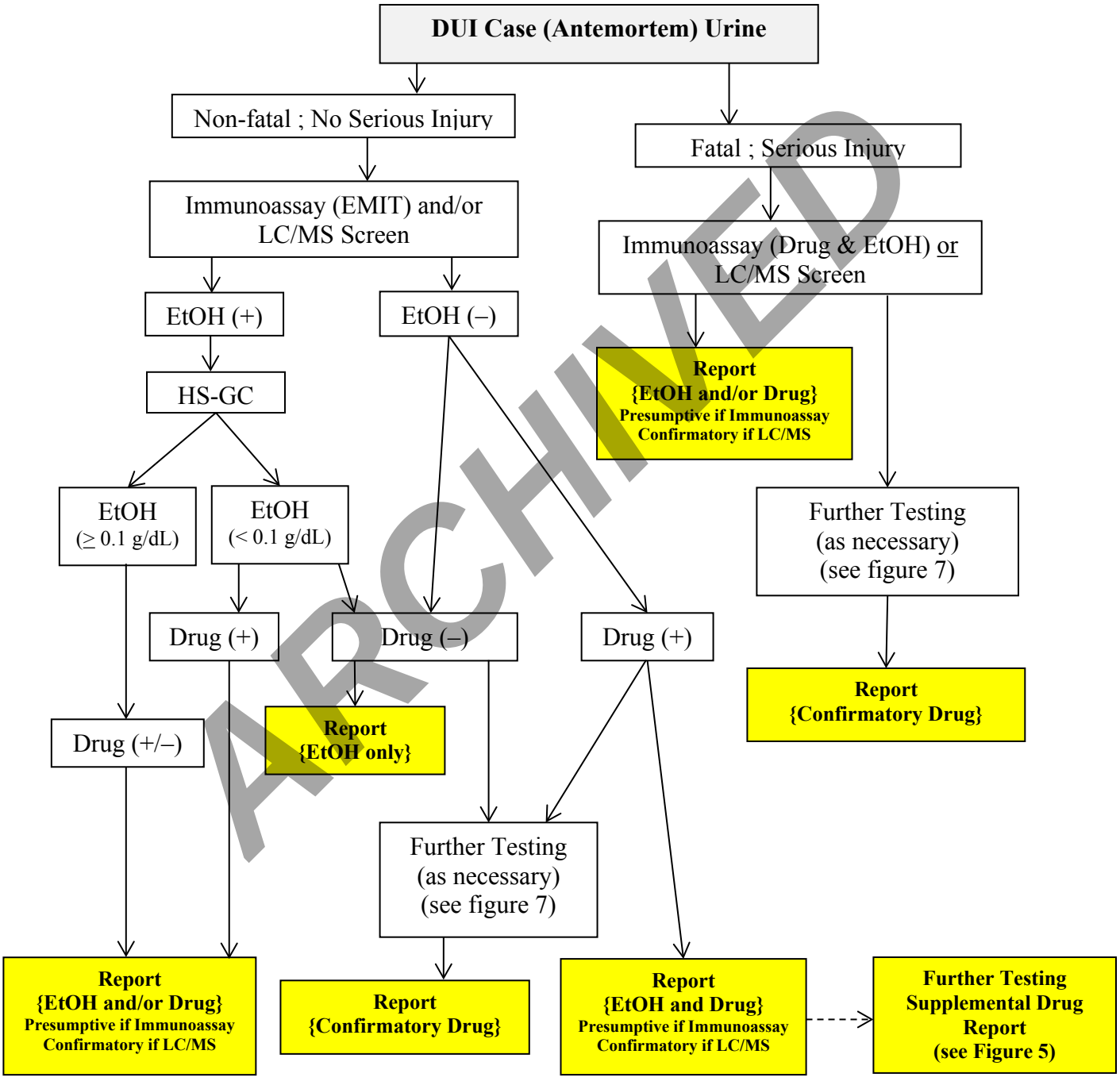


Figure 2: Analytical Scheme for DUI Antemortem Cases (Blood)

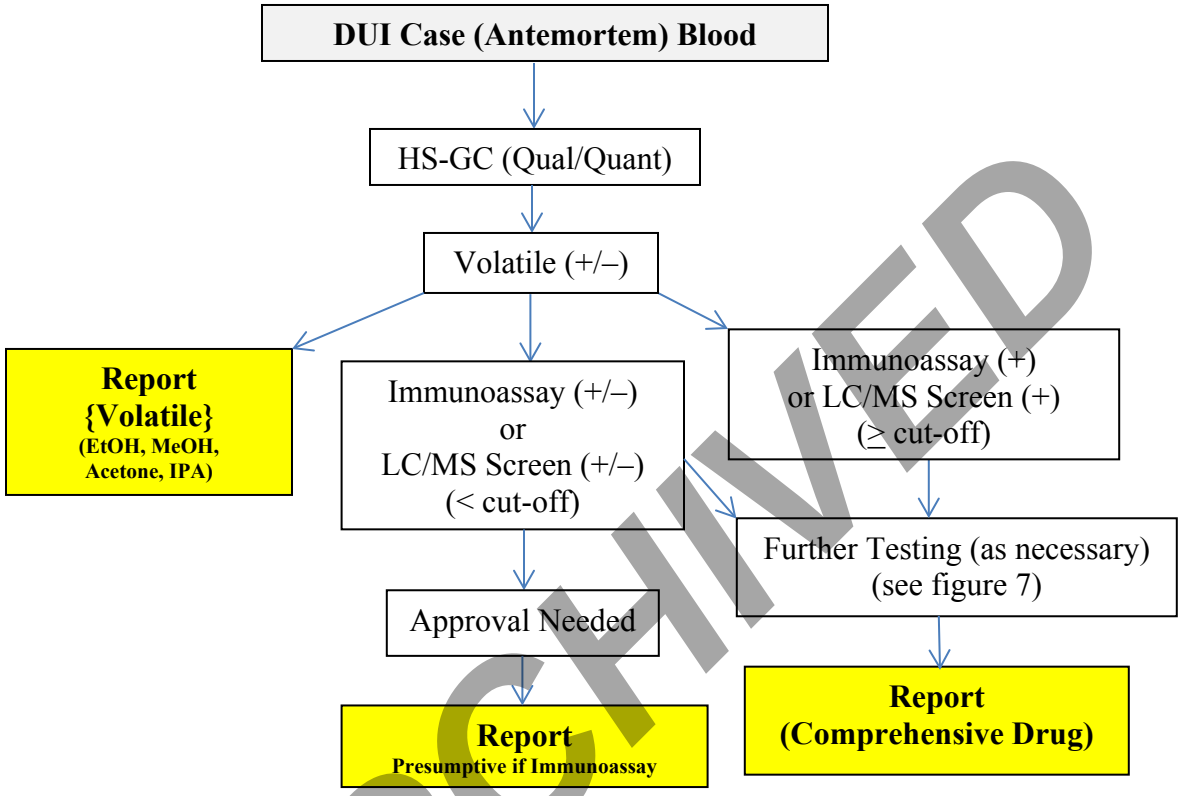


Figure 3: Analytical Scheme for Drug-Facilitated Sexual Assault Cases (Blood / Urine)

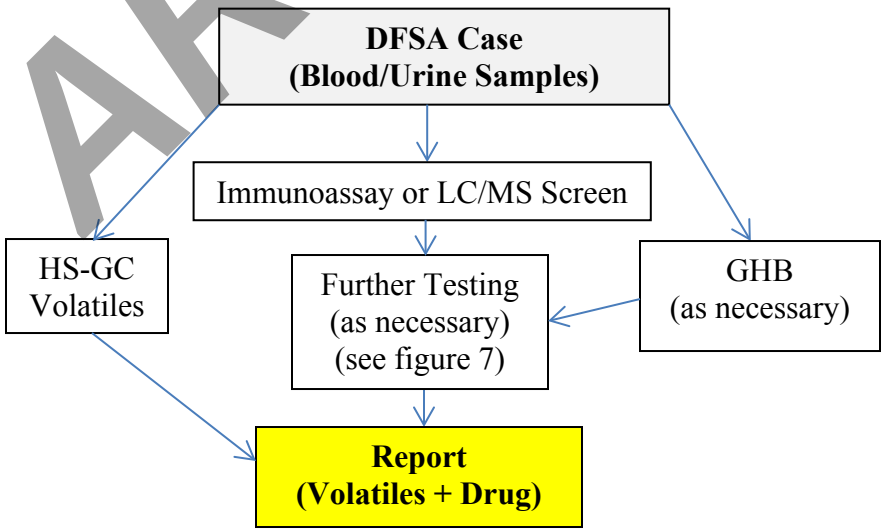


Figure 4: Analytical Scheme for Postmortem Cases (Blood, Urine, Vitreous Fluid)

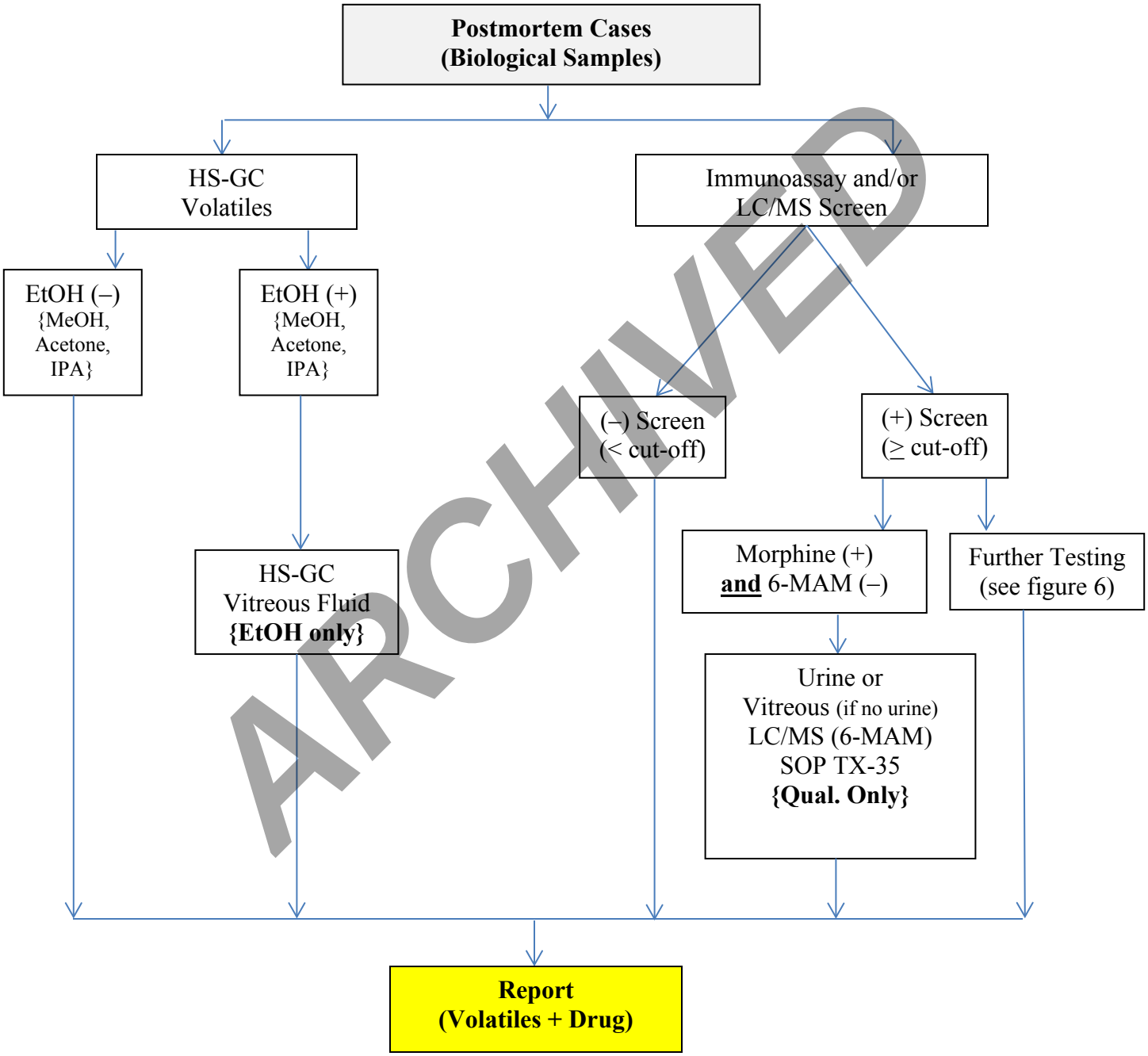


Figure 5: Analytical Scheme for Antemortem Cases (Supplemental/Confirmation – Urine)

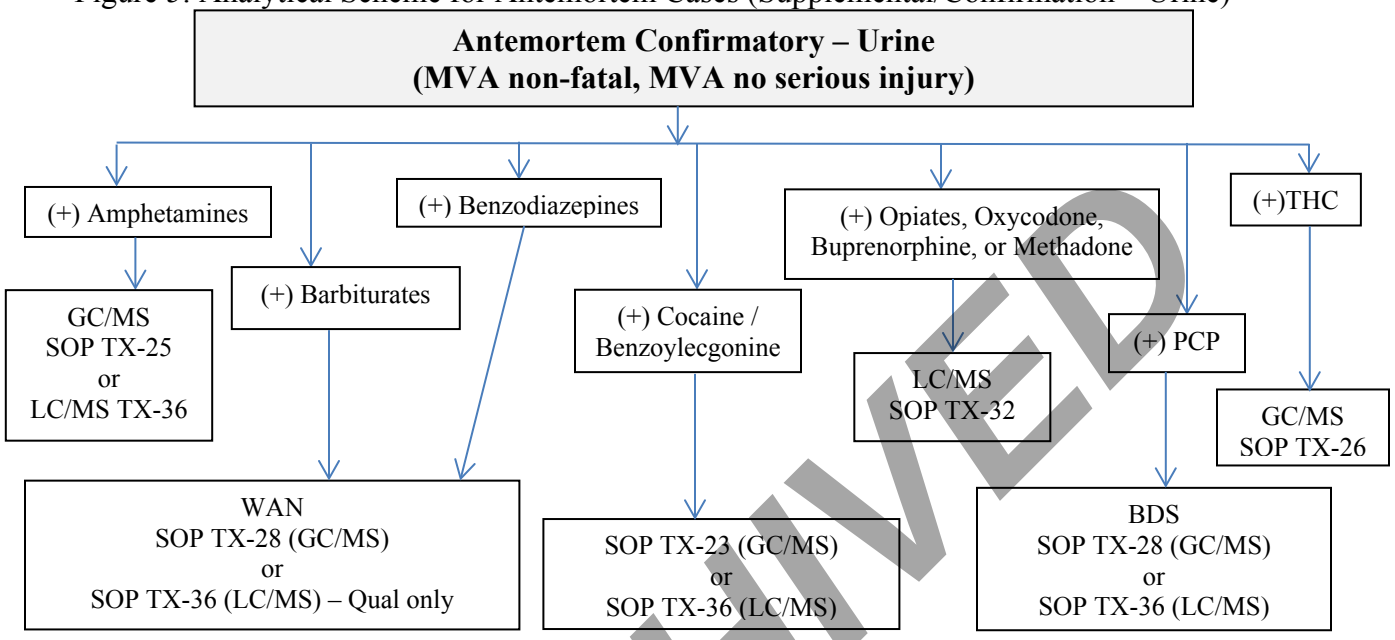


Figure 6: Analysis Scheme for Postmortem Cases (Further Testing Confirmation – Blood)

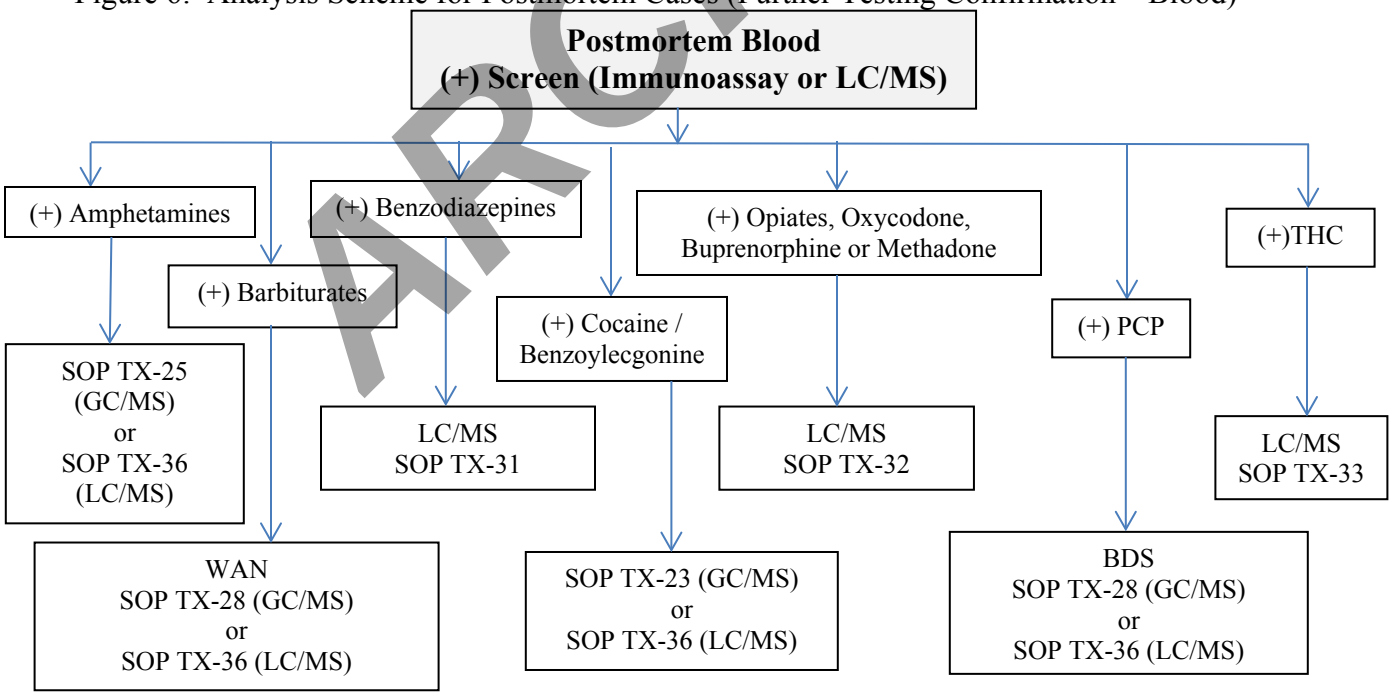
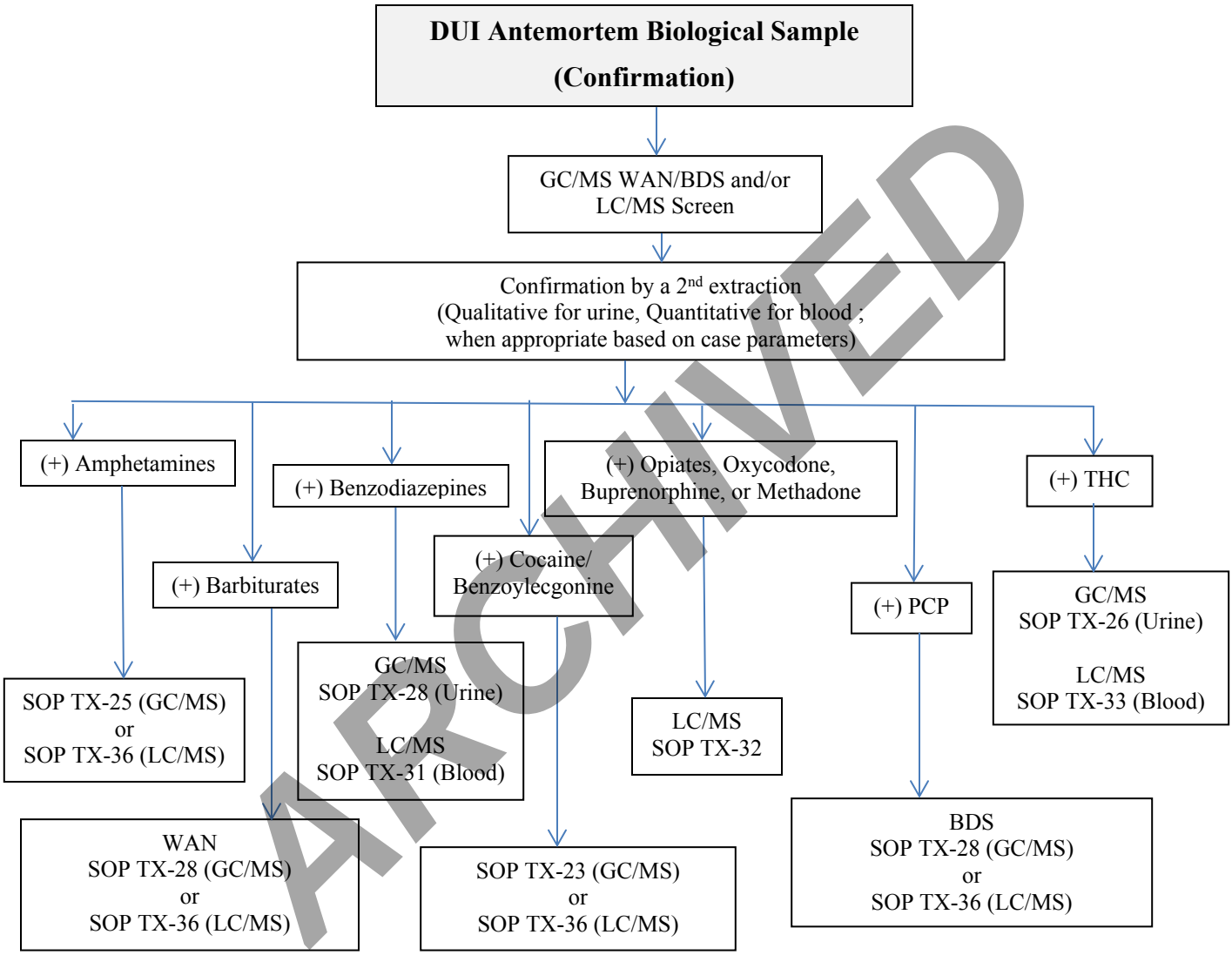


Figure 7: Analytical Scheme for DUI Antemortem Cases (Confirmation – Blood/Urine)



7. Uncertainty

Procedural uncertainty is reported with all quantitative results and should be evaluated annually. The overall uncertainties can be calculated based on an evaluation of control performance (variance). Documentation of the calculation of uncertainty can be maintained in a notebook in the laboratory. Included in this notebook should be documentation (or appropriate references) of reference materials and equipment utilized in the procedure that

could affect the quantitative accuracy of the method. For analytes where there is no historical data to determine uncertainty, and the analyte does not fall into a class of drugs where uncertainty has been established, uncertainty can be reported based on the response of batch controls.

8. Reagent Validation

When a new lot of a solvent or reagent is needed they will be appropriately validated prior to use. Analysts will verify that reagents/solutions worked as expected and that there were no interfering or unexpected results observed. Documentation for the acceptability will be appropriately retained (e.g., within batch documentation, logbook). A solution is considered validated and acceptable for use when the solution is shown to have worked in the procedure, and blanks/negative controls are shown not to contain contaminants that will interfere with the overall findings. Documentation should include recording the validation of the reagent on the batch runsheet and having the batch reviewed. Completing the Reagent Logbook, includes stating the name of the reagent/solution, lot number, the date made by who, and the date it was validated. If created in-house, the lot number should include information related to date made and preparer's initials (e.g., MPR07212016). If the same solution is made using different reagents or at different times during the same day, lot numbers can be differentiated using hyphenated letters (e.g., JJ07042016-a, JJ07042016-b). Solutions may be marked with a colored sticker (e.g., green) according to which method the solution is validated for, the date validated (the batch date), and the analyst's initials.
For materials that are purchased in multi-bottle lots, once one bottle from the lot is found to be acceptable for a particular use, all the bottles in the lot can also be marked as validated for that use (or related use, as appropriate). Bottles with working solutions will be labeled with appropriate information (e.g., solution name, lot number (if generated in-house will include data and initials of preparer), expiration date (if applicable and if different than the standard one year from date of validation), initials (if different from in-house lot number), colored label (e.g., green) with validation information, applicable safety information. When applicable, quality control solutions (e.g., controls. calibrators) should be purchased. If solutions need to be made in-house, good quality assurance practices will be employed (e.g., varying reagent lot numbers, varying calibrator solutions, recording trend lines, verifying newly prepared solutions against older solutions)

9. Abbreviations

The following abbreviations may be found in the procedures and case notes within the Toxicology Unit:

DUI	Driving Under the Influence
DOC	Department of Corrections

DFSA	Drug Facilitated Sexual Assault
EtOH	Ethanol
MeOH	Methanol
IPA	Isopropanol
RT	Retention time
EMIT	Enzyme Multiplied Immunoassay Technique
GC MS	Gas Chromatography Mass Spectroscopy
IR	Infrared
UV	Ultraviolet
LC MS	Liquid Chromatography Mass Spectroscopy
TX	Toxicology
CS	Controlled Substances
WAN	Weak Acid Neutral
BDS	Basic Drug Screen
BL	Blood
UR	Urine
CHEP	Cyproheptadine
DI H2O	De ionized Water
Neg	Negative
NDD	No Drugs Detected
SA	Sexual Assault
Coc	Cocaine
BE	Benzoylecgonine
Op	Opioids
THC	Delta-9-Tetrahydrocannabinol
COOH-THC	Carboxy-delta-9-tetrahydrocannabinol
THC-OH	11-Hydroxy-delta-9-tetrahydrocannabinol (11-OH-THC, OH-THC)
Benzo	Benzodiazepine
SMA	Sympathomimetic Amines
GHB	Gammahydroxybutyrate or gammahydroxybutyric acid
OCME	Office of the Chief Medical Examiner
MOU	Memorandum of Understanding

10. References

DSS Quality Manual

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Rev. #	History
3	Updated verbiage and formatting within the entire document. Inserted figures and tables to summarize schemes. Inserted information about OCME samples. Removed unnecessary verbiage throughout document. Added schematic figures to summarize methodology. Added History section.
4	Updated verbiage. grammar, and formatting within the entire document. Added 'Assistant Director' throughout document. Updated to allow for either LC/MS Screening or Immunoassay techniques as an initial screeing tool. Clarified that the use of LC/MS as a screening tool may not require further analysis. Updated flow charts to include LC/MS Screen and other LC/MS Quantitative methods. Removed bias from consideration of Uncertainty. Added limitation statement within Table 2. Updated section 6.5 and the figures.