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*State Weights and Measures Laboratories:  
State Standards Program Description  
and Directory*

*Georgia L. Harris*

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**T**he National Institute of Standards and Technology was established in 1988 by Congress to “assist industry in the development of technology . . . needed to improve product quality, to modernize manufacturing processes, to ensure product reliability . . . and to facilitate rapid commercialization . . . of products based on new scientific discoveries.”

NIST, originally founded as the National Bureau of Standards in 1901, works to strengthen U.S. industry's competitiveness; advance science and engineering; and improve public health, safety, and the environment. One of the agency's basic functions is to develop, maintain, and retain custody of the national standards of measurement, and provide the means and methods for comparing standards used in science, engineering, manufacturing, commerce, industry, and education with the standards adopted or recognized by the Federal Government.

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- Manufacturing Technology Centers Program
- Standards Services
- Technology Commercialization
- Measurement Services
- Technology Evaluation and Assessment
- Information Services

### **Electronics and Electrical Engineering Laboratory**

- Microelectronics
- Law Enforcement Standards
- Electricity
- Semiconductor Electronics
- Electromagnetic Fields<sup>1</sup>
- Electromagnetic Technology<sup>1</sup>

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- Chemical Engineering<sup>1</sup>
- Chemical Kinetics and Thermodynamics
- Inorganic Analytical Research
- Organic Analytical Research
- Process Measurements
- Surface and Microanalysis Science
- Thermophysics<sup>2</sup>

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- Atomic Physics
- Molecular Physics
- Radiometric Physics
- Quantum Metrology
- Ionizing Radiation
- Time and Frequency<sup>1</sup>
- Quantum Physics<sup>1</sup>

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- Robot Systems
- Factory Automation
- Fabrication Technology

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- Materials Reliability<sup>1</sup>
- Polymers
- Metallurgy
- Reactor Radiation

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- Building Materials
- Building Environment
- Fire Science and Engineering
- Fire Measurement and Research

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- Information Systems Engineering
- Systems and Software Technology
- Computer Security
- Systems and Network Architecture
- Advanced Systems

### **Computing and Applied Mathematics Laboratory**

- Applied and Computational Mathematics<sup>2</sup>
- Statistical Engineering<sup>2</sup>
- Scientific Computing Environments<sup>2</sup>
- Computer Services<sup>2</sup>
- Computer Systems and Communications<sup>2</sup>
- Information Systems

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<sup>1</sup>At Boulder, CO 80303.

<sup>2</sup>Some elements at Boulder, CO 80303.

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# *State Weights and Measures Laboratories: State Standards Program Description and Directory*

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Georgia L. Harris

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National Institute of Standards and Technology  
Gaithersburg, MD 20899-0001

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## Foreword

In support of its mission to promote uniform standards of measurement throughout the country, the National Institute of Standards and Technology (NIST) received funding from Congress in 1965 to provide new standards of mass, length, and volume and the equipment needed to perform calibrations in these measurement areas to State weights and measures laboratories. This program, called the [New] State Standards Program, was established at NIST. To maintain the validity of these standards and to ensure that the standards are used properly, NIST:

- (1) trains State metrologists in the test procedures used in the NIST laboratories; and
- (2) conducts a voluntary accreditation program for State weights and measures laboratories.

Part I of this publication describes the accreditation activities of the State Standards Program. There are three general requirements for accreditation:

- (1) the State must have adequate facilities, equipment, and standards to perform the measurements;
- (2) the State metrologist must receive the necessary training and submit data demonstrating the results of applying test procedures; and
- (3) the laboratory must establish measurement control programs acceptable to NIST in the various measurement areas.

This approach to laboratory accreditation was endorsed by the 1983 National Conference on Weights and Measures. The Office of Weights and Measures at NIST has proposed the addition of accreditation programs for State laboratories in the areas of Grain Moisture and Petroleum Quality Testing since they have been requested by the State Weights and Measures agencies. Some tentative guidelines are outlined in Part I; specific accreditation requirements will be published in NIST Handbook 143, Program Handbook, or other appropriate document.

Part II is the directory of State weights and measures laboratories and lists the services they provide to State and local weights and measures agencies as well as to industry. The directory is intended to assist potential users of the laboratory services in locating and obtaining needed measurement services. The directory provides a summary table of measurement services and programs as well as the following information for each State or accredited laboratory:

- (1) the accreditation period, if accredited by NIST;
- (2) the laboratory staff member(s), address, and phone number;
- (3) services available; and
- (4) fees, if any, for services.

One objective of the Omnibus Trade and Competitiveness Act of 1988 is to make the International System (SI) of Units the primary measurement system in the United States. SI Units are the preferred measurement system in the State laboratories. State laboratories have primary standards in both "customary" and SI units, the laboratory equipment employ SI units, and training for State metrologists uses primarily the SI System of Units. However, the foremost system for commercial equipment for sales to the public is that of "customary" units. Descriptions of measurement services in this directory refer to whichever system is typically predominant for the type of service provided, although capabilities exist for measurement services in both systems of units.



Note regarding ISO 9000:

During 1992, the Office of Weights and Measures began the process of upgrading the State Laboratory Accreditation Program to include the adoption of ISO Guide 25 with cooperation from the National Voluntary Laboratory Accreditation Program (NVLAP). Accreditation requirements are currently being revised. Technical criteria are being developed following ISO Guide 25, and are consistent with international recommendations. Laboratories have begun the process of implementing new requirements. New requirements include a revision of current laboratory Quality Manuals to meet ISO Guide 25 requirements, along with the continuation of a formal annual self-assessment with review by the Office of Weights and Measures. The Office of Weights and Measures believes that laboratories which are accredited under the new criteria will fully meet customer ISO 9000 service requirements.

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# PART I - Program Description

## Introduction

### Weights and Measures Laboratories

In 1965, Congress funded the National Institute of Standards and Technology (NIST, formerly the National Bureau of Standards) to establish the [New] State Standards Program to provide new standards of mass, volume, and length to the States, the District of Columbia, Puerto Rico, and the Virgin Islands to update their weights and measures laboratories and increase their measurement capabilities. The program also provided the laboratory equipment necessary for the States to use the standards in their measurement services.

New standards and equipment were issued to the States from 1967 through 1978. Since then, many States have purchased additional equipment to increase their measurement capability and to expand into other measurement areas, such as liquid-in-glass thermometry, the frequency testing of tuning forks for police radar guns, and the testing of large volume and liquified petroleum gas (LPG) provers.

Prior to receipt of the standards and equipment, each jurisdiction was required to provide a laboratory facility meeting specifications established under the State Standards Program. In addition, the laboratory metrologist was required to complete training at NIST in the use of the standards and the equipment.

Subsequent to the issue of standards and equipment to the States, NIST instituted a program whereby State weights and measures laboratories are accredited by measurement areas. Accreditation of State weights and measures laboratories is a part of the current State

Standards Program. NIST does not certify the measurements made by a State, but recognizes that an accredited State laboratory has an apparent capability to perform reliable measurements and that the metrologist has been trained in the proper procedures to provide these measurements. The accreditation also indicates that the metrologist has fulfilled the requirements and submitted the data requested by NIST for accreditation. Each State laboratory is responsible for verifying its measurement traceability.

If a laboratory has not been accredited, this does not necessarily indicate that the laboratory is inadequate or, that its measurements are not valid. In some cases a laboratory has not submitted the information necessary to permit NIST to evaluate its capability, hence NIST cannot take a position regarding its capability as a nonaccredited laboratory.

### National Type Evaluation Program

Under the National Type Evaluation Program (NTEP), new weighing and measuring devices are tested and evaluated to determine if they comply with the requirements in NIST Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices" [1] (see references p. 11). The Program is administered by NIST in support of the National Conference on Weights and Measures. Tested devices are intended for use in the commercial measurement system, that is, for use in weighing or measuring commodities to be sold to the general public.

Several State laboratories and the Federal Grain Inspection Service (FGIS) have acquired the capability, and have been authorized by NIST, to conduct type evaluations under the NTEP. These laboratories, and the devices that they are authorized to evaluate, are identified in this publication.

### Accredited Measurement Areas

A brief summary of each measurement area in the accreditation program is given under the headings of Tolerance Testing and Calibration. Some States offer services in other measurement areas (see Unevaluated Measurement Areas in Part I, and directory listings in Part II) but, since NIST has not yet developed criteria to serve as the basis for laboratory accreditation in these areas, they are not included in the current accreditation program.

Each laboratory accredited in a given area has been judged to be capable of providing the measurement services indicated. The range of standards that can be tested by a laboratory depends upon the equipment it has purchased in addition to that received through the State Standards Program.

A general classification of the range of standards that can be tested is indicated by the headings in the tables of services available (see Part II). The mass classifications for tolerance testing are given in pounds because inch-pound standards are usually used. Mass classifications for calibrations are given in kilograms because metric standards are used. Comparable standards in other mass units of measure can also be tested.

### Tolerance testing

A **tolerance** may be simply defined as the permitted difference between the nominal value of the standard and its actual value under specific conditions. **Tolerance testing** is the process for determining if the actual value of a standard is within tolerance. If a standard is not within tolerance it may be **adjusted** to bring the value within tolerance. To be accredited to a tolerance class, a standard must comply with the specifications and tolerances for the specified tolerance class.

### Mass

Tolerance testing of mass standards is usually done according to specifications included in:

- NIST Handbook 105-1 [2]
- American Society for Testing and Materials (ASTM) Standard E 617-91, Classes 4, 5, and 6 [3]
- International Organization of Legal Metrology, Classes M<sub>1</sub>, M<sub>2</sub>, M<sub>3</sub>, [6]

Laboratories may also test to NBS Circular 547, Classes P, Q, and T [4], or to NBS Circular 3, Classes A, B, and C [5]; however, these classes have been superseded by ASTM weight classifications.

### Volume

Tolerance testing of volume standards is divided into small-, intermediate-, and large-volume standards depending upon the laboratory standards to be used. A small-volume standard may have a capacity up to 25 gallons. The capacities of intermediate-volume standards range from 25 through 500 gallons. Large-volume standards have capacities in excess of 500 gallons. Though metric units (liters) are occasionally tested, the principal standard of volume tested is defined in units of gallons.

Glassware standards may be tested to NBS Handbook 105-2 [7] specifications and tolerances or to the tolerances stated in Federal regulations. Metal field standards are tested to NBS Handbook 105-3 [8] specifications and tolerances.

### Calibration

**Calibration** is the process of comparing an unknown standard to a known standard and assigning a value, along with an uncertainty, to the unknown standard. The uncertainty expresses the extent to which that assigned value may be in error relative to its reference base, which typically is the national standard.

When calibrated by a State laboratory, the assigned value may or may not be within the specified

tolerance. The correction and uncertainty assigned to the standard should therefore be used in subsequent measurements. In some cases, the assigned uncertainties will exceed the specified tolerances. The uncertainties, which reflect the level of precision the State laboratories can achieve, will differ from one laboratory to another depending on standards, the competence of the metrologist, and equipment available to perform the measurement. Potential customers should contact the State weights and measures laboratory to verify that the assigned uncertainty that each State will typically provide is adequate for their needs.

### **Mass**

Calibrations are usually performed on mass standards designed to meet specifications and tolerances in:

- American Society for Testing and Materials (ASTM) Standard E 617-91, Classes 1, 1.1, 2, and 3
- International Organization of Legal Metrology Classes E<sub>2</sub> and F<sub>1</sub>.

Laboratories may also test to NBS Circular 547, Classes J, M, S, and S-1; however, these classes have been superseded by ASTM weight classifications.

Depending on the laboratory, air buoyancy corrections may or may not be made. Customers should specify the apparent mass reference density desired (usually apparent mass versus 8.0 g/cm<sup>3</sup>) for their calibration and provide the density of their mass standards.

### **Volume**

Small glassware standards are usually calibrated gravimetrically or by volume transfer. The capacity of metal standards is typically 20 liters or 5 gallons. Metal provers larger than 5 gallons may be calibrated if appropriate standards are available.

### **Length**

Steel tapes up to several hundred feet long may be calibrated. The uncertainties are typically a few thousandths of a foot. Rigid rules up to 12 inches

long can be calibrated with uncertainties of several thousandths of an inch. Most requests for length tests have not been in metric units, though the states are capable of making these measurements.

### **Frequency**

The frequency calibration services are usually limited to tuning forks used with police radar guns.

### **Temperature**

Temperature calibration is generally limited to liquid-in-glass thermometers. Some States test only clinical thermometers of this type. The standards for most States are also liquid-in-glass thermometers, though some use platinum resistance thermometer standards. The uncertainties for temperature calibration will vary among laboratories. Many requests for calibrations involve tolerances specified by the customer.

## **Accreditation Requirements**

### **Weights and Measures Laboratory Requirements**

There are three general requirements for accreditation of State weights and measures laboratories:

- (1) The State must have adequate laboratory facilities, equipment, and standards to provide the services that are offered.
- (2) The State metrologist must: (a) successfully complete the NIST Basic Metrology Seminar; (b) maintain competency through active (annual attendance at meetings and participation in round robin experiments) participation in the Regional Measurement Management Programs (RMMPs); and (c) demonstrate the ability to perform the laboratory measurements, which may be done through the RMMPs, NIST Intermediate Metrology Seminar, or special assignments.



- (3) The metrologist must implement and maintain measurement control programs in various measurement areas as required by NIST.

The requirements for the laboratory facilities and general operation are contained in NBS Handbook 143, "State Weights and Measures Laboratories - Program Handbook" [9]. Each laboratory is evaluated using a self-appraisal checklist (contained in Handbook 143), submitted by the metrologist, subject to verification by an on-site evaluation.

The metrologist is evaluated on the basis of performance in training seminars, the work submitted to NIST as part of the laboratory assignments, participation in technical meetings, and through review of laboratory data and test procedures during the on-site evaluation. The quality of the laboratory's measurement results are evaluated through its control charts and round robin experiments. Brief discussions of these topics follow.

### Training and Evaluation

A suitable technical degree, such as Engineering, Physics, Mathematics, or Chemistry is highly recommended. Working knowledge of algebra and basic statistics is essential. It is expected that metrologists will have spent time in the laboratory familiarizing themselves with the equipment prior to attendance at a Basic Laboratory Seminar.

### *Basic Laboratory Training*

NIST trains State metrologists in the basic laboratory metrology procedures for mass, volume, and length measurement during a 2-week Basic Laboratory Metrology seminar. The test procedures are described in NIST publications, including NBS Handbook 145, "Handbook for the Quality Assurance of Metrological Measurements" [10]. The metrologists must then complete a series of laboratory assignments and submit the data to NIST to document their understanding of the procedures and the calculations. Additional laboratory problems are assigned to each laboratory to establish measurement control programs in several measurement areas.

### *Intermediate and Advanced Laboratory Training*

Each metrologist is expected to attend the Intermediate Metrology Seminar within 2 years of attendance at the Basic Seminar to receive additional training in the laboratory procedures and in the corrections needed for high precision measurement. Following this seminar, the metrologists are assigned a series of problems to demonstrate their understanding of the seminar material.

States that expand into other areas of measurement are encouraged to attend specialized seminars conducted by NIST calibration laboratories. Examples of these areas are temperature and pressure measurements. The laboratories must then establish measurement control programs in these measurement areas to assure agreement with NIST results.

### *Regional and National Programs*

At least one metrologist from each state must participate in Regional Measurement Management Programs (RMMPs). These RMMPs are groups of laboratories in given geographical areas that have joined together to: (1) conduct meetings for the purpose of training and demonstration of procedures; and (2) conduct round robin experiments to promote uniform measurements in their geographical area. The round robin experiments provide an essential link in the measurement traceability between NIST and the States. The knowledge exhibited by metrologists in these meetings and their results on the round robin experiments are included as part of the evaluation of the State laboratories.

In addition to training seminars and regional metrology groups, the Metrology Workshop at the annual meeting of the National Conference on Weights and Measures (NCWM) coordinates the efforts of the regional groups and provides the opportunity for metrologists to become active in weights and measures metrology issues of a national and international nature. The knowledge and participation demonstrated by the metrologists at the annual workshops as well as participation throughout the year in NCWM/NIST work projects afford metrologists the opportunity to provide technical input to the NCWM. This activity not

only enhances the NCWM program and the metrologist's skills and abilities, but allows further evaluation of metrologists' special capabilities.

## **Measurement Control**

NIST criteria require State weights and measures laboratories to utilize formal quality control techniques to ensure that their measurements are sufficiently accurate to meet their needs on a continuing basis. If such techniques are properly employed, it is possible to quantify the uncertainties of the measurements. Monitoring them over time can ensure that they remain sufficiently small to meet operational requirements. NIST has been working closely with the State weights and measures laboratories to help them enhance their laboratory programs and to demonstrate their ability to perform high-quality calibrations.

Measurement control programs have been established for mass calibration, the volume transfer testing of glass volume standards, and a number of other measurement areas, such as tolerance testing and 5-gallon gravimetric control charts. Round robin experiments are conducted to investigate the agreement of the State laboratories in all accredited measurement areas.

The measurement control programs consist of two parts: (1) internal control programs; and (2) external control programs.

### *Internal Control Programs*

The internal measurement control programs generally consist of repeated measurements on the same objects over an extended period of time. The data are plotted on control charts to establish the limits of random errors in the measurement processes. Repeated measurements made on the standards themselves monitor the standards as well as the variability of the measurement process. Statistical confidence tests monitor the stability of the standards and the variance of the measurement process. The control chart data can be used to document the validity of the measurements made on a given day. Finally, the control chart data are used to determine if the standards agree with NIST-reported values. Disagreement with NIST-reported values requires corrective action. If a problem persists, the standards must be recalibrated at NIST.

In some measurement areas it is not possible to keep a standard or standards in the laboratory simply for the purpose of measurement control. For example, it is impractical to keep an extra 100-gallon prover in the laboratory to run as a check standard during every 100-gallon prover test. In such cases, repeated measurements are run on each standard submitted for test. Differences in test results are plotted on a "range" chart. The process variance is estimated from the range in the measurements made on many standards. The range chart is also used to verify that repeated measurements made on a given standard fall within the indicated limits.

In some instances, such as the volume transfer testing of glass flasks, a combination of control and range charts is used. The type of measurement control program depends on the criticality of the measurements, the availability of standards to use as "check" standard, and the tolerances for the standards under test. The frequency of measurements made to control the measurement process and the type of control program utilized are tailored to the measurement area under investigation.

### *External Control Programs*

The NIST goal is to provide an external measurement control system that is available to all States. The overall goal is for each State to actively participate in one of the five formal Regional Measurement Management Programs (RMMPs). The RMMPs promote uniform measurement results by:

- (1) providing training through the presentation of papers prepared by members;
- (2) demonstrating test procedures to assure uniformity;
- (3) conducting round robin experiments to investigate the presence of measurement errors; and
- (4) addressing mutual measurement concerns.

The RMMPs are groups of State and, to a limited extent, private laboratories that have joined together to conduct meetings and perform round robin tests in mass, length, volume, and to a limited extent other measurement areas such as grain moisture, thermometry, and tuning fork testing, to promote

uniformity in test procedures and measurement results. The five RMMPs listed below provide the opportunity for all States, the District of Columbia, Puerto Rico, and the Virgin Islands to participate. A map of the regional groups is shown in figure 1.

- (1) Northeastern Measurement Assurance Program (NEMAP)
- (2) Southeastern Measurement Assurance Program (SEMAP)
- (3) Western Regional Assurance Program (WRAP)
- (4) Mid-America Measurement Assurance Program (MidMAP)
- (5) Southwestern Assurance Program (SWAP)

In the external measurement control programs, standards external to the laboratory are submitted to the laboratory for test. These external standards are normally calibrated by NIST (or FGIS in the case of grain moisture) to provide a reference value. These standards are usually circulated as part of round robin experiments conducted and coordinated by the RMMPs. Although NIST provides values for the circulating standards, the round robin experiments are developed, coordinated, and analyzed by the RMMPs. NIST participates in the data analysis and the regional meetings to identify any problems and to provide training to eliminate discrepancies. This information is vital to the NIST accreditation program. The RMMPs are thus an integral part of the NIST accreditation program and reduce the amount of NIST effort necessary to monitor State laboratories.

The external measurement control programs are used to compare the RMMP results to NIST or other national standard values. These programs investigate the presence of systematic errors and can be used to test the variance of the measurement processes. Plots of interlaboratory data results are frequently used to analyze data. To obtain maximum benefits from these external measurement control programs, internal measurement control programs should be established before a laboratory participates in round robin experiments.

Uniformity among RMMPs is attained through additional NIST training at the meetings, the calibration of standards by NIST used in round robin experiments, and the evaluation of the round robin results. The RMMPs interact further through

the Metrology Workshop held in conjunction with the Annual Meeting of the National Conference on Weights and Measures. Members of each RMMP report activities and round robin results and discuss ways of improving the quality of the laboratories as well as individual proficiency.

A sixth regional measurement group was developed in the Caribbean area during 1992. Participants in the Caribbean Measurement Assurance Program (CaMAP) group include a number of countries in the Caribbean region. Since these laboratories participate in the regional group on a voluntary basis, they have not formed a formal relationship and are outside the scope of the responsibility for the Office of Weights and Measures, hence have not been evaluated according to accreditation criteria.

Participation in the regional measurement group meetings or in the round robin measurements has included Canada, Jamaica, Grenada, Trinidad and Tobago, St. Lucia, Mexico, Ecuador, and the Dominican Republic.

### **National Type Evaluation Program**

NIST will authorize qualified State and other laboratories to: (1) conduct complete testing and evaluation; or (2) conduct field performance testing of specified types of devices under the NTEP. Type evaluations are primarily conducted on scales, weighing systems, meters, metering systems, and devices associated with these applications. The specific types of devices that a Participating Laboratory is authorized to evaluate are identified in the directory.

### **National Type Evaluation Program Requirements**

The objectives of the authorization plan of the National Type Evaluation Program are to:

- (1) promulgate uniform criteria and procedures for testing laboratories;
- (2) authorize those qualifying as "Participating Laboratories" in the Program;
- (3) ensure the uniform application of NTEP device evaluation criteria; and
- (4) provide the basis for acceptance by the States and Federal agencies of the



evaluations conducted in the authorized Participating Laboratories.

To be authorized, laboratories must demonstrate that they have the staff, equipment, and resources to conduct the evaluations. The ability to conduct type evaluations is heavily dependent on the people who do the evaluations. They must have knowledge of Handbook 44 requirements, device applications, and test procedures. They must also have the analytical skills and judgment to determine whether the requirements are satisfied.

Because the nature of type evaluations is very different from laboratory metrology, staff other than the laboratory metrologist are often authorized to conduct type evaluations for NTEP.

Type evaluations may include both laboratory and field tests. A State must have the specialized equipment required to test a device over a temperature range (i.e., an environmental chamber along with other specialized equipment). Field evaluations require much of the same equipment used in weights and measures enforcement testing, but the test procedures are much more extensive. NIST provides extensive training on the NTEP criteria, test procedures, and the rationale behind the requirements. The laboratory staff must demonstrate a thorough knowledge of the criteria and test procedures, the ability to properly analyze the test data and device performance as it pertains to the device applications, and demonstrate the ability to make judgments consistent with NTEP policy. Regular communication with NIST regarding new device features and evaluation criteria is required to maintain uniformity among the NTEP laboratories.

### **Unevaluated Measurement Areas**

In addition to the accredited measurement areas of tolerance testing, calibration, and device type evaluations, many laboratories perform measurements for which the NIST Office of Weights and Measures has not established guidelines for accreditation. These measurement areas can include the testing of dial gauges used to test polyethylene sheeting (an extension of dimensional measurements) or entire programs such as grain moisture testing and petroleum quality

testing. This publication contains new information regarding proposed program and accreditation requirements for grain moisture and petroleum quality programs. The directory in Part II also includes information regarding the services available in these areas.

### **Proposed Grain Moisture Laboratory Program and Accreditation Requirements**

The objectives of developing a Grain Moisture Laboratory Accreditation Program are to promote uniformity in grain moisture testing and provide an accreditation program for State (government) Grain Moisture laboratories.

General requirements for accreditation of Grain Moisture Laboratories will be developed by consensus among participants from State government, the Federal Grain Inspection Service (FGIS) of the U.S. Department of Agriculture, the National Conference on Weights and Measures (NCWM), and the NIST Office of Weights and Measures. The Program will follow the same accreditation/authorization steps as the accreditation of State weights and measures laboratories and the authorization of Participating Laboratories for type evaluation of devices that is described in NBS Handbook 143.

There will be three general requirements for accreditation of State grain moisture laboratories:

- (1) The laboratory must be organized and staffed in such a way as to ensure efficient execution of its responsibilities.
- (2) The laboratory must have an acceptable facility, appropriate equipment and standards, and trained laboratory staff. The laboratory facilities, equipment and standards, and staff will be described in Handbook 143, Laboratory Program Handbook, and evaluated in a self-appraisal checklist (similar to the Appendix C in that handbook, for weights and measures laboratories). As with the other programs, accreditation is subject to a NIST, FGIS, or other external evaluation.

- (3) In addition to the recommended minimum guidelines for facilities, equipment and standards, and staff, the laboratory must have in place, and follow, an appropriate Measurement Control or Quality Control Program.

The laboratory must have a formal, written system description, measurement control, or quality control document that addresses the following accreditation requirements:

- (1) Tests must be performed according to nationally recognized (FGIS) specifications.
- (2) Documented and recognized test procedures (FGIS), and appropriate test equipment must be used.

Laboratory staff will typically have specialized professional training, and experience in Grain Moisture Testing that is very different from laboratory metrology. No formal training program is in place at NIST at this time and qualifications have not been established. However, staff will be subject to competency testing.

As part of the competency testing, the laboratory must participate in official round robin measurements (FGIS, NIST) to verify acceptable and consistent test results.

### **Proposed Petroleum Quality Laboratory Program and Accreditation Requirements**

The objectives of developing a petroleum quality accreditation program are to promote uniformity in petroleum quality testing and provide a accreditation program for State (government) Petroleum Quality laboratories.

General requirements for Petroleum Quality Laboratories will be developed by consensus between participants from State government agencies, the petroleum industry, the National Conference on Weights and Measures (NCWM), the American Society for Testing and Materials (ASTM), and the NIST Office of Weights and Measures recommendations. It will follow the same accreditation/authorization steps as the accreditation of State weights and measures

laboratories and the authorization of Participating Laboratories for type evaluation of devices, as those described in NBS Handbook 143.

There will be three general requirements for accreditation of State petroleum quality laboratories:

- (1) The laboratory must be organized and staffed in such a way as to ensure efficient execution of its responsibilities.
- (2) The laboratory must have an acceptable facility, appropriate equipment and standards and trained laboratory staff. The laboratory facilities, equipment and standards, and staff will be described in Handbook 143, Laboratory Program Handbook, and evaluated in a self-appraisal checklist (similar to that in Appendix C for weights and measures laboratories). As with the other programs, accreditation is subject to a NIST or other external evaluation.
- (3) In addition to the recommended minimum guidelines for facilities, equipment and standards, and staff, the laboratory must have in place, and follow, an appropriate Measurement Control or Quality Control Program.

A formal and written system description, measurement control, or quality control document must be in place that addresses the following accreditation requirements:

- (1) Tests must be performed according to nationally recognized (ASTM, API, EPA) specifications.
- (2) Documented and recognized test procedures (usually ASTM petroleum test methods), and appropriate test equipment must be used.

Laboratory staff will typically have professional training, education, and experience in Petroleum Quality Testing, that is very different from laboratory metrology. No formal training programs are in place at NIST at this time and qualifications

have not been established. However, under this program, staff will be subject to competency testing.

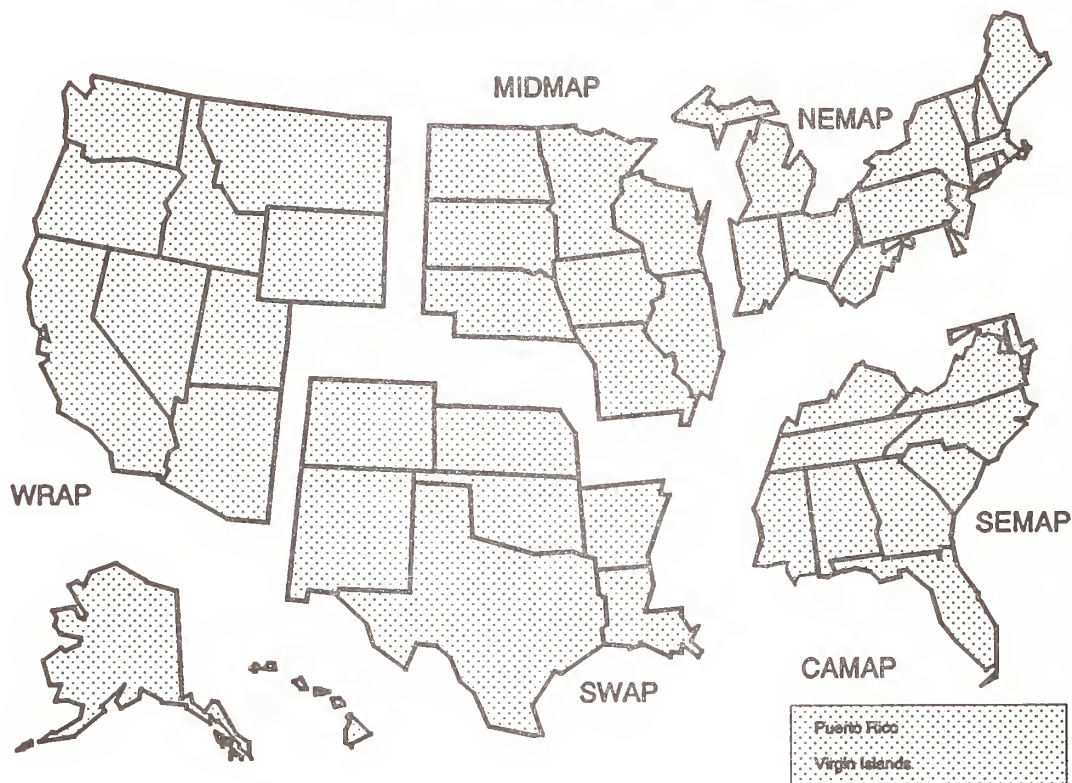
As part of the competency testing, the laboratory must participate in official round robin measurements (ASTM or regional) to verify acceptable and consistent test results.

### **Summary**

In order to be accredited in a particular measurement area, each State must have a trained metrologist and an adequate facility, and must demonstrate on a continuing basis that it is capable of providing valid measurements. Accreditation by NIST indicates that the laboratory is capable of providing a measurement service, but each State must verify its own measurement traceability.

The directory of laboratories in Part II summarizes the accredited areas of measurement that each State is qualified to perform and provides detailed information to assist industry and government agencies in locating laboratories that provide needed measurement services. The directory also includes listings for some measurement areas for which accreditation is not currently available.

- (1) Northeastern Measurement Assurance Program (NEMAP)
- (2) Southeastern Measurement Assurance Program (SEMAP)
- (3) Western Regional Assurance Program (WRAP)
- (4) Mid-America Measurement Assurance Program (MidMAP)
- (5) Southwestern Assurance Program (SWAP)
- (6) Caribbean Measurement Assurance Program (CaMAP)



**Figure 1.** Regional Measurement Management Programs (RMMPs, see p. 5).



## References

- [1] Oppermann, H. V., editor; Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices; NIST Handbook 44, 1992.
- [2] NIST Handbook 105-1 (Revised 1990), Specifications and Tolerances for Reference Standards and Field Standard Weights and Measures. 1. Specifications and Tolerances for Field Standard Weights (NIST Class F).
- [3] ASTM (American Society for Testing and Materials) E 617-91, Standard Specification for Laboratory Weights and Precision Mass Standards, ASTM, Philadelphia, PA 19103.
- [4] NBS Circular 547, Section 1, Precision Laboratory Standards of Mass and Laboratory Weights, 1954, out of print.
- [5] NBS Circular 3, Design and Test of Standards of Mass, out of print.
- [6] OIML (International Organization of Legal Metrology), International Recommendation Numbers 1, 2, 20, 25, 47, 52.
- [7] NBS Handbook 105-2 (Revised 1971), Specifications and Tolerances for Reference Standards and Field Standard Weights and Measures. 2. Specifications and Tolerances for Field Standard Measuring Flask.
- [8] NBS Handbook 105-3 (Revised 1979), Specifications and Tolerances for Reference Standards and Field Standard Weights and Measures. 3. Specifications and Tolerances for Graduated Neck Type Volumetric Field Standards.
- [9] Oppermann, H. V., Taylor, J. K., State Weights and Measures Laboratories, Program Handbook, NBS/HB 143 (1985).
- [10] Taylor, J. K., Oppermann, H. V., Handbook for the Quality Assurance of Metrological Measurements, NBS/HB 145 (1986).





## **PART II - Laboratory Directory**

### **Summary of Measurement Services and Programs**

A table summarizing the available services is provided.

### **Alphabetical Index**

The following information is given for each State or accredited laboratory (in alphabetical order):

- (1) the accreditation period, if accredited by NIST;
- (2) the laboratory staff member(s), address, and phone number;
- (3) services available; and
- (4) fees, if any, for services.





Summary of Measurement Services and Programs																
	Tolerance Testing				Calibration						NTEP	Grain Moisture Program	Petroleum Program	Registered Service Agents		
	Mass		Volume		Mass		Volume		Length						Freq	Temp
	≤ 1000 lb	> 1000 lb	small ≤ 25 gal	intrm 25 ≤ 500 gal	large > 500 gal	≤ 3 kg	> 3 kg	glass	metal	tapes	rules	tune forks				
Los Angeles City	✓	✓	✓	✓	✓	✓	✓	✓	✓							
Maine	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓
Maryland	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	
Massachusetts	✓		✓	✓		✓	✓	✓	✓	✓	✓			✓		
Michigan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓
Minnesota	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Mississippi	✓		✓													
Missouri	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓
Montana	✓	✓	✓	✓												✓
Nebraska	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓		✓
Nevada	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓
New Hampshire																✓
New Jersey	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
New Mexico	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
New York	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	
North Carolina	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓
North Dakota	✓	✓	✓	✓	✓										✓	✓
Ohio	✓	✓	✓	✓										✓		✓
Oklahoma	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓			✓	✓	✓

	Tolerance Testing				Calibration										NTEP	Grain Moisture Program	Petroleum Program	Registered Service Agents
	Mass		Volume			Mass		Volume		Length		Freq	Temp					
										tapes	rules			tune forks				
	$\leq 1000$ lb	$> 1000$ lb	small $\leq 25$ gal	intm $25 \leq 500$ gal	large $> 500$ gal	$\leq 3$ kg	$> 3$ kg	glass	metal									
Los Angeles Cty	✓	✓	✓	✓	✓	✓	✓	✓										
Maine	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓			✓		✓		
Maryland	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓			
Massachusetts	✓		✓	✓		✓	✓	✓	✓	✓	✓				✓			
Michigan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓		
Minnesota	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓		
Mississippi	✓		✓											✓		✓		
Missouri	✓	✓	✓	✓	✓	✓		✓	✓					✓		✓		
Montana	✓	✓	✓	✓												✓		
Nebraska	✓	✓	✓	✓	✓	✓		✓	✓		✓			✓		✓		
Nevada	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓				✓	✓		
New Hampshire																✓		
New Jersey	✓		✓	✓	✓	✓		✓	✓		✓		✓			✓		
New Mexico	✓	✓	✓	✓	✓	✓		✓	✓		✓		✓		✓	✓		
New York	✓	✓	✓	✓	✓	✓		✓	✓		✓				✓			
North Carolina	✓	✓	✓	✓	✓	✓		✓	✓		✓		✓	✓	✓	✓		
North Dakota	✓	✓	✓	✓	✓										✓	✓		
Ohio	✓	✓	✓	✓										✓		✓		
Oklahoma	✓	✓	✓	✓		✓		✓	✓	✓	✓				✓	✓		





# Alabama

Accreditation Period: 1994

Laboratory Staff	Address	Telephone Number
John W. Campbell, Metrologist  Terry Snow, Metrologist	Division of Gins & Warehouses PO Box 3336 Montgomery, AL 36193	(205) 242-2652  FAX: (205) 240-3135

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	X
	Weight > 1000 lb	F		Weight > 3 kg	X
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	X
	Intermediate 25 - 500 gal	F		Small Glassware	X
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	X
				Rigid Rules	X
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Labor...\$45 per hour. Registered service agents and parent organization are exempt from fees.

# Alabama

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Division of Agricultural Chemistry Department of Agriculture & Industries PO Box 3336 Montgomery, AL 36109-0336	(205) 242-2639
Person responsible for program	Lance Hester
Contact for additional information	Vaughn Johnson
Additional accreditation/recognition	

National Type Evaluation Program (NTEP)	
Address	Telephone Number
Division of Gins & Warehouses PO Box 3336 Montgomery, AL 36109-0336	(205) 242-2639
Person responsible for program	James J. Cowart
Contact for additional information	Larry Turberville, John Campbell
Additional accreditation/recognition	NIST Authorized Laboratory
NTEP performance testing of vehicle, axle-load, livestock, and floor scales.	



# Alaska

Accreditation Period: 1994

Laboratory Staff	Address	Telephone Number
Darrel E. Cavender, Metrologist	<p>Dept of Comm &amp; Economic Dev Measurement Standards 12050 Industry Way, Bldg "O" Anchorage, AK 99515</p> <p>PO Box 111686 Anchorage, AK 99511</p>	<p>(907) 345-7750</p> <p>FAX: (907) 345-2641 or (907) 345-6835</p>

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	N	Mass	Weight $\leq$ 3 kg	N
	Weight > 1000 lb	N		Weight > 3 kg	N
Volume	Small $\leq$ 25 gal	N	Volume	Metal Standards	N
	Intermediate 25 - 500 gal	N		Small Glassware	N
	Large > 500 gal	N			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	N
				Rigid Rules	N
			Frequency	Tuning Forks	N
			Temperature	Liquid in Glass Thermometry	X

Fees
No fees are charged.

# Alaska

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
12050 Industry Way Anchorage, AK 99515	(907) 345-7750
Person responsible for program	Darrel E. Cavender
Contact for additional information	
Additional accreditation/recognition	Watthour meter testing

# Arizona

Accreditation Period: 1994

Laboratory Staff	Address	Telephone Number
Kelleen K. Moody, Metrologist  Matthew A. Crandall, Metrological Tech	Dept of Weights and Measures 9535 E. Doubletree Ranch Rd. Scottsdale, AZ 85258-5539	(602) 255-5211 x2229  FAX: (602) 255-1950

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight > 1000 lb	F		Weight > 3 kg	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Labor ... \$40 per hour. Minimum half-hour charge of \$24.

## Remarks:

The Arizona laboratory moved into a new facility during 1993.

# Arizona

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
9535 E. Doubletree Ranch Road Scottsdale, AZ 85258	(602) 255-5211
Person responsible for program	John Hays
Contact for additional information	Sharon S. Rhoades
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
9535 E. Doubletree Ranch Rd. Scottsdale, AZ 85258	(602) 255-5211
Person responsible for program	John Hays
Contact for additional information	Kelleen K. Moody
Additional accreditation/recognition	

# Arkansas

Accreditation Period: 1993-1995

Laboratory Staff	Address	Telephone Number
Billy W. Sullivant, Laboratory Supervisor Charles Kirspel, Jr., Metrologist Randall W. Burns, Metrologist & Grain	Arkansas Bureau of Standards 4608 West 61st St Little Rock, AR 72209	(501) 324-9680 FAX: (501) 562-7605

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	N	Mass	Weight $\leq$ 3 kg	N
	Weight > 1000 lb	N		Weight > 3 kg	N
Volume	Small $\leq$ 25 gal	N	Volume	Metal Standards	N
	Intermediate 25 - 500 gal	N		Small Glassware	N
	Large > 500 gal	N			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	N
				Rigid Rules	N
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
No fees are charged.



# Arkansas

Grain Moisture Testing	
Address	Telephone Number
Arkansas Bureau of Standards 4608 West 61st Street Little Rock, AR 72209	(501) 324-9680  FAX: (501) 562-7605
Person responsible for program	Billy W. Sullivan
Contact for additional information	Randall W. Burns
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Arkansas Bureau of Standards 4608 West 61st Street Little Rock, AR 72209	(501) 324-9680  FAX: (501) 562-7605
Person responsible for program	David O. Karlsh
Contact for additional information	
Additional accreditation/recognition	ASTM D-2, Chemist, CDL

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	



# California

Accreditation Period: 1993-1995

Laboratory Staff	Address	Telephone Number
Joseph Rothleder, State Metrologist  Thomas S. Fletcher, Msmt Stds Specialist III  Walter Camozzi, Msmt Stds Specialist II	Division of Measurement Standards Dept of Food and Agriculture 8500 Fruitridge Rd Sacramento, CA 95826	(916) 387-4256  FAX: (916) 387-4260

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight $>$ 1000 lb	F		Weight $>$ 3 kg	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large $>$ 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	F

Fees
Labor...\$60 per hour, for Metrology Laboratory only. For testing services beyond Metrology Laboratory, contact persons listed for details, arrangements, and quotes.

# California

National Type Evaluation Program (NTEP)	
Address	Telephone Number
Division of Measurement Standards 8500 Fruitridge Road Sacramento, CA 95826	(916) 387-4256  Fax (916) 387-4260
Person responsible for program	Steve Cook
Contact for additional information	Jim Tollefson
Additional accreditation/recognition	NIST Authorized Laboratory
<p>NTEP testing of:</p> <p><u>Scales and Weighing Devices</u> Counter, portable, hanging, floor, crane, hopper, vehicle, axle-load, and livestock scales; automatic bulk weighing systems; indicating and recording elements, mass flow meters, belt-conveyor scales, small capacity load cells 5 - 110 kg.</p> <p><u>Volume Measuring Devices</u> Retail motor-fuel dispensers; indicating and computing elements; vehicle-tank and wholesale meters; service station consoles; LP-gas liquid meters, compressed natural gas dispensers (retail).</p> <p><u>Linear Measuring Devices</u> Taximeters</p> <p><u>Other</u> Electronic cash registers interfaced with either scales or retail motor-fuel dispensers</p>	

Commercial Measuring Device Testing (non-NTEP)	
Address	Telephone Number
Division of Measurement Standards 8500 Fruitridge Road Sacramento, CA 95826	(916) 387-4241  Fax (916) 387-4260
Person responsible for program	Dennis Johannes
Contact for additional information	Jim Tollefson
Additional accreditation/recognition	
<p><u>Meters</u> petroleum (retail, vehicle, and wholesale), watthour, cordage, wire, taxi, water, vapor, liquid, liquefied gas, cryogenic gas, compressed natural gas</p> <p><u>Scales</u> computing, crane, platform, hopper, tank, livestock, prescription, jeweler, railway track, vehicle</p> <p><u>Other</u> timers, vapor recovery systems, weighing systems</p>	

# California

## Grain Moisture Testing

Address	Telephone Number
Division of Measurement Standards 8500 Fruitridge Road Sacramento, CA 95826	(916) 387-4256  Fax (916) 387-4260
Person responsible for program	Joseph Rothleder
Contact for additional information	Walter Camozzi
Additional accreditation/recognition	Participation in round robin experiments

## Petroleum Quality Testing

Address	Telephone Number
Division of Measurement Standards 8500 Fruitridge Road Sacramento, CA 95826	(916) 387-4248  Fax (916) 387-4260
Person responsible for program	Floyd Worcester
Contact for additional information	Al Hebert
Additional accreditation/recognition	Round robins, Pacific Coast Sample Exchange Program

## Radiation Instrument Calibration

Address	Telephone Number
Office of Emergency Services 2800 Meadowview Road Sacramento, CA 95832	(916) 262-1735
Person responsible for program	John Anderson
Contact for additional information	Detmar Schroeder
Additional accreditation/recognition	Accreditation by the Conference of Radiation Control Program Directors and participates in proficiency tests conducted by NIST.





# Colorado

Accreditation Period: 1993-1995

Laboratory Staff	Address	Telephone Number
William L. Young, Chief Metrologist	Colorado Dept of Agriculture Inspection and Consumer Services Measurement Standards Metrology Laboratory 3125 Wyandot St Denver, CO 80211-3824	(303) 866-2845  FAX: (303) 886-2836

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight > 1000 lb	F		Weight > 3 kg	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	F
			Temperature	Liquid in Glass Thermometry	X

Fees
Labor...\$20 per hour.

## Remarks:

Laboratory has been involved with the development of procedures to evaluate laser radar guns and the development of procedures for testing tuning forks.

# Colorado

Grain Moisture Testing	
Address	Telephone Number
Colorado Department of Agriculture Measurement Standards Section 3125 Wyandot Street Denver, CO 80211-3824	(303) 866-2845
Person responsible for program	William L. Young
Contact for additional information	Richard K. Miller
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Colorado Department of Labor and Employment Oil Inspection Section 1001 East 62nd Ave, Bldg 1 Denver, CO 80216-1140	(303) 289-5643
Person responsible for program	Richard D. Piper
Contact for additional information	Helen Lois Struck
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Colorado Department of Agriculture Measurement Standards Section 3125 Wyandot Street Denver, CO 80211-3824	(303) 866-2845
Person responsible for program	William L. Young
Contact for additional information	
Additional accreditation/recognition	

# Connecticut

Accreditation Period: 1994 - 1996

Laboratory Staff	Address	Telephone Number
Michael J. Dynia, Metrologist	Weights and Measures Division Dept of Consumer Protection State Office Bldg Room G15 Hartford, CT 06106	(203) 566-5230 Office, Rm G-31A  (203) 566-4778 Lab, Rm G-15  FAX: (203) 566-7630

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight > 1000 lb	X		Weight > 3 kg	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	X		Small Glassware	F
	Large > 500 gal	X			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	F

Fees
Labor...\$75 per hour. Minimum charge \$75. Certificate of Traceability: \$30 per weight kit  Tolerance testing rates: 50 lb (25 kg) to 1000 lb (500 kg) \$25 each 2 lb ( 1 kg) to 50 lb ( 20 kg) \$13 each less than 2 lb (1 kg) \$7.00 each 10 to 32 lb weight kits (<26 pieces) \$95 per kit Other weight kits (<16 pieces) \$70 per kit

## Remarks:

Laboratory tests clinical thermometers.

# Connecticut

Grain Moisture Testing	
Address	Telephone Number
Department of Agriculture Rm 287, 165 Capitol Avenue Hartford, CT 06106	(203) 566-5268
Person responsible for program	Al VanDyke
Contact for additional information	
Additional accreditation/recognition	specific testing of corn moisture

Petroleum Quality Testing	
Address	Telephone Number
Department of Consumer Protection Rm G-17, 165 Capitol Avenue Hartford, CT 06106	(203) 566-5230 (203) 566-4778
Person responsible for program	Allan M. Nelson
Contact for additional information	Raymond Kalentkowski
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	



# Delaware

Accreditation Period: 1993-1995

Laboratory Staff	Address	Telephone Number
David L. Baird, Metrologist	DE Dept of Agriculture Weights and Measures Section 2320 S DuPont Hwy Dover, DE 19901-5515	(302) 739-4811 X232 FAX: (302) 697-6287

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	N	Mass	Weight $\leq$ 3 kg	N
	Weight > 1000 lb	N		Weight > 3 kg	N
Volume	Small $\leq$ 25 gal	N	Volume	Metal Standards	N
	Intermediate 25 - 500 gal	N		Small Glassware	N
	Large > 500 gal	N			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	N
				Rigid Rules	N
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
No fees are charged

## Remarks:

Delaware moved into a new laboratory January 1990, and uses an environmental chamber for precision mass measurements.

# Delaware

Grain Moisture Testing	
Address	Telephone Number
Delaware Department of Agriculture 2320 S DuPont Hwy Dover, DE 19901-5515	(302) 739-4811 x232
Person responsible for program	David L. Baird
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Motor Fuel Tax Administration PO Drawer E Dover, DE 19903-1555	(302) 739-4538  FAX: (302) 739-6299
Person responsible for program	Dale A. Shuirman
Contact for additional information	
Additional accreditation/recognition	work being done by the State of Maryland

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# District of Columbia

Not currently Accredited

Laboratory Staff	Address	Telephone Number
vacant, Chief/Metrologist	Weights, Measures, & Markets Branch	(202) 767-7923
Jeffrey X. Mason, Inspector	614 "H" St NW	
	Washington, DC 20001	
Leon Weston, Inspector	1110 "U" St SE	
	Wash, DC 20020	

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	X	Mass	Weight $\leq$ 3 kg	X
	Weight > 1000 lb	X		Weight > 3 kg	X
Volume	Small $\leq$ 25 gal	X	Volume	Metal Standards	X
	Intermediate 25 - 500 gal	X		Small Glassware	X
	Large > 500 gal	X			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	X
				Rigid Rules	X
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Labor...\$15 per hour.

# District of Columbia

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	



# Florida

Accreditation Period: 1992-1994

Laboratory Staff	Address	Telephone Number
Michael D. Cook, Senior Metrologist Barry E. Smith, Senior Metrologist Paul Gentry, Metrologist Charles E. Barnes, Lab Technician II Carlos D'Arcy, Metrologist, Fort Laud.	Department of Agriculture and Consumer Services 3125 Conner Blvd, Bldg 2 Tallahassee, FL 32399-1650	(904) 488-9295  FAX: (904) 922-6655

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight > 1000 lb	F		Weight > 3 kg	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee*; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	F

Fees
1) \$40 per hour. 2) Fees vary according to type of artifact and service requested. 3) Contact the laboratory for specific information.

## Remarks:

Laboratory also tests stopwatches.

# Florida

Grain Moisture Testing	
Address	Telephone Number
Weights and Measures Laboratory Bldg #2 3125 Conner Blvd Tallahassee, FL 32399-1650	(904) 488-9295
Person responsible for program	Barry E. Smith
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Petroleum Inspection Bldg #1 3125 Conner Blvd Tallahassee, FL 32399-1650	(904) 488-9740
Person responsible for program	Eric Hamilton
Contact for additional information	Eric Hamilton
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# Georgia

Accreditation Period: 1993-1995

Laboratory Staff	Address	Telephone Number
Martin T. Coile, State Metrologist Brenda J. Whitener, Asst State Metrologist Valentino Bradford, Metrologist I Carla Pesce, Metrologist I	Weights and Measures Lab 16 Forest Pkwy Forest Park, GA 30050	(404) 363-7685 X88 FAX: (404) 362-4564

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight $>$ 1000 lb	F		Weight $>$ 3 kg	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large $>$ 500 gal	X			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	O

Fees
Calibration and tests are prorated at \$35.00 per hour. Price quotes on request.

## Remarks:

The Georgia laboratory maintains computerized control charts for all weights used in mass calibrations as part of the measurement control program, and has independent laboratory rooms, balances, and standards for calibration and tolerance testing of mass.

# Georgia

Grain Moisture Testing	
Address	Telephone Number
Weights and Measures Laboratory 16 Forest Pkwy Forest Park, GA 30050	(404) 363-7685
Person responsible for program	Martin T. Coile/Brenda J. Whitener
Contact for additional information	Carla J. Pesce
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
State Fuel Oil Laboratory 5235 Kennedy Rd Forest Park, GA 30050	(404) 363-7597
Person responsible for program	Curtis Williams
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	



# Hawaii

Accreditation Period: 1993-1995

Laboratory Staff	Address	Telephone Number
Lester Yazawa, Chief Metrologist  Donna Kadooka, Metrologist	HI Dept of Agriculture Msmt Standards Division 725 Ilalo St Honolulu, HI 96813-5524	(808) 586-0886  FAX: (808) 586-0889

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight > 1000 lb	F		Weight > 3 kg	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Fees are established by rule and vary according to type of artifact and type of service requested. Service repair agencies registered with the state are exempt from fees.

# Hawaii

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Measurement Standards Division 725 Ilalo St Honolulu, HI 96813	(808) 586-0882
Person responsible for program	Lester Yazawa
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# Idaho

Accreditation Period: 1993-1995

Laboratory Staff	Address	Telephone Number
Tom W. Schafer, Metrologist	Dept of Agriculture Bureau of Weights and Measures 2216 Kellogg Lane Boise, ID 83712	(208) 334-2345  FAX: (208) 334-2170

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	N	Mass	Weight $\leq$ 3 kg	N
	Weight > 1000 lb up to 2500 lb	N		Weight > 3 kg	N
Volume	Small $\leq$ 25 gal	N	Volume	Metal Standards	N
	Intermediate 25 - 500 gal	N		Small Glassware	X
	Large > 500 gal	N			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	N
				Rigid Rules	N
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
No fees are charged for customers within the state of Idaho.

# Idaho

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	



# Illinois

Accreditation Period: 1993-1995

Laboratory Staff	Address	Telephone Number
Stephen E. McGuire, Metrologist Mike Rockford, Metrologist Associate	IL Dept of Agriculture Division of Consumer Services Bureau of Weights and Measures Standards Laboratories State Fairgrounds, Box 19281 Springfield, IL 62794-9281	(217) 785-8480 or 8530 FAX: (217) 524-7801 Toll-Free (Illinois) 1-800-582-0468

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight $>$ 1000 lb	F		Weight $>$ 3 kg	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large $>$ 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Labor...\$25 per hour, tolerance testing. \$40 per hour for calibrations in mass, length, and volume.

## Remarks:

The Illinois laboratory has a documented Quality Assurance Program to assure compliance with Mil-Std-45662A audits, and maintains ongoing control charts for all calibrations.

# Illinois

Grain Moisture Testing	
Address	Telephone Number
IL Dept of Agriculture Division of Consumer Services Bureau of Weights and Measures State Fairgrounds, Box 19281 Springfield, IL 62794-9281	(217) 785-8482
Person responsible for program	Ron Berg
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
IL Dept of Agriculture Division of Consumer Services Bureau of Weights and Measures State Fairgrounds, Box 19281 Springfield, IL 62794-9281	(217) 785-8213
Person responsible for program	Rich Philmon
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
IL Dept of Agriculture Division of Consumer Services Bureau of Weights and Measures State Fairgrounds, Box 19281 Springfield, IL 62794-9281	(217) 782-3817
Person responsible for program	Jerry Robertson
Contact for additional information	
Additional accreditation/recognition	Egg Inspection Program

# Indiana

Accreditation Period: 1993-1994

Laboratory Staff	Address	Telephone Number
Peter W. Boykin, Metrologist  Jerry Clingaman, Asst. Metrologist	Indiana State Board of Health Division of Weights and Measures 1330 W Michigan St Indianapolis, IN 46206	(317) 633-0350 (Office)  (317) 633-0789 (Lab)  FAX: (317) 633-0776

## Services Available

Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	N	Mass	Weight $\leq$ 3 kg	N
	Weight $>$ 1000 lb	N		Weight $>$ 3 kg	N
Volume	Small $\leq$ 25 gal	N	Volume	Metal Standards	N
	Intermediate 25 - 500 gal	N		Small Glassware	N
	Large $>$ 500 gal	X			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	N
				Rigid Rules	N
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

## Fees

No fees are charged.

# Indiana

Grain Moisture Testing	
Address	Telephone Number
Commission on Agriculture	(317) 232-1356
Person responsible for program	Mary Douglas (McCory)
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Indiana State Board of Health Division of Weights and Measures 1330 W Michigan St Indianapolis, IN 46206	(317) 633-0350
Person responsible for program	Michael A. Horan
Contact for additional information	
Additional accreditation/recognition	contracting tests

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	



# Iowa

Accreditation Period: 1994-1996

Laboratory Staff	Address	Telephone Number
Robert E. Hollis, Metrologist  Thomas Mathews, Laboratory Asst 3	IA Dept of Agriculture Weights and Measures Division Henry Wallace Bldg Des Moines, IA 50319	(515) 281-5716  (515) 281-5861  FAX: (515) 281-6800

## Services Available

Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	X
	Weight $>$ 1000 lb	F		Weight $>$ 3 kg	X
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large $>$ 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

## Fees

Mass calibration, refined fuel and LPG prover calibration \$10 per hour; one hour minimum charge.

Tolerance testing mass:  $\leq$  5 lb: \$2; 5 lb  $<$  W  $\leq$  50 lb: \$5; 50 lb  $<$  W  $\leq$  100 lb: \$8; 100 lb  $<$  W  $\leq$  500 lb: \$10; 500 lb  $<$  W  $\leq$  1000: \$15 1000 lb  $<$  W  $\leq$  2500 lb: \$25; Weight kits with 10 or more weights: \$30 per kit.

Volume measures: Laboratory glassware: \$10; Metal, 1 gal - 5 gal: \$10; Metal, 5 gal - 10 gal: \$15; Metal, 10 gal - 20 gal: \$20.

Linear measures: Rigid rulers: \$20; Steel and Fabric measuring tapes: \$.10/ft for first 10 feet, \$.50/ft for each 10 ft interval thereafter.

# Iowa

Grain Moisture Testing	
Address	Telephone Number
IA Dept of Agriculture Weights and Measures Division Henry Wallace Bldg Des Moines, IA 50319	(515) 281-5716  (515) 281-5861
Person responsible for program	Jerry L. Bane, Bureau Chief
Contact for additional information	Thomas Matthews, Laboratory Asst 3
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
IA Dept of Agriculture Weights and Measures Division Henry Wallace Bldg Des Moines, IA 50319	(515) 281-5716  (515) 281-5861
Person responsible for program	Jerry L. Bane, Bureau Chief
Contact for additional information	Robert E. Hollis, Metrologist
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
IA Dept of Agriculture Weights and Measures Division Henry Wallace Bldg Des Moines, IA 50319	(515) 281-5716  (515) 281-5861
Person responsible for program	Jerry L. Bane, Bureau Chief
Contact for additional information	Robert E. Hollis, Metrologist
Additional accreditation/recognition	

# Kansas

Accreditation Period: 1994-1996

Laboratory Staff	Address	Telephone Number
Karl A. Herken, State Metrologist  Kevin L. Nutter, Metrologist	Kansas State Board of Agriculture Division of Inspections Weights and Measures Laboratory 2016 SW 37th St Topeka, KS 66611-2570	(913) 267-0278  FAX (913) 267-2518

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight > 1000 lb	F		Weight > 3 kg	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Labor...\$30 per person/per hour, 1/2 hour minimum.

## Remarks:

The Kansas laboratory maintains computerized control charts for use in mass calibrations as part of the measurement control program. Customer services include control chart formulation and evaluation, as well as QA program assistance. The laboratory also offers twine testing with a Scotts Tester.

# Kansas

Grain Moisture Testing	
Address	Telephone Number
Kansas Grain Inspection 700 Jackson, Suite 800 Box 1918 Topeka, KS 66601	(913) 296-3451  Fax (913) 296-4256
Person responsible for program	Thomas Meyer
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Kansas Weights and Measures 2016 SW 37th St Topeka, KS 66611-2570	(913) 267-4641  Fax (913) 267-2518
Person responsible for program	DeVern H. Phillips
Contact for additional information	Lewis J. Hutfles
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Kansas Weights and Measures 2016 SW 37th St Topeka, KS 66611-2570	(913) 267-4641  Fax (913) 267-2518
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	



# Kentucky

Accreditation Period: 1993-1994

Laboratory Staff	Address	Telephone Number
Randall Wise, Metrologist  Leslie Hageman, Agricultural Laboratory Technician	Division of Weights and Measures 106 W 2nd St Frankfort, KY 40601	(502) 564-4870  FAX: (502) 564-5669

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	N	Mass	Weight $\leq$ 3 kg	X
	Weight > 1000 lb	X		Weight > 3 kg	X
Volume	Small $\leq$ 25 gal	N	Volume	Metal Standards	X
	Intermediate 25 - 500 gal	N		Small Glassware	X
	Large > 500 gal	N			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	X
				Rigid Rules	X
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
No fees are charged.

# Kentucky

Grain Moisture Testing	
Address	Telephone Number
Division of Weights and Measures 106 W 2nd St Frankfort, KY 40601	(502) 564-4870
Person responsible for program	Randall Wise
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Division of Weights and Measures 106 W 2nd St Frankfort, KY 40601	(502) 564-4870
Person responsible for program	Vicki Searcy
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# Los Angeles County

Accreditation Period: 1994 - 1996

Laboratory Staff	Address	Telephone Number
Emil Hazarian, Metrologist  Herb Lehman  K. C. Chow	Metrology Laboratory 11012 Garfield Ave South Gate, CA 90280-7598	(310) 940-8931  FAX: (310) 861-0278

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight > 1000 lb	F		Weight > 3 kg	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No certification, contact laboratory for availability.			Length	Steel Tapes	O
				Rigid Rules	O
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
\$49.65 per hour, subject to change

## Remarks:

The Los Angeles County laboratory has participated in the NIST Mass MAP program since 1972.

## Other Tests:

None





# Louisiana

Accreditation Period: 1992-1994

Laboratory Staff	Address	Telephone Number
Pat Chaney, Metrologist  Carl Decker, Metrology Technician	LA Dept of Agriculture and Forestry Metrology Laboratory PO Box 3098 Baton Rouge, LA 70821-3098  Shipping: 5825 Florida Blvd Baton Rouge, LA 70806	(504) 925-3780 Office  (504) 922-1380 Lab  FAX: (504) 922-1289

Services Available					
Tolerance Testing			Calibration		
Mass	Weight ≤ 1000 lb	F	Mass	Weight ≤ 3 kg	F
	Weight > 1000 lb	F		Weight > 3 kg	F
Volume	Small ≤ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	X		Small Glassware	F
	Large > 500 gal	X			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Labor... Length and Volume: \$25 per hour. Minimum one hour charge.  Mass - Tolerance Testing: W $\leq$ 10 lb: \$2; W $\leq$ 100 lb: \$5; W $\leq$ 1000 lb: \$25; W > 1000 lb: \$50;  Mass - Calibration: W $\leq$ 3 kg: \$25; W $\leq$ 30 kg: \$50; W > 30 kg: \$75

## Remarks:

Louisiana moved into a new laboratory in 1989.

# Louisiana

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# Maine

Accreditation Period: 1994 - 1996

Laboratory Staff	Address	Telephone Number
Stanley K. Millay, Metrology Supervisor  Danny Newcombe, Metrologist	ME Dept of Agriculture Division of Regulations Station 28 Augusta, ME 04333	(207) 287-3841  FAX: (207) 287-7161

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight > 1000 lb	X		Weight > 3 kg	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	F
			Temperature	Liquid in Glass Thermometry	X

Fees
Labor...\$40 per hour.

## Remarks:

Maine has an indoor, drive-through, truck compartment volume calibration facility. Maine also provides tolerance testing of stopwatches and calibration of Sardine Carrier holds. The program offers extensive services in wood measurement.

# Maine

Grain Moisture Testing	
Address	Telephone Number
ME Dept of Agriculture Division of Regulations Station 28 Augusta, ME 04333	(207) 289-7550
Person responsible for program	Reginal Andrews
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
ME Dept of Agriculture Division of Regulations Station 28 Augusta, ME 04333	(207) 289-3841
Person responsible for program	Stanley K. Millay
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	



# Maryland

Accreditation Period: 1993-1995

Laboratory Staff	Address	Telephone Number
Charles R. Stockman, Lab Program Manager Steve Barry, Metrology Technician Victor P. DeLibera, Metrology Technician	MD Dept of Agriculture 50 Harry S Truman Pkwy Annapolis, MD 21401	(410) 841-5790 FAX: (410) 841-2765

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight > 1000 lb (up to 20,000 lb)	F		Weight > 3 kg (up to 20,000 lb)	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	F

Fees
Labor...\$45 per hour. Contact laboratory for additional capabilities and fee schedule. Refurbishing of measures/standards is available. Contact laboratory for specifics.

## Remarks:

Maryland moved into a new laboratory in August, 1990. Laboratory tests stopwatches and also dial gauges which are used to test polyethylene sheeting, glassware used for Babcock tests of milk, vapor meters, and slow-flow meters.

# Maryland

Grain Moisture Testing	
Address	Telephone Number
MD Dept of Agriculture 50 Harry S Truman Pkwy Annapolis, MD 21401	(410) 841-5790
Person responsible for program	Charles R. Stockman
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
State of Maryland Motor Fuel Testing Laboratory 7101 Jessup Rd Jessup, MD 20794	(410) 799-7777 (410) 974-3126
Person responsible for program	Robert Crawford
Contact for additional information	Stephen Taylor, Michael Jordan
Additional accreditation/recognition	

National Type Evaluation Program (NTEP)	
Address	Telephone Number
MD Dept of Agriculture 50 Harry S Truman Pkwy Annapolis, MD 21401	(410) 841-5790
Person responsible for program	Constantine V. Cotsoradis
Contact for additional information	
Additional accreditation/recognition	NIST Authorized Laboratory
NTEP testing of commercial scales and weighing devices, liquid measuring devices, and cash registers interfaced with scales.	

# Massachusetts

Accreditation Period: 1994

Laboratory Staff	Address	Telephone Number
Donald W. Smith, Metrologist	MA Division of Standards One Ashburton Place Boston, MA 02108	(617) 727-5698

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight > 1000 lb	X		Weight > 3 kg	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large > 500 gal	X			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Labor...\$45 per hour.

# Massachusetts

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Division of Standards One Ashburton Place Boston, MA 02108	(617) 727-3480
Person responsible for program	Charles H. Carroll
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	



# Michigan

Accreditation Period: 1993-1995

Laboratory Staff	Address	Telephone Number
Ronald Balaze, Metrologist	MI Dept of Agriculture Food Division Ottawa Bldg, 4th Fl PO Box 30017 Lansing, MI 48909  Shipping Address: 320 S. Walnut Lewis-Cass Bldg.	(517) 373-1060 (Office)  (517) 373-9897 (Lab)  FAX: (517) 335-3404

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight > 1000 lb up to 5000 lb	F		Weight > 3 kg	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Labor...\$60 per hour.

## Remarks:

The Michigan laboratory has a 25-gallon slicker plate volume standard for precision volume calibration.

# Michigan

Grain Moisture Testing	
Address	Telephone Number
Food Division Michigan Department of Agriculture PO Box 30017 Lansing, MI 48909	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Food Division Michigan Department of Agriculture PO Box 30017 Lansing, MI 48909	(517) 373-1060
Person responsible for program	Celeste Bennett
Contact for additional information	E. C. Heffron
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
320 S. Walnut Lansing, MI 48909	(517) 373-9897
Person responsible for program	Ronald Balaze
Contact for additional information	
Additional accreditation/recognition	

# Minnesota

Accreditation Period: 1992-1994

Laboratory Staff	Address	Telephone Number
David Dikken, Metrologist  Bruce A. Adams, Metrologist	Dept of Public Service Division of Weights and Measures 2277 Hwy 36 St. Paul, MN 55113	(612) 639-4010  FAX: (612) 639-4014

Services Available					
Tolerance Testing			Calibration		
Mass	Weight ≤ 1000 lb	F	Mass	Weight ≤ 3 kg	F
	Weight > 1000 lb	F		Weight > 3 kg	F
Volume	Small ≤ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	F

Fees
Labor...\$75 per hour.

## Remarks:

Minnesota metrologists have received NIST Mass MAP training, and calibration of precision weights is performed using weighing designs and data are reduced with NIST Mass Code computer software.

# Minnesota

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Minnesota Department of Public Service Weights and Measures Division 2277 Hwy 36 St. Paul, MN 55113	(612) 639-4010
Person responsible for program	Michael Blacik
Contact for additional information	Richard Johnson
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
2277 Hwy 36 St. Paul, MN 55113	(612) 639-4010
Person responsible for program	Bruce A. Adams
Contact for additional information	
Additional accreditation/recognition	Railroad Test Car calibration at Minnesota Master Track Scale.



# Mississippi

Accreditation Period: 1994 - 1996

Laboratory Staff	Address	Telephone Number
Kelvin Boone, Metrologist  Lionel Wilson	PO Box 1200 Alcorn State University Lorman, MS 39096	(601) 877- 3802  FAX: (601) 877-6256

Services Available						
Tolerance Testing			Calibration			
Mass	Weight $\leq$ 1000 lb	N	Mass	Weight $\leq$ 3 kg	N	
	Weight > 1000 lb	X		Weight > 3 kg	N	
Volume	Small $\leq$ 25 gal	N	Volume	Metal Standards	N	
	Intermediate 25 - 500 gal	X		Small Glassware	N	
	Large > 500 gal	X				
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	N	
				Rigid Rules	N	
			Frequency	Tuning Forks	X	
			Temperature	Liquid in Glass Thermometry	X	

Fees
No fees are charged.

# Mississippi

Grain Moisture Testing	
Address	Telephone Number
Moisture Meter Testing Laboratory Delta State University PO Box 3323 Cleveland, MS 38733	(601) 843-1078 (601) 354-7077
Person responsible for program	Janice Proctor
Contact for additional information	William Eldridge
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Mississippi Department of Agriculture and Commerce Petroleum Testing Division PO Box 1609 Jackson, MS 39215-1609	(601) 354-6202
Person responsible for program	Tommy Harrell
Contact for additional information	Connie Braswell
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# Missouri

Accreditation Period: 1994

Laboratory Staff	Address	Telephone Number
Robert D. Wittenberger, Laboratory Program Supervisor, Metrologist	Mailing: MO Dept of Agriculture PO Box 630 Jefferson City, MO 65102 Shipping: 1616 Missouri Blvd Jefferson City, MO 65109	(314) 751-3440  FAX: 314-751-0281

## Services Available

Tolerance Testing			Calibration		
Mass	Weight ≤ 1000 lb	F	Mass	Weight ≤ 3 kg	F
	Weight > 1000 lb	F		Weight > 3 kg	F
Volume	Small ≤ 25 gal	F	Volume	Metal Standards	O
	Intermediate 25 - 500 gal	F		Small Glassware	O
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	O
				Rigid Rules	O
			Frequency	Tuning Forks	O
			Temperature	Liquid in Glass Thermometry	X

## Fees

Labor...\$25 per hour, tolerance testing; \$35 per hour, calibration. One hour minimum charge, time over one hour rounded to the nearest hour.

# Missouri

Grain Moisture Testing	
Address	Telephone Number
1616 Missouri Blvd Jefferson City, MO 65109	(314) 751-3440
Person responsible for program	Robert D. Wittenberger
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
1620 Missouri Blvd Jefferson City, MO 65109	(314) 751-2922
Person responsible for program	Ronald G. Hayes
Contact for additional information	Carolyn Kempker
Additional accreditation/recognition	ASTM

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	



# Montana

Accreditation Period: 1993 - 1994

Laboratory Staff	Address	Telephone Number
Dan Nisbet, Metrologist	Bureau of Weights and Measures 1424 E 9th Ave Helena, MT 59620-0423	(406) 449-2582

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	X
	Weight $>$ 1000 lb	F		Weight $>$ 3 kg	X
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	X
	Intermediate 25 - 500 gal	F		Small Glassware	X
	Large $>$ 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	X
				Rigid Rules	X
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Labor...\$75 per hour (as of 1/1/94)

## Remarks:

Laboratory is not operated on a full-time basis.

# Montana

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# Nebraska

Accreditation Period: 1994

Laboratory Staff	Address	Telephone Number
Craig Olsen, Metrologist	Division of Weights and Measures PO Box 94757 Lincoln, NE 68509 NE Standards Lab, 3705 S 14th St Lincoln, NE 68502	(402) 471-4292 Office  FAX: (402) 471-3252 Office  (402) 479-4171 Lab  FAX: (402) 471-0091 Lab

## Services Available

Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	X
	Weight > 1000 lb	F		Weight > 3 kg	X
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	X
	Intermediate 25 - 500 gal	F		Small Glassware	X
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	X
				Rigid Rules	X
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

## Fees

Labor...\$23 per hour. Plus materials, and time spent cleaning.

Mass: Class F: Other Sets:

Number of weights

1 - 14 \$24 \$30

15 - 25 32 50

26 - 38 48 70

> 38 \$1 each additional weight

< 1/4 oz \$23/hour; 1/4 oz < W  $\leq$  5 lb: \$5; 5  $\leq$  50 lb: \$8; 50  $\leq$

1000: \$12.

Length and Volume:

flasks: < gill: \$6.50; gill - pint: \$9; quart: \$10.50;

1/2 gal: \$13.50; gallon: \$16.00;  $\leq$  5 gallon: \$12; 5-25 gallon:

\$25; 25-100 gallon: \$35.

tapes: 3 ft - 100 ft: \$1 per interval.

# Nebraska

Grain Moisture Testing	
Address	Telephone Number
Nebraska Public Service Commission PO Box 94927 Lincoln, NE 68509-4927	(402) 471-0235
Person responsible for program	John Fecht/Don Onweiler
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	



# Nevada

Accreditation Period: 1993-1995

Laboratory Staff	Address	Telephone Number
Steve Grabski, Metrologist	NV Dept of Business & Industry Division of Agriculture Weights and Measures Section PO Box 11100 Reno, NV 89510-1100  Shipping: 2150 Frazer Ave Sparks, NV 89431	(702) 688-1166  FAX: (702) 688-1178

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight > 1000 lb	F		Weight > 3 kg	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Labor...\$20 per hour, plus parts and shipping costs.

# Nevada

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE Historical Information: Was available years ago and performed by the Division of Agriculture Seed Analyst. PO Box 11100 Reno, NV 89510-1100	(702) 688-1180
Person to contact for additional information	Randy Bradley, Seed Analyst
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
PO Box 11100, 350 Capitol Hill St Reno, NV 89510-1100	(702) 688-1180
Person responsible for program	Robert Gronowski, Plant Industry Director
Contact for additional information	Debbie Furrie, Petroleum Chemist
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# New Hampshire

Not Currently Accredited

Laboratory Staff	Address	Telephone Number
Michael F. Grenier, Director/Metrologist Richard Cote, Investigator/Metrologist	NH Department of Agriculture Caller Box 2042 10 Ferry St Concord, NH 03301-2042	(603) 271-3709 FAX: (603) 271-1109

## Services Available

Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	X	Mass	Weight $\leq$ 3 kg	X
	Weight > 1000 lb	X		Weight > 3 kg	X
Volume	Small $\leq$ 25 gal	X	Volume	Metal Standards	X
	Intermediate 25 - 500 gal	X		Small Glassware	X
	Large > 500 gal	X			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	X
				Rigid Rules	X
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

## Fees

Labor...\$40 per hour.

Glass flasks: \$15; V  $\leq$  5-gal: \$20; 5 gal < V  $\leq$  25 gal: \$20; 25 gal < V  $\leq$  150 gal: \$125;  
Compartment calibrations: 1st 100 gal: \$40; Each addl 100 gal \$1.50

Class F Test weights, meeting specifications and tolerances contained in NIST Handbook 105-1:  
30 lb weight kit: \$45; 5, 10, 25, 50 lb weights: \$10 each  
W < 500 lb: \$10 each; W > 500 lb: \$25 each;

Length: Rigid rules: \$10; Steel tapes  $\leq$  50 feet: \$15; 50 ft < L  $\leq$  100 ft: \$25 each

# New Hampshire

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
10 Ferry St Concord, NH 03301-2042	(603) 271-3709
Person responsible for program	Michael F. Grenier
Contact for additional information	
Additional accreditation/recognition	Testing of Wheel Load Weighers



# New Jersey

Accreditation Period: 1992-1994

Laboratory Staff	Address	Telephone Number
Walter L. Smith, Inspector I	Office of Weights and Measures 1261 US Rte 1 and 9 South Avenel, NJ 07001	(908) 815-4840

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	N	Mass	Weight $\leq$ 3 kg	N
	Weight > 1000 lb	X		Weight > 3 kg	N
Volume	Small $\leq$ 25 gal	N	Volume	Metal Standards	N
	Intermediate 25 - 500 gal	N		Small Glassware	N
	Large > 500 gal	N			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	N
				Rigid Rules	N
			Frequency	Tuning Forks	N
			Temperature	Liquid in Glass Thermometry	X

Fees
No fees are charged at this time. The State Office of Weights and Measures is proposing to enact a schedule of fees for the above-

## New Jersey

Grain Moisture Testing	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Office of Weights and Measures 1261 Routes 1 and 9 South Avenel, NJ 07001-1647	(908) 815-4840
Person responsible for program	Herbert Sehgel, Chief Supervisor
Contact for additional information	
Additional accreditation/recognition	

### Remarks:

The laboratory is also used to conduct evaluations and tests for the State type-approval of small capacity weighing and measuring devices.

# New Mexico

Accreditation Period: 1994-1996

Laboratory Staff	Address	Telephone Number
Richard F. Schulmeister, Metrologist Phyllis Cunningham, Lab Technician	NM Dept of Agriculture Standards and Consumer Services PO Box 30005 Dept 3170 Las Cruces, NM 88003-0005	(505) 646-1616 FAX: (505) 646-3303

## Services Available

Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight > 1000 lb	F		Weight > 3 kg	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	F
			Temperature	Liquid in Glass Thermometry	X

## Fees

Labor...\$28 per hour. Minimum 1/2 hour charge.

## New Mexico

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
PO Box 30005, Dept 3170 Corner of Gregg and Espina Las Cruces, NM 88003-0005	(505) 646-1616  FAX: (505) 646-3303
Person responsible for program	Gary West
Contact for additional information	Floyd Highfill
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	



# New York

Accreditation Period: 1993-1995

Laboratory Staff	Address	Telephone Number
Ross J. Andersen, Asst. Director  William Fishman, Metrologist  Ed Szesnat, Metrologist	Bureau of Weights and Measures Bldg 7A State Campus Albany, NY 12235	(518) 457-3452 (518) 457-3146  FAX: (518) 457-2552

Services Available					
Tolerance Testing			Calibration		
Mass	Weight ≤ 1000 lb	F	Mass	Weight ≤ 3 kg	F
	Weight > 1000 lb up to 3000 lb	F		Weight > 3 kg	F
Volume	Small ≤ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	F

Fees
Labor...Special Tests: \$75 per hour.  Fees vary according to type of artifact and type of service requested. Contact laboratory directly for specific fee information.

## Remarks:

The New York laboratory also tests stopwatches.

## New York

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Bureau of Weights and Measures I Winners Circle Albany, NY 12235	(518) 457-3146
Person responsible for program	John J. Bartfai
Contact for additional information	Ross J. Andersen
Additional accreditation/recognition	

National Type Evaluation Program (NTEP)	
Address	Telephone Number
Bureau of Weights and Measures Bldg 7-A, State Campus Albany, NY 12235	(518) 457-3452
Person responsible for program	John J. Bartfai
Contact for additional information	Ross J. Andersen, William Fishman, Ed Szesnat
Additional accreditation/recognition	NIST Authorized Laboratory
NTEP testing of scales, other weighing systems, electronic cash registers interfaced with scales and taximeters.	

# North Carolina

Accreditation Period: 1992-1994

Laboratory Staff	Address	Telephone Number
L. F. Eason, Standards Laboratory Manager Sherry Teachey, Quality Assurance Manager Sharon Denning, Metrologist Karen Bryan, Metrologist Van Hyder, Metrologist	NC Dept of Agriculture/Dept SD Standards Laboratory PO Box 27647 Raleigh, NC 27611  Shipping: 4040 District Drive, Raleigh, NC 27607	(919) 733-4411  FAX: (919) 733-8804 (lab)

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight > 1000 lb	F		Weight > 3 kg	F
Volume	Small $\leq$ 25 gal	*F	Volume	Metal Standards	*F
	Intermediate 25 - 500 gal	*F		Small Glassware	F
	Large > 500 gal	*F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	F

Fees
<p>* Fees are not charged for work related to petroleum measurements if devices are used within North Carolina. This part of the program is funded by other fees. Fees are established pursuant to Section 1, Article 1 of Chapter 81A of the General Statutes and vary according to type of artifact and type of service requested. Contact the laboratory directly for fee information.</p>

# North Carolina

Grain Moisture Testing	
Address	Telephone Number
NC Dept of Agriculture Standards Laboratory PO Box 27647 Raleigh, NC 27611	(919) 733-4411  FAX: (919)-733-8804
Person responsible for program	Cheryl Tew
Contact for additional information	L. F. Eason
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
NC Dept of Agriculture Motor Fuels Laboratory PO Box 27647 Raleigh, NC 27611	(919) 733-3246  FAX: (919) 733-2928
Person responsible for program	Duane Scott
Contact for additional information	Winston Sutton
Additional accreditation/recognition	National Regional Exchange Program, ASTM Member

National Type Evaluation Program (NTEP)	
Address	Telephone Number
NC Dept of Agriculture Standards Division PO Box 27647 Raleigh, NC 27611	(919) 733-3313  FAX: (919) 715-0524
Person responsible for program	N. David Smith
Contact for additional information	Ronald Murdock
Additional accreditation/recognition	NIST Authorized Laboratory
NTEP testing of field performance evaluations on liquid measuring devices.	



# North Dakota

Accreditation Period: 1994

Laboratory Staff	Address	Telephone Number
Alan Moch, Director	Public Service Commission Testing and Safety Division State Capitol Bismarck, ND 58505	(701) 224-2400
Mike Pinagel, Metrologist		FAX: (701) 224-2410
Dave Jordheim, Inspector		

## Services Available

Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	X
	Weight > 1000 lb	F		Weight > 3 kg	X
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	X
	Intermediate 25 - 500 gal	F		Small Glassware	X
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	X
				Rigid Rules	X
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

## Fees

Labor...\$12.50 per quarter hour, per person.

# North Dakota

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Health and Consolidated laboratories 2635 E. Main Bismarck, ND 58501-0937	(701) 221-6393
Person responsible for program	Bob Vandal
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# Ohio

Accreditation Period: 1994

Laboratory Staff	Address	Telephone Number
Ken Johnson, Metrologist  William West, Laboratory Supervisor  Jim Truex, Inspection Manager	OH Dept of Agriculture Division of Weights and Measures 8995 E Main St/ Bldg 5 Reynoldsburg, OH 43068	(614) 866-6361  FAX: (614) 866-4174

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	X
	Weight > 1000 lb	F		Weight > 3 kg	X
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	X
	Intermediate 25 - 500 gal	F		Small Glassware	X
	Large > 500 gal	X			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	X
				Rigid Rules	X
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Fees are established pursuant to Section 901.43 of the Ohio Revised Code and vary according to type of artifact and type of service requested. Contact the laboratory directly for fee information.

# Ohio

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

National Type Evaluation Program (NTEP)	
Address	Telephone Number
OH Department of Agriculture Division of Weights and Measures 8995 E Main St/Bldg 5 Reynoldsburg, OH 43068	(614) 866-6361
Person responsible for program	Jim Truex
Contact for additional information	William West, Supervisor, or Bob Badenhop, Technician
Additional accreditation/recognition	NIST Authorized Laboratory
NTEP testing of commercial scales, other weighing devices and electronic cash registers interfaced with scales. Performance testing of retail motor fuel dispensers.	



# Oklahoma

Accreditation Period: 1993-1995

Laboratory Staff	Address	Telephone Number
Ken L. Fraley, Metrologist  Richard Gonzales, Sr Laboratory Technician	Bureau of Standards Laboratory Division 2800 N Lincoln Blvd Oklahoma City, OK 73105	(405) 521-3864 X370  FAX: (405) 521-4912

Services Available					
Tolerance Testing			Calibration		
Mass	Weight ≤ 1000 lb	F	Mass	Weight ≤ 3 kg	F
	Weight > 1000 lb	F		Weight > 3 kg	F
Volume	Small ≤ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large > 500 gal	X			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Labor...\$25 per hour for special tests not listed in the fee schedule. Fees vary according to type of artifact and type of service requested. Contact laboratory directly for specific fee information.

# Oklahoma

Grain Moisture Testing	
Address	Telephone Number
Bureau of Standards 2800 N Lincoln Oklahoma City, OK 73105	(405) 521-3864 X370
Person responsible for program	Ken Fraley
Contact for additional information	Richard Gonzales
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Oklahoma Corporation Commission Fuel Inspection Division 130 NE 23rd ST Oklahoma City, OK 73105	(405) 521-2487
Person responsible for program	Ron Hamilton
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# Oregon

Accreditation Period: 1994

Laboratory Staff	Address	Telephone Number
Jim Ross, Metrologist	OR Dept of Agriculture Msmt Standards Division 635 Capitol St NE Salem, OR 97310-0110	(503) 378-5504  FAX: (503) 378-6525

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	X
	Weight $>$ 1000 lb	F		Weight $>$ 3 kg	X
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	X
	Intermediate 25 - 500 gal	F		Small Glassware	X
	Large $>$ 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	X
				Rigid Rules	X
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Labor...\$50 per hour with 1/4 hr minimum.

# Oregon

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Measurement Standards Division Oregon Department of Agriculture 635 Capitol St NE Salem, OR 97310-0110	(503) 373-0964
Person responsible for program	Ken Simila
Contact for additional information	
Additional accreditation/recognition	

National Type Evaluation Program (NTEP)	
Address	Telephone Number
Oregon Department of Agriculture Measurement Standards Division 635 Capitol St NE Salem, OR 97310-0110	(503) 378-3792
Person responsible for program	George Shefcheck
Contact for additional information	
Additional accreditation/recognition	NIST Authorized Laboratory
NTEP field performance evaluations on vehicle, axle-load, livestock and floor scales.	



# Pennsylvania

Accreditation Period: 1993-1995

Laboratory Staff	Address	Telephone Number
John E. Fisher, Lab Division Chief G. Edward Carpenter, Metrologist Peter Millvan, Metrologist	Dept of General Services 2221 Forster St Room G-28 Harrisburg, PA 17125  Metrology Laboratory B 124 Transportation and Safety Bldg Commonwealth Ave & North St Harrisburg, PA 17120	(717) 787-6426  FAX: (717) 783-6241

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	N	Mass	Weight $\leq$ 3 kg	N
	Weight > 1000 lb	N		Weight > 3 kg	N
Volume	Small $\leq$ 25 gal	N	Volume	Metal Standards	N
	Intermediate 25 - 500 gal	N		Small Glassware	N
	Large > 500 gal	X			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	N
				Rigid Rules	N
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
No fees are charged.

# Pennsylvania

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
NONE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# Puerto Rico

Accreditation Period: 1992-1994

Laboratory Staff	Address	Telephone Number
Edmundo Rosario-Fred, Technician	Commonwealth of Puerto Rico Dept of Consumer Affairs PO Box 41059 Minillas Station Santurce, Puerto Rico 00940  Weights and Measures Laboratory 722 Hoare St Santurce, PR 00908	(809) 724-5153  FAX: (809) 726-6570

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight $>$ 1000 lb	F		Weight $>$ 3 kg	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large $>$ 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Fees are established in accordance with the Law of Weights and Measures of the Commonwealth of Puerto Rico jointly with the Organic Law of the Department of Consumer Affairs. Fees vary according to type of artifact and type of service requested.

## Remarks:

Laboratory also tests density hydrometers used to test sugars, refractometers, and polarimeters.

## Puerto Rico

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Department of Consumer Affairs 722 Hoare St Santurce, PR 00908	(809) 724-5153
Person responsible for program	Heliodoro Lopez Torres
Contact for additional information	Heliodoro Lopez Torres
Additional accreditation/recognition	contract testing

Additional Tests or Laboratory Functions	
Address	Telephone Number
Weights & Measures Laboratory 722 Hoare St Santurce, PR 00908	(809) 724-5153
Person responsible for program	Edmundo Rosario-Fred, Technician
Contact for additional information	
Additional accreditation/recognition	Thermo-hydrometer Testing



# Rhode Island

Not Currently Accredited

Laboratory Staff	Address	Telephone Number
Lynda Agresti Maurer, Supervising Metrologist	Dept of Labor 610 Manton Avenue Providence, RI 02909	(401) 457-1867  FAX: 401-457-1893

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	X	Mass	Weight $\leq$ 3 kg	X
	Weight > 1000 lb	X		Weight > 3 kg	X
Volume	Small $\leq$ 25 gal	X	Volume	Metal Standards	X
	Intermediate 25 - 500 gal	X		Small Glassware	X
	Large > 500 gal	X			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	X
				Rigid Rules	X
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
No fees are charged.

## Remarks:

Laboratory is not operated on a full-time basis.

## Rhode Island

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Tax Administration One Capitol Hill Providence, RI 02908-5800	(401) 277-3050
Person responsible for program	Gary Clark
Contact for additional information	Robert Geruso
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# South Carolina

Accreditation Period: 1993-1995

Laboratory Staff	Address	Telephone Number
John V. Pugh, Metrology Laboratory Dir	Dept of Agriculture/Cons Protection PO Box 11280 Columbia, SC 29211 Shipping: 237 Catawba St Columbia, SC 29201	(803) 737-2080 (office)
Billy Kennington, Metrologist		(803) 253-4052 (lab)
Mitch Elliot, Metrologist		FAX: (803) 737-2068

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	N	Mass	Weight $\leq$ 3 kg	N
	Weight > 1000 lb	N		Weight > 3 kg	N
Volume	Small $\leq$ 25 gal	N	Volume	Metal Standards	N
	Intermediate 25 - 500 gal	N		Small Glassware	N
	Large > 500 gal	N			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	N
				Rigid Rules	N
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
No fees are charged.

## South Carolina

Grain Moisture Testing	
Address	Telephone Number
PO Box 11280 Columbia, SC 29211	(803) 253-4052
Person responsible for program	John V. Pugh
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
PO Box 11280 Columbia, SC 29211	(803) 737-2070
Person responsible for program	Dr. Thomas W. Brooks
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	



# South Dakota

Accreditation Period: 1994

Laboratory Staff	Address	Telephone Number
James Peskey, Sr. Retail Inspector Leonard G. Bies, Sr. Inspector Paul Merriman, Inspector	Division of Commercial Inspection and Regulation Office of Weights and Measures 118 W Capitol Pierre, SD 57501	(605) 773-3697 FAX: (605) 773-6631

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	X
	Weight > 1000 lb	F		Weight > 3 kg	X
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	X
	Intermediate 25 - 500 gal	X		Small Glassware	X
	Large > 500 gal	X			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	X
				Rigid Rules	X
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Labor...\$20 per hour.

## Remarks:

Laboratory is not operated on a full-time basis.

## South Dakota

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
See laboratory address	
Person responsible for program	James Peskey, Sr. Retail Inspector
Contact for additional information	Michael Kumm, Director
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# Tennessee

Accreditation Period: 1994

Laboratory Staff	Address	Telephone Number
Robert G. Williams, Supervisor  Tom Smith, Metrologist	TN Dept of Agriculture PO Box 40627 Melrose Station Nashville, TN 37204	(615) 360-0159 Office  (615) 360-0158 Lab  FAX: (615) 360-0194

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	N	Mass	Weight $\leq$ 3 kg	X
	Weight > 1000 lb	X		Weight > 3 kg	X
Volume	Small $\leq$ 25 gal	N	Volume	Metal Standards	X
	Intermediate 25 - 500 gal	X		Small Glassware	X
	Large > 500 gal	X			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	X
				Rigid Rules	X
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
No fees are charged.

# Tennessee

Grain Moisture Testing	
Address	Telephone Number
TN Dept of Agriculture Quality and Standards PO Box 40627 Nashville, TN 37204	(615) 360-0159
Person responsible for program	Robert G. Williams, Standards Administrator
Contact for additional information	Cathryn Pittman, Technologist
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
TN Dept of Agriculture Quality and Standards Holeman Bldg, PO Box 40627 Nashville, TN 37204	(615) 360-0147
Person responsible for program	Randy Jennings, Petroleum Administrator
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	



# Texas

Accreditation Period: 1993-1995

Laboratory Staff	Address	Telephone Number
James H. Eskew, Coordinator for Metrology Labs/ Weights and Measures  Metrology Lab Supervisor, Vacant  Patrick Forester, Metrologist  Rodger Brown, Metrologist  Sheila Gonzales, Admin. Asst., Metrology Lab  Jeanne Carter, Admin. Asst., Wts. & Measures  Randy Calcote, Metrologist, Lubbock	TX Dept of Agriculture Metrology Laboratory 119 Cumberland Rd Austin, TX 78704	(512) 462-1441  FAX: (512) 475-1642       Lubbock Laboratory: (806) 799-8555

Services Available						
Tolerance Testing			Calibration			
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F	
	Weight > 1000 lb	F		Weight > 3 kg	F	
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F	
	Intermediate 25 - 500 gal	F		Small Glassware	F	
	Large > 500 gal	F				
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F	
				Rigid Rules	F	
			Frequency	Tuning Forks	X	
			Temperature	Liquid in Glass Thermometry	X	

Fees
Mass, Tolerance Testing: $W < 10$ lb: \$2; $10 \leq W < 500$ lb: \$5; $500 \leq W < 2500$ lb: \$10; $W \geq 2500$ lb: \$20. Mass, Calibrations: $W \leq 3$ kg: \$25 each; $3 \text{ kg} < W \leq 30$ kg: \$50 each; $W > 30$ kg: \$70 each.  Volume: $V \leq 5$ gal: \$10; $V > 5$ gal: \$10 plus \$0.20 per gal over 5 gallons; glassware: \$25 per increment.  Length: \$25 per increment.

## Remarks:

Texas has independent laboratory rooms, balances, and standards for calibration and tolerance testing of mass. Calibrations up to 2500 lb, and tolerance testing up to 5000 lb are possible.



# Texas

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# Utah

Accreditation Period: 1993-1994

Laboratory Staff	Address	Telephone Number
Anthony De Arcos, Metrologist	UT Dept of Agriculture Regulatory Services Division 350 N Redwood Rd Salt Lake City, UT 84116	(801) 538-7153  FAX: (801) 538-7126

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	X
	Weight > 1000 lb	F		Weight > 3 kg	X
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	X
	Intermediate 25 - 500 gal	F		Small Glassware	X
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	X
				Rigid Rules	X
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Contact laboratory for fee information.

# Utah

Grain Moisture Testing	
Address	Telephone Number
	(801) 392-2292
Person responsible for program	C. Larry Warner
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
UT Department of Agriculture Weights and Measures Division 350 N Redwood Rd Salt Lake City, UT 84116	(801) 538-7154
Person responsible for program	Monty Brown
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# Vermont

Accreditation Period: 1994 - 1996

Laboratory Staff	Address	Telephone Number
Raymond P. Cioffi, Metrologist/Weights and Measures Specialist	Vermont Department of Agriculture Labs 103 S Main St Waterbury, VT 05671-0101	(802) 244-4511 Lab  FAX: (802) 241-3008

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight > 1000 lb	X		Weight > 3 kg	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large > 500 gal	X			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	O
				Rigid Rules	X
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Labor...\$40 per hour.  Syrup hydrometers: \$1.25 Sap hydrometers and certificate: \$3. Refractometers: \$40 per hour.

## Remarks:

Laboratory tests density hydrometers which are used in the syrup industry. Laboratory is not operated on a full-time basis. Wheel Load Weighers also tested \$40.00/hr.

# Vermont

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Consumer Assurance Section VT Department of Agriculture Food and Markets 120 State St Montpelier, VT 05620-2901	(802) 828-2436
Person responsible for program	Bruce Martell
Contact for additional information	Ray Cioffi
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Vermont Department of Agriculture Labs 103 S Main St Waterbury, VT 05671-0101	(802) 244-4510
Person responsible for program	Bruce Martell
Contact for additional information	Ray Cioffi
Additional accreditation/recognition	Wheel Load Weigher Testing



# Virginia

Accreditation Period: 1992-1994

Laboratory Staff	Address	Telephone Number
Michael J. Kramer, Inspector  Milt Hargrave, Inspector II	VA Dept of Agriculture and Consumer Services PO Box 1163 Rm 403 Richmond, VA 23209	(804) 786-0479  FAX: (804) 371-0351

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	N	Mass	Weight $\leq$ 3 kg	N
	Weight > 1000 lb	N		Weight > 3 kg	N
Volume	Small $\leq$ 25 gal	N	Volume	Metal Standards	N
	Intermediate 25 - 500 gal	N		Small Glassware	N
	Large > 500 gal	N			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	N
				Rigid Rules	N
			Frequency	Tuning Forks	N
			Temperature	Liquid in Glass Thermometry	N

Fees
No fees are charged.

## Remarks:

Laboratory also tests Babcock dairy bottles and other associated glassware.

# Virginia

Grain Moisture Testing	
Address	Telephone Number
VA Department of Agriculture and Consumer Services PO Box 1163 Richmond, VA 23209	(804) 786-3939
Person responsible for program	W. Randy Sanford
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
VA Department of Agriculture and Consumer Services PO Box 1163 Richmond, VA 23209	(804) 786-2476  (804) 786-3993 Laboratory
Person responsible for program	Supervisory Weights and Measures Staff
Contact for additional information	W. E. Fowler, Senior Chemist
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# Virgin Islands

Not Currently Accredited

Laboratory Staff	Address	Telephone Number
Archie Corbitt, Chief Inspector	Department of Licensing and Consumer Affairs Golden Rock Shopping Center Christiansted St VI 00820	(809) 773-2226 (St. Croix)  FAX: (809) 778-8250

Services Available					
Tolerance Testing			Calibration		
Mass	Weight ≤ 1000 lb	X	Mass	Weight ≤ 3 kg	X
	Weight > 1000 lb	X		Weight > 3 kg	X
Volume	Small ≤ 25 gal	X	Volume	Metal Standards	X
	Intermediate 25 - 500 gal	X		Small Glassware	X
	Large > 500 gal	X			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	X
				Rigid Rules	X
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees

## Remarks:

Laboratory equipment and standards were destroyed by Hurricane Hugo in 1989.

# Virgin Islands

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# Washington

Accreditation Period: 1994

Laboratory Staff	Address	Telephone Number
James H. Cammel, Metrologist, Inspector III  John W. Allen, Asst Metrologist	Dept of Agriculture Weights and Measures Section PO Box 42560 Olympia, WA 98504-2560	(206) 753-5042 FAX: (206) 902-2086

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight > 1000 lb	F		Weight > 3 kg	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
<p>Fees vary according to type of artifact and type of service requested. Contact laboratory directly for specific fee information.</p> <p>Repairs, if necessary, will be made only with owner-approval at the rate of \$26.75 per hour.</p>



# Washington

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Bob Arrington	(206) 902-1856
Person responsible for program	Bob Arrington
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# West Virginia

Accreditation Period: 1994

Laboratory Staff	Address	Telephone Number
Dannie Abshire, Inspector II  Dave Hopkins	WV Dept of Labor Weights and Measures Division 570 MacCorkle Ave St. Albans, WV 25117	(304) 722-0602  FAX: (304) 722-0605

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	N	Mass	Weight $\leq$ 3 kg	X
	Weight > 1000 lb	N		Weight > 3 kg	X
Volume	Small $\leq$ 25 gal	N	Volume	Metal Standards	X
	Intermediate 25 - 500 gal	N		Small Glassware	X
	Large > 500 gal	N			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	X
				Rigid Rules	X
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
No fees are charged.

# West Virginia

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
NOT AVAILABLE - New law effective in May, 1994. Program under development.	(304) 722--0602
Person responsible for program	Karl Angell
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# Wisconsin

Accreditation Period: 1994 - 1996

Laboratory Staff	Address	Telephone Number
James H. Akey, Metrologist  Alan Porter, Technical Supervisor	WI Dept of Agriculture Trade and Consumer Protection 4702 University Ave Madison, WI 53705  PO Box 7883 Madison, WI 53707-7883	(608) 267-3510 Lab  FAX: (608) 266-1560

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	F
	Weight > 1000 lb up to 2500 lb	F		Weight > 3 kg	F
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards	F
	Intermediate 25 - 500 gal	F		Small Glassware	F
	Large > 500 gal	F			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	F
				Rigid Rules	F
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Labor...\$75 per hour. Minimum charge is 1/2 hour.  Contact laboratory for costs on individual piece work for weights, weight kits, provers.

## Remarks:

The Wisconsin laboratory also provides vapor meter testing with a bell jar prover.

# Wisconsin

Grain Moisture Testing	
Address	Telephone Number
PO Box 7883 Madison, WI 53707-7883	(608) 267-3510
Person responsible for program	James H. Akey
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Department of Industry, Labor and Human Relations Petroleum Inspection 201 E Washington Ave Madison, WI 53703	(608) 266-8076
Person responsible for program	Darla Legrave
Contact for additional information	William Morrissey
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
PO Box 7883 Madison, WI 53707-7883  4720 University Avenue Madison, WI 53705	(608) 267-3510
Person responsible for program	James Akey
Contact for additional information	
Additional accreditation/recognition	Wheel load weighers



# Wyoming

Accreditation Period: 1994

Laboratory Staff	Address	Telephone Number
Victor Gerber, Metrologist	WY Dept of Agriculture 2219 Carey Ave Cheyenne, WY 82002	(307) 777-6586  FAX: (307) 777-6593

Services Available						
Tolerance Testing			Calibration			
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg		X
	Weight > 1000 lb	F		Weight > 3 kg		X
Volume	Small $\leq$ 25 gal	F	Volume	Metal Standards		X
	Intermediate 25 - 500 gal	F		Small Glassware		X
	Large > 500 gal	O				
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes		X
				Rigid Rules		X
			Frequency	Tuning Forks		N
			Temperature	Liquid in Glass Thermometry		X

Fees
Labor...\$20.00 per hour.

# Wyoming

Grain Moisture Testing	
Address	Telephone Number
NOT AVAILABLE	
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

Petroleum Quality Testing	
Address	Telephone Number
Chemistry and Bacteriological Laboratory 1174 Snowy Range Rd. Laramie, WY 82070	(307) 742-2984  FAX: (307) 742-2156
Person responsible for program	Ken Mcmillan, State Chemist
Contact for additional information	
Additional accreditation/recognition	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	

# USDA/FGIS

Accreditation Period: 1992-1994

Laboratory Staff	Address	Telephone Number
Paul Hadyka, Industrial Specialist	USDA/FGIS	(202) 720-0262 (DC)
Willis Norrs, Industrial Specialist	Room 1640-S PO Box 96454	FAX: (202) 720-1015
Fred Anderson, Industrial Specialist	1400 Independence Ave SW	(708) 458-0655 (IL)
	Washington, DC 20090-6454	FAX: (708) 458-0749
	Master Scale Depot	
	5800 W. 69th St	
	Chicago, IL 60638	

Services Available					
Tolerance Testing			Calibration		
Mass	Weight $\leq$ 1000 lb	F	Mass	Weight $\leq$ 3 kg	X
	Weight > 1000 lb up to 10,000 lb	F		Weight > 3 kg up to 10,000 lb	F
Volume	Small $\leq$ 25 gal	X	Volume	Metal Standards	X
	Intermediate 25 - 500 gal	X		Small Glassware	X
	Large > 500 gal	X			
O: Service to parent organization only; F: Service available on a fee basis; N: Service available, no fee; X: No accreditation, contact laboratory for availability.			Length	Steel Tapes	X
				Rigid Rules	X
			Frequency	Tuning Forks	X
			Temperature	Liquid in Glass Thermometry	X

Fees
Labor...\$41.90 per hour.

## Remarks:

Tolerance testing of 25- and 50-lb test weights and mass standards from 500 lb to 10,000 lb is provided by at: USDA, FGIS, Master Scale Depot, 5800 W. 69th St, Chicago, IL 60638. Also calibration of 2,500 to 10,000 lb at Master Scale.

# USDA/FGIS

Grain Moisture Testing	
Address	Telephone Number
USDA FGIS Standardization QC Branch PO Box 20285 Kansas City, MO 64195	(816) 891-8070  (816) 374-6547
Person responsible for program	James Rampton
Contact for additional information	Ron Bicak
Additional accreditation/recognition	

National Type Evaluation Program (NTEP)	
Address	Telephone Number
USDA, FGIS Room 1640-S PO Box 96454 Washington, D.C. 20090-6454	(202) 720-0262
Person responsible for program	Richard Pforr
Contact for additional information	
Additional accreditation/recognition	NIST Authorized Participating Laboratory
NTEP testing of automatic bulk weighing systems, railway track scales, and grain moisture scales.	

Additional Tests or Laboratory Functions	
Address	Telephone Number
Person responsible for program	
Contact for additional information	
Additional accreditation/recognition	







# *NIST* Technical Publications

## *Periodical*

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**Journal of Research of the National Institute of Standards and Technology**—Reports NIST research and development in those disciplines of the physical and engineering sciences in which the Institute is active. These include physics, chemistry, engineering, mathematics, and computer sciences. Papers cover a broad range of subjects, with major emphasis on measurement methodology and the basic technology underlying standardization. Also included from time to time are survey articles on topics closely related to the Institute's technical and scientific programs. Issued six times a year.

## *Nonperiodicals*

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**Monographs**—Major contributions to the technical literature on various subjects related to the Institute's scientific and technical activities.

**Handbooks**—Recommended codes of engineering and industrial practice (including safety codes) developed in cooperation with interested industries, professional organizations, and regulatory bodies.

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