

Scientific Laboratory Division News Summer 2013

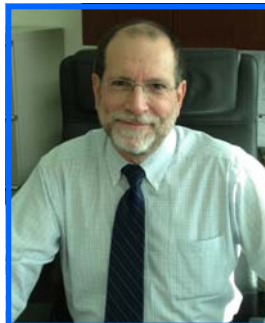


NEW MEXICO SCIENTIFIC LABORATORIES

volume 11, issue 1

From the Director: David Mills, Ph.D., HCLD

Who are you? The SLD first started its Newsletter, back in the Fall of 2008, as a means of increasing communication with you- our clients, customers and partners- and to share information and stories that we thought would be both of interest and use to you. If you have received this newsletter over the years, you have undoubtedly noticed the broad range of topics covered, ranging from technical aspects of laboratory analysis to public policy and regulations, infectious diseases to environmental testing and from adverse drug reactions to forest fires. The breadth and variety of articles covered over time mirror the breadth and variety of individuals, programs and agencies served by the Scientific Laboratory Division under its Statutory mandates. In other words, the breadth reflects “you”. So, just exactly *who are you?*



The SLD is a consolidated state laboratory, which means that it has co-located numerous laboratories (our three scientific bureaus have 15 separate laboratories!) that in many, if not most, other states are scattered among numerous agencies. The work performed here at SLD includes testing for infectious diseases in humans, livestock, wildlife- living and dead- as well as dairy products, foods and environmental samples. It includes testing for chemical hazards and toxins on air, water, soil, sewage, dairy products and biological tissues and it includes testing for public health surveillance, regulatory monitoring, outbreak and emergency response. With this broad range of services to so many programs, *you* are quite a varied group!

To give you a sense of who you might be, Figure 1 (page 2) illustrates the clients, customers and professional partners of the SLD. The colored boxes in the figure illustrate the major foci of the 3 scientific bureaus at SLD and include for each a brief description of the major emphasis for testing and the external accrediting/certifying body for that unit. The color-coded circles indicate major partners and clients of each bureau and one of these circles very likely describes you.

So, now that you know who you are, I welcome you to the Spring issue of the SLD newsletter!

NEW MEXICO DEPARTMENT OF HEALTH

Celina Phelps, Editor

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SLD Mission Statement

The mission of the Scientific Laboratory Division is to provide analytical laboratory support and scientific advisement services for tax-supported agencies and groups or entities administering health and environmental programs for New Mexico citizens.

SLD CLIENTS

Analytical Responsibilities

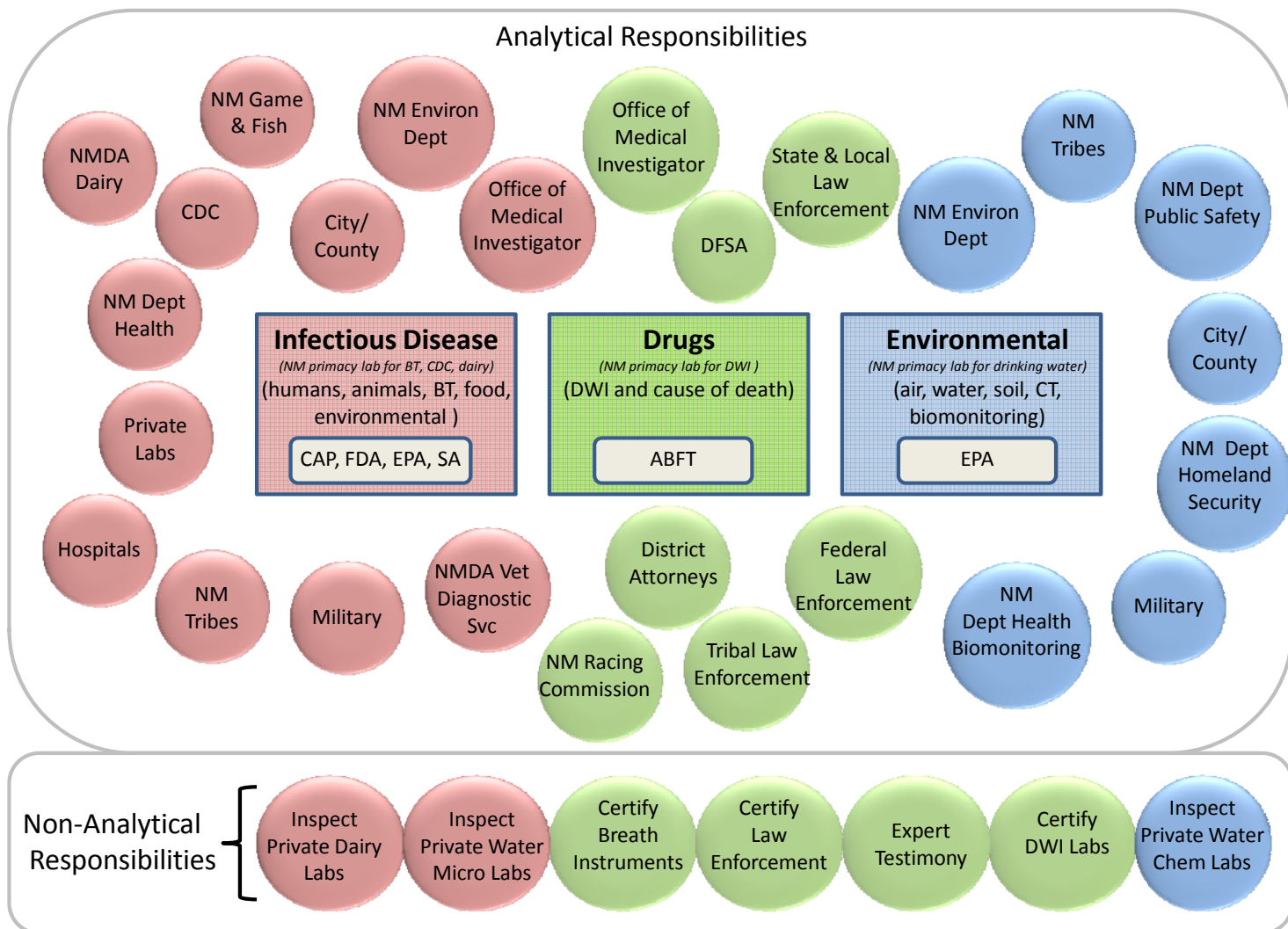


Figure 1: SLD Clients

The SLD Implements Electronic Reporting of Results

Twila Kunde, Deputy Director

The Scientific Laboratory Division's (SLD) Laboratory Information Management System (LIMS) was fully implemented in December 2011. It has been a useful tool to track samples from receipt to report, collect and retrieve pertinent sample information, and allows for more testing automation. While it has had some adjusting pains, it has helped reduce errors in the laboratory and increase efficiencies in testing due to bar code usage and automation.

Another benefit of the LIMS is the ability to report results electronically. Electronic reporting means different things to different users and this is especially displayed through the diversity of the SLD's Bureau activities for their clients.

The Biological Sciences Bureau analyzes specimens from both humans and animals for many diseases: viral, bacterial, and fungal. These results are reported to the submitter, as well as the Department of Health Epidemiology and Response Division (ERD) because, by statute, many of these diseases are reportable to the ERD.



For the SLD, electronic reporting became paramount in response to the national mandate to develop a Health Information Exchange, *i.e.* a standardized system to deliver healthcare information electronically throughout a region. In New

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Mexico, the New Mexico Health Information Collaborative (NMHIC) serves as the hub for New Mexico's Health Information Exchange. As the LIMS was being developed, we worked to develop the appropriate codes for the test results- called LOINC codes.



This was a challenge because public health laboratories run tests for organisms that are not common and, therefore, the LOINC code or codes for the test result(s) for that organism may not yet have been created by the governing body that establishes such codes. The LOINC codes, once available, were then incorporated into electronic messages utilizing the industry standard HL7 reporting format. These encrypted messages contain the patient's name, demographic information, sample information, and test results. The LIMS generates an HL7 message as soon as the result is authorized for release by the laboratory section. These messages are currently sent to NMHIC for dispersal to NM Department of Health and, hopefully in the near future, to the sample submitters. These messages are in a tabulated format which allows for easy and accurate updating of files.

The SLD also sends HL7 messages to the Centers for Disease Control (CDC) for specific reportable diseases. For instance, HL7 messages are automatically generated for



influenza reports and sent to the CDC. Previously, results would be hand-entered into a database when laboratory staff had the time. This would result in a time-lag between completion in the lab and CDC knowing what type of influenza was being seen. Now, with the HL7 reporting being automated, reporting is real-time and less labor intensive.

In another variation of electronic messaging, SLD sends the NM Department of Agriculture Veterinary Diagnostic Services Services (VDS) .PDF files of their reports, basically an electronic 'photocopy' of the report, instead of paper copies. This allows VDS multiple options in reporting to their clients instead of faxing them. VDS receives the .PDF files upon authorization of the report by the SLD laboratory section instead of waiting for the hardcopy reports to be delivered. The VDS personnel have reported that this has made their work more efficient. Although VDS needs to print a copy of the report for their files, they are exploring the possibility of attaching the electronic report to their electronic files, allowing for faster, centralized access to results.

The Chemistry Bureau has another variation of electronic messaging. The federal Safe Drinking Water Act requires that the laboratories performing regulatory testing of drinking water electronically report sample

results as well as a printed copy. The LIMS generates .CSV files that the section supervisors can upload to the New Mexico Environment Department (NMED) Drinking Water Bureau. While we would love to automatically upload the files from the LIMS, the NMED system requires that a supervisor do the upload. The LIMS also generates a separate .CSV file of surface water sample results for the NMED Surface Water Bureau. This file format is unique from the SDWA .CSV file, but is also uploaded by the SLD laboratory section supervisors.



New Mexico Department of Agriculture

As we all know, information technology systems are continually evolving, and the LIMS, along with electronic messaging capabilities is no different. The SLD has applied for funding to develop electronic messaging with the Laboratory Response Network. The objective of the LRN is to improve the public health laboratory infrastructure to ensure an effective laboratory response to biological and chemical terrorism and other emergencies. The electronic messaging would be similar to the current HL7 messaging for CDC, ensuring rapid reporting and tracking. Other projects on the horizon are .CSV reports for VDS and the Dairy Program, as well as sending .PDF report files to the NMED Drinking Water Bureau. The SLD will continue to develop new ways to implement electronic reporting, as time, funding, personnel, and the imagination allow.



Environmental Quality and Laboratory Certification

Phillip Adams, Ph.D.,
Chemistry Bureau Chief

I'd like to begin this article with some thoughts about environmental quality - what it is, and why we need to be mindful of it. From the earliest cyanobacteria some 3.5 billion years ago, all life-forms on this earth have been affected by the quality of their surroundings; from plants adsorbing sunlight, nutrients and water; to animals and birds seeking sustenance and shelter; to our distant ancestors who had to learn to survive or perish under harsh environmental circumstances. Modern humans are capable of endlessly modifying their immediate environment to suit their needs, and of living in all of the earth's climates. We take the natural world for granted, until the most recent hurricane or wildfire reminds us of its presence. Most people in the USA have their basic needs met, but go back a hundred years or so, and that wasn't the case for many - environmental quality issues were often life-changing back then.

The earliest documented thoughts about the nature of quality go back to philosophers such as Aristotle - hot/cold, fast/slow, wet/dry, etc. - but also aesthetic considerations such as good/bad or attractive/repellant. In other words, quality has both a measurable, or classical aspect, and an emotional, or romantic, aspect. Over the following centuries, such thoughts were refined further, leading to substantial advances in the arts and sciences. One of the first people to reconcile the classical and romantic notions of quality was Robert Persig, author of the popular book, Zen and the Art of Motorcycle Maintenance, first published in April 1974. What triggered his musings was the sometimes erratic behavior of his bike engine due to the altitude or the out-

side temperature - environmental quality issues approached from a classical perspective. Much of the book is concerned with how quality underpins all aspects of our existence, and is essential reading for anyone wanting a deeper, metaphysical understanding of quality issues.



Ogri ©Paul Sample

Quality assurance played a steadily increasing role in early 20th century manufacturing processes, with the growing complexity of mass-produced commodities. This gave rise to the first quality systems and quality assurance plans. In a parallel development, environmental laws came into being in the early 20th century with the first drinking water regulations - leading to the more comprehensive Public Health Service Standards by the early 1960s. There was also a growing awareness of how the human drive to control one aspect of the environment can have adverse effects elsewhere, perhaps exemplified in Rachel Carson's book, Silent Spring, published in September 1962. Here, the author's friend noted multitudes of birds dying, and she attributed the cause to the aerial spraying of DDT pesticide. The title was inspired by a John Keats poem, imagining the spring season without birdsong. The book made a substantial impact upon everyday Americans; more so than the dry

legalese in the growing body of environmental rules and regulations. Due to the incidents mentioned in the book and environmental issues such as oil spills, the US Environmental Protection Agency (EPA) was created in December 1970, and the Safe Drinking Water Act (SDWA) was signed into law in December 1974.

So, in the latter half of the 20th century, there was a growing public awareness of environmental issues; how human activity can alter the environment; and how government agencies and laws can regulate activities affecting the environment and public health. People want to live in a clean, safe environment, and have drinkable water flowing from their kitchen tap.

Following the widespread use of the microchip in the 1970s, new scientific instrumentation and methodologies were available to accurately measure the concentrations of various pollutants in air, soil and water, at ever lower concentrations, that can affect our health; enter the Environmental Testing Laboratory and the Laboratory Certification Officer.

New Mexico has over 1,000 public water supply systems in operation, and every one of these must provide routine samples to an accredited or certified drinking water testing laboratory for a variety of chemical, microbiological and naturally occurring radiological contaminants - as required by the EPA under the SDWA. The New Mexico Environment Department's (NMED) Drinking Water Bureau (DWB) is the state entity responsible for oversight of the regulatory program and, as such, has the responsibility to assure that all testing is performed by qualified accredited or certified laboratories. In addition,

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in order for the NMED to maintain its primary enforcement responsibility (primacy) for the state, New Mexico is required to have a Principal State Laboratory for the testing of drinking water. The Scientific Laboratory Division (SLD) is New Mexico's Principal State Laboratory and it is inspected certified directly by the EPA to analyze drinking water samples for almost all the regulated chemical, radiological, and microbiological contaminants. Because the SLD is not large enough to handle all the compliance drinking water samples within New Mexico (we run several thousand a year), some of these samples are analyzed by private laboratories under contract to the DWB; both in-state and out-of-state. It is the responsibility of the DWB to audit and certify all of these to ensure the quality of their work. To do this, the DWB utilizes the SLD to provide certified Laboratory Certification Officers (LCOs), who perform audits of laboratories that are seeking contracts with the DWB to perform regulatory testing, as well as those already under contract with the DWB. The SLD has on staff several LCOs- analytical chemists and microbiologists- who have successfully completed the EPA's LCO training course and passed the federal certification exam. The SLD currently has two LCOs for regulated organic contaminants (PCBs, pesticides, disinfection by-products); two for inorganic contaminants (toxic metals, nitrates, cyanide, fluoride) and two for microbiology (coliform bacteria). Because the SLD is the only laboratory in New Mexico analyzing for radiological contaminants in drink-

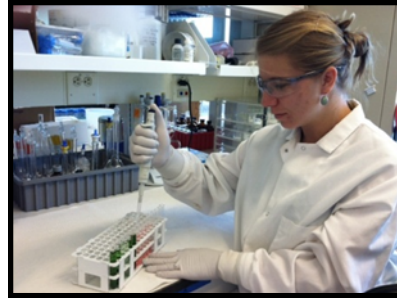


ing water, no LCO is needed to inspect private laboratories for radiological testing. To be certified by DWB, testing labs have to demonstrate to the LCO that they are capable of doing the SDWA compliance testing by passing routine proficiency tests and undergoing periodic third-party audits. The SLD LCOs may be asked to review a lab's proficiency test methods, its quality assurance plan, its standard operating procedures, or even perform a full audit.

Likewise, the LCOs can be asked by the EPA to audit another Principal State Laboratory in EPA Region 6 (which includes Texas, Arkansas, Oklahoma, Louisiana, and New Mexico) - this happens about once a year. When this happens, the auditors typically spend a week at the other State laboratory and write a report that is submitted to the EPA. The SLD radiochemistry supervisor recently received a request by the EPA to help with a neighboring State's radiochemistry lab. The LCOs are the laboratory experts in specific areas of environmental testing for drinking water, and their expertise is often called upon throughout the year.

LCOs need to know the analytical methods inside out, how to apply quality control principles to ensure the analytical results are valid, and how to trouble-shoot analytical instruments when their performances are deteriorating. In addition to the technical aspects of the job, LCOs are trained in ethics, and how to spot laboratory fraud such as chromatographic peak

shaving, falsification of results (known as 'dry-labbing'), and other types of unethical behavior. The repercussions of lab fraud are enormous - a Massachusetts crime lab was closed in 2012 due to falsified lab work, and similar incidents have occurred in the past in private environmental testing laboratories in neighboring states.



Laboratories also have to be able to deliver results in a timely manner, in a format acceptable to the end user. Increasingly, this means an electronic format, in addition to the paper copy. LCOs now have to be experts in

navigating the various electronic databases at the State and Federal level, and in using the Laboratory Information Management System (LIMS) to generate data in the required formats. Data quality (there's that phrase again) is all-important.

So, to summarize, I hope I've illustrated how quality is omnipresent in our natural environment as an underlying dynamic; how it is inherent in federal rules and regulations and in the way we approach our work at the laboratory; how it is demonstrated continuously by the LCOs and analysts by running the tests on time, by keeping the instruments functioning, and by getting the results out in all the different formats. We apply quality decisions to all we do - they are essential.

This article is dedicated to Paul Gray, the lead LCO at the SLD, who retired recently after 34 years of service to New Mexico.

Pictured above are laboratorians Katie Swenson (top) and Nicole Espinoza (bottom) in the Chemistry and Biology bureaus analyzing water samples.

Toxicology Bureau Will Change Alcohol and Drug Reporting Forms on July 1, 2013

Gerasimos Razatos, Supervisor,
Drug Screening, Toxicology

Under New Mexico Statute, the Scientific Laboratory Division (SLD) has a mandate to “promulgate and approve satisfactory techniques or methods” for testing individuals for alcohol and drugs pursuant to the Implied Consent Laws in New Mexico and also to test for alcohol and other drugs in blood of drivers arrested for driving while impaired.

The laboratory receives and tests samples of blood for alcohol and drugs from across the entire state in support of DWI/DUID programs. The results from these tests are used in the adjudication of DWI/DUID criminal cases in all 33 counties in New Mexico. For many years, the SLD has reported out the results of its blood alcohol testing on form SLD 705 by writing in, by hand, the blood alcohol test result. Form SLD 705 also contains chain-of-custody information and information on the arresting officer and the blood collection process. This form was originally approved by the New Mexico Supreme Court as a self-authenticating form, meaning that no laboratory analyst had to appear in court to testify as to the information contained on the form.

When the SLD Toxicology laboratory expanded its Implied Consent testing to include impairing drugs other than alcohol, SLD created the form SLD 705 Supplemental on which it reports out the result of drug tests.

Two recent changes, one having to do with legal rulings and the other with the SLD laboratory operations, rendered the SLD 705 and SLD 705 Supplemental forms obsolete.

First, two rulings by the US Supreme Court of the United States in 2009 (*Melendez-Diaz v Massachusetts*) and 2010 (*Bullcoming v New Mexico*) clarified that form SLD 705 is no longer self-authenticating in court. Second, the implementation of a new laboratory information management system (LIMS) enabled the SLD to generate automated, standardized alcohol and drug result reports, leaving hand-written results unnecessarily time consuming and more subject to error than the electronic report generating system. In light of the above, the SLD has initiated the following revision of its analysis report and chain of custody form to reflect the current legal landscape and available database technologies:

The SLD 705 form (Figure 2a), containing chain of custody information and alcohol results is being replaced by the new SLD Chain of Custody for Implied Consent Evidence form (Figure 2b).

The SLD 705 Supplemental form that contains results of drug analyses is being replaced by the new SLD Report of Drug Analysis (Figure 3), which will contain analytical results of both alcohol and drug testing.

The two new forms will be introduced on July 1, 2013. From that date forward, the new chain of custody form will be included with

each SLD approved evidential blood collection kit, which must be completed by the law enforcement agency prior to submitting the sample to the SLD. The new chain of custody form will still document the law enforcement agency’s information, the blood donor’s information, the blood drawer’s information, and the laboratory receipt information. The difference will be that SLD will no longer report blood alcohol results on this form as it did on the SLD 705 form. The new SLD Report of Drug Analysis will not only have the drug results on it, but will now also include the alcohol results, thus streamlining the report process by listing all test results on one form. A copy of the Report of Drug Analysis and the Chain of Custody for Implied Consent Evidence will still be mailed to the donor of the blood sample and the law enforcement agency. An illustration of the difference in the reporting of blood alcohol results on the new form may be seen in Figure 3 . The SLD will continue to accept the current form 705 until supplies in the field (inside the blood collection kits) are exhausted. All law enforcement officers have to do is use whatever forms they find in the blood kits.

In an endeavor to provide the highest quality of service to all parties included in the DWI/DUID process, we believe that these changes will make it easier to receive and review alcohol and drug results. In addition, we expect these changes to make it easier for prosecuting and defense attorneys to lay foundation for chain of custody and for the SLD scientists to testify with regards to the results in court.

REPORT OF BLOOD ALCOHOL ANALYSIS

SCIENTIFIC LABORATORY DIVISION
1101 Camino de Salud, NE, Albuquerque, NM 87102

Please type or print full information to avoid delay in report.

Form with sections: SEND LAB ANALYSIS REPORT TO, PART A - INFORMATION IN THIS BLOCK TO BE FILLED IN BY ARRESTING OFFICER, ARRESTING OFFICER IDENTIFICATION, REASON SUSPECT STOPPED, INFORMATION BELOW IS TO BE FILLED IN BY DRAWER OF ANY BLOOD SAMPLE.

I certify that on the date, time and place indicated above, I drew blood samples from the above named donor and that I marked and sealed the samples with the donor's name. The blood was collected using the entire contents of an SLD-approved blood collection kit in accordance with the instructions.

Date Title Date Title Date Title Date Title Date Title Date Title

PART B - LABORATORY USE ONLY

Form with sections: CERTIFICATE OF RECEIVING EMPLOYEE, CERTIFICATE OF ANALYST, CERTIFICATE OF REVIEWER, CERTIFICATE OF MAILING.

Chain of Custody for Implied Consent Evidence

SCIENTIFIC LABORATORY DIVISION

1101 Camino de Salud, NE, Albuquerque, NM 87102
Please type or print full information to avoid delay in report.

Form with sections: INFORMATION IN THIS BLOCK TO BE FILLED IN BY ARRESTING OFFICER, ARRESTING OFFICER IDENTIFICATION, REASON SUSPECT STOPPED, INFORMATION BELOW IS TO BE FILLED IN BY DRAWER OF ANY BLOOD SAMPLE.

On the date, time and place indicated above, I drew blood samples from the above named donor and marked and sealed the samples with the donor's name. The blood was collected using the entire contents of an SLD-approved blood collection kit in accordance with the instructions.

Form with sections: LABORATORY RECEIPT, Specimen: Blood, Received from: Via Mail, In Person, Other.

Figure 2a: Old form SLD 705

Figure 2b: New form Chain of Custody for Implied Consent Evidence

Scientific Laboratory Division
1101 Camino de Salud, N.E.
Albuquerque, NM 87102
(505) 383-9000

NPI: 1548488414
Accredited by American Board of
Forensic Toxicology
Report of Drug Analysis



!!! TEST !!!

SLD Case #: IC-DWI-1304-038

Submitter: Santa Fe NMSP
4491 Cerrillos Rd
P.O. Box 1628
Santa Fe, NM 87552

Donor: [REDACTED]
[REDACTED]
Las Cruces, NM 88001

Arresting Officer: [REDACTED]

Date of Birth: [REDACTED]
Social Security #: [REDACTED] Gender: Male
Date of Arrest: [REDACTED]

Sample #: 2013111111
Source: Blood, whole Date Received: 4/8/2013 14:38

The toxicological results for the above sample are listed below:

	Method
Ethanol	GLC
0.03 g/100 mL	

Testing Note(s): The sample was tested for the following drugs-of-abuse using immunoassay: barbiturates, benzodiazepines, cannabinoids, carisoprodol, cocaine metabolite, fentanyl, fluoxetine, hydrocodone, methadone, methamphetamine, opiates, oxycodone, propoxyphene, sertraline, tramadol, tricyclic antidepressants and zolpidem. No drugs were detected.

Reviewer Signature: _____ Date of Review: 4/2/2013

Print Name: _____

On this date I mailed a legible copy of this report to the donor and the submitter at the above address.

Laboratory Employee: _____ Date Mailed: _____

Figure 3: Example of new Report of Drug Analysis form

New Mexico Department of Health Scientific Laboratory Division Newsletter
Summer 2013, volume 11, issue 1

IN THIS ISSUE:

- From the Director
- Electronic Results Reporting
- Environmental Quality and Lab Certification
- New Toxicology Alcohol and Drug Forms

SLD is located within the *New Mexico Scientific Laboratories (NMSL) building*

- Our address is: **1101 Camino de Salud, NE, Albuquerque, NM 87102.**
- The main phone number is: **505-383-9000.**



Here are the driving directions to the New Mexico Scientific Laboratories.

- From I-40 east or westbound, take the I-25 Southbound exit OR
- From I-25 southbound, take the Lomas exit (#225, under the Big I).
 - Go south on the Frontage Road to Mountain Road, turn left under I-25.
 - Make a left on northbound Frontage Road to Camino de Salud (first street on right).
- From I-25 northbound, take the Lomas exit (#225).
 - Go north on the frontage road past Mountain Road.
 - Turn right on Camino de Salud (first street after Mountain).

After turning onto Camino de Salud, the NMSL is the first building you see on the left.

Visitors: Enter the first entrance at the west end of the building (immediately after turning from Frontage Road). Visitor parking is in front of the building.

Sample delivery/Kit pick-ups: Continue to the east entrance into the parking lot. Press "1" at the gate, and security will let you in. Drive around the back of the building to the SLD/OMI loading dock. Park in a designated "Sample Delivery" spot.

- **This is a secure facility, so you will need to ring the buzzer for admittance .**
- **Please bring a picture ID for admission to building.**

Please see our website for updates and a map to the facility.
<http://www.sld.state.nm.us>

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Please direct suggestions, comments, or questions to Twila Kunde, SLD Deputy Director at:
twila.kunde@state.nm.us or by mail at: 1101 Camino de Salud, NE, Albuquerque, NM 87102.