ORDER OF THE STATE OF WISCONSIN NATURAL RESOURCES BOARD
REPEALING AND RECREATING RULES

The Wisconsin Department of Natural Resources proposes an order to repeal and recreate NR 149 relating to laboratory certification and registration.

SS-06-06

Summary Prepared by the Department of Natural Resources

1. Statute Interpreted

s. 299.11, Stats.

2. Statutory Authority

ss. 299. 11 (3), 229.11 (4), 299.11 (5), 299.11 (7), 299.11(8), 299.11 (9), Stats.

3. Explanation of Agency Authority

Section 299. 11 (4), Stats. defines the applicability of the certification and registration rules to laboratories submitting data for covered programs. Section 299. 11 (7) Stats. authorizes the department to promulgate rules for the certification of laboratories submitting data for covered program. Section 299.11 (8) Stats. authorizes the department to promulgate rules for the registration of laboratories submitting data for covered programs. Section 299.11 (9) Stats. authorizes the department to establish a regulated schedule of fees to cover the costs of administering a laboratory certification and registration program. Section 299.11 (3) Stats. authorizes the department to seek recommendations of the certification standards review council for the general administration of the laboratory certification and registration program. Section 299. 11 (5) Stats. allows the department to recognize certifications from other agencies, governments, and private organizations.

4. Related Statute or Rule

Sections 15.107 (12) and 93.12, Stats. Chs. NR 110, 113, 123, 131, 132, 140, 150, 157, 158, 182, 206, 210, 211, 212, 214, 216, 219, 347, 507, 605, 630, 635, 700, 712, 716, 809, 811, 812, 845, and HFS 46.

5. Plain Language Analysis

Chapter NR 149 sets requirements for the certification and registration of laboratories that submit data to the department for covered programs. Since the last major revision of the chapter, laboratory operations have undergone significant advances. Other state and national certification programs have promulgated and revised rules that reflect these advances. This version of ch. NR 149 incorporates many of those changes and, where appropriate, moderates them by incorporating suggestions expressed by our regulated community.

The proposed rule introduces efficiencies for administering the certification and registration program, improves the structure used for certification and registration of laboratories, identifies clear steps and procedures for the certification and registration process, establishes a more equitable fee structure, clarifies requirements for proficiency testing of laboratories, stipulates procedures for on-site evaluations of laboratories, and adds specificity and flexibility to quality systems requirements for laboratories.

6. Summary of, and Comparison with, Existing or Proposed Federal Regulations

The US EPA has established a program for the certification of laboratories that analyze drinking water for compliance with the safe drinking water act. The US EPA delegates the authority to certify laboratories to

states that have established equivalent programs. The proposed rule incorporates the latest changes in the regulations and manual used by EPA to certify drinking water laboratories. Thus this revision makes the Wisconsin certification and registration program current with the US EPA's.

The US EPA sponsors a National Environmental Laboratory Accreditation Program (NELAP) for states that voluntarily seek such recognition. The procedures for accrediting laboratories under NELAP are contained in standards promulgated by the National Environmental Laboratory Accreditation Conference (NELAC). The proposed rule contains elements of the NELAC Standards recommended for incorporation by our regulated community. In most cases, the incorporated elements address standard practices commonly performed by laboratories.

7. Comparison with Rules in Adjacent States

All of the adjacent states, Minnesota, Illinois, Michigan, and Iowa, have primacy from the US EPA to certify laboratories analyzing drinking water. Their rules must mirror federal requirements to maintain the states' authority. Our proposed revision makes the drinking water portion of our chapter current with those of the adjacent states.

As is the case in Wisconsin, Minnesota, Iowa, and Illinois have certification, registration, or accreditation programs for laboratories analyzing wastewater, hazardous waste, and solid waste. Minnesota is currently revising its certification rule to incorporate requirements that are very similar to the ones the department is proposing under this revision. Illinois is a recognized NELAP accrediting authority and its rules agree or are stricter than those the department proposes for ch. NR 149. Iowa has a certification program that is more limited in scope than ours because the state has few laboratories providing environmental analytical services other than the University of Iowa State Hygienic Laboratory.

8. Summary of Factual Data and Analytical Methodologies

To create this proposed rule, the Department engaged in a structured process to seek input from all stakeholders. The core of this effort consisted in convening a rule revision advisory committee (RAC) composed of all the members of the Certification Standards Review Council, a body authorized by s. 15.107 (1), Stats., and additional experts nominated by organizations involved with or affected by environmental laboratories. The following constituencies were represented in the NR 149 RAC:

- Small and Large Municipal Wastewater Treatment Plants
- Commercial Laboratories
- Industrial Laboratories
- Public Water Utilities
- Wisconsin Paper Council
- Wisconsin Department of Agriculture Trade and Consumer Protection (WDATCP)
- Wisconsin Environmental Laboratories Association (WELA)
- Municipal Environmental Group (MEG)
- Wisconsin State Laboratory of Hygiene
- Non-laboratory Data Users
- Environmental Data Evaluation Consultants
- Laboratory Certification and Registration Program

The NR 149 RAC envisioned a code that had greater specificity without sacrificing flexibility and alternatives for compliance. Over the course of 16 meetings held from January 2002 to November 2003, the NR 149 RAC offered advice and guidance on every aspect of the Certification and Registration Program. Meetings were facilitated by program staff. The agreements reached were captured in standardized documents reviewed and endorsed by the NR 149 RAC. These documents were used in drafting specific language included in the proposed rule.

The NR 149 RAC reviewed a complete draft of the proposed chapter in August 2004. The comments received during this meeting, and the input received by the Certification and Registration Program and other Department programs are reflected in this proposed rule.

The following table illustrates the methodologies and data considered in producing this proposed rule:

Methodology	**Data Considered**
Advisory Committee	Input from all stakeholders on all aspects of the Laboratory Certification and Registration Program.
NR 149 RAC Questionnaire	Answers to graded scale of opposites completed by NR 149 RAC to determine focus, form, and general content areas of proposed rule.
Decision Making Rule	NR 149 RAC made decisions by reaching substantial agreement and when necessary, registering consensus on a gradient scale.
Topic Prompters	Captured decisions made by NR 149 RAC on program administration, program structure, certification and registration process, proficiency testing, and on-site laboratory evaluations.
Model Documents	Alternatives for certification and registration structure, fee structure, applications, and quality systems.
Comparative Analysis	Scope of certification and registration of current laboratories in the program to arrive at equitable fee structure. Analytical technologies for relative difficulty and to arrive at fees to be assessed. Fee structure and assessments of certification programs in other states.
Feasibility and Legal Review	Certification and covered program staff reviewed changes endorsed by RAC to determine feasibility of implementation. Legal counsel reviewed draft rule for defensibility.

9. Analysis and Supporting Documents Used to Determine Effect on Small Business or in Preparation of Economic Impact Report

The Department sought information from small commercial laboratories to complete the small business analysis. The Department selected seven representative small laboratories that were current participants of the Laboratory Certification and Registration Program. The laboratories selected span the state's geography and represent all the analytical disciplines offered by small commercial laboratories in the certification and registration program, including analyses for drinking water, spill and remediation investigations, municipal wastewater treatment plants, and whole effluent toxicity.

During the first phase of the small business analysis, the selected laboratories received documents detailing the expected scope of their certifications under the proposed rule, translating the certifications that the laboratories currently held into the proposed new structure. The purpose of this phase was to determine whether small businesses could accommodate all their certification needs under the new structure and to explore whether small businesses would be likely to drop certifications based on perceived increased costs.

During the second phase of the small business analysis, the Department analyzed the proposed rule and identified requirements in it, other than those related to the proposed certification and registration structure, that were different from the current requirements of ch. NR 149 and that might affect the operating costs of small laboratories. The selected seven small laboratories were asked to complete a survey aimed at evaluating the economic significance of the proposed changes.

The Department received six responses for the phase I analysis and five for the second phase. One of the phase II laboratories that did not complete the survey responded that the laboratory was bound by Federal standards, since the laboratory only performed drinking water analyses. The Department believes that although only five laboratories (71%) responded to the phase II survey, the resulting data can be safely extrapolated to many other small laboratories participating in the program.

The survey used during phase II of the small business analysis is included in attachment B.

10. Effect on Small Business

Small business laboratories in general feel comfortable in being able to meet the requirements highlighted in the phase survey II from the proposed rule. The Department believes that the survey findings substantiate the perception that most laboratories have already been performing many of the requirements newly incorporated in the rule.

Small business laboratories are not likely to change their scope of certification under the proposed certification structure, as long as the costs for maintaining those certifications do not increase dramatically. The proposed rule maintains these costs as in check. Projected increases in certification fees assessed to laboratories are likely to remain stable for most small laboratories and will increase by no more than 10% in a few cases.

When given options for quality control analyses that could reduce operation costs, laboratories are selective and respond that cost is not the sole determinant in selecting an option. Some small businesses are likely to continue to choose existing more costly practices and may need to be educated in selecting valid and more economical alternatives.

Most operating costs in laboratories are associated with maintaining staff to perform analyses. The proposed rule does not require increases in staff to ensure compliance with it.

The Department has accommodated the fiscal impact on small businesses performing limited tests in the drinking water matrix by grouping tests under a preferential fee assessment tier.

The Department concludes that the proposed rule provides flexibility in meeting many of its requirements. Small businesses may be able to realize some savings in implementing the proposed rule by judiciously selecting among the options contained in it. The proposed rule came to light after considering significant input from regulated small laboratories. The specificity and flexibility contained in the proposed rule bring equity and uniformity to all laboratory operations and are likely to increase the competitiveness of small laboratories providing analytical services in and out of state.

11. Anticipated Costs Incurred by Private Sector

The anticipated costs to be incurred by the private sector are not significantly different from the additional costs anticipated for small businesses, which as shown in the previous section are relatively small and can be moderated by choosing more economical alternatives allowed within the proposed rule. The Department has data suggesting that for larger commercial and industrial laboratories, the savings afforded by the flexibility in the proposed rule will represent a larger percentage of their quality systems costs. The economies of scale in large private laboratories will tend to reduce adverse economic impacts.

12. Agency Contact Person

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13. Place Where Comments Are to Be Submitted and Deadline for Submission

Same as above.

SECTION 1. Chapter NR 149 is repealed and recreated to read:

LABORATORY CERTIFICATION AND REGISTRATION

SUBCHAPTER I
GENERAL PROVISIONS

NR 149.01 Purpose. The purpose of this chapter is to establish a program for the certification and registration of laboratories performing testing under s. 299.11, Stats.

NR 149.02 Applicability. (1) This chapter specifies requirements for the administration by the department of the laboratory certification and registration program.

(2) Unless otherwise exempted in this section, this chapter applies to laboratories:

(a) Applying for certification and registration.

(b) Holding a certification or a registration.

(c) Submitting data to the department for a covered program.

(d) Generating data that is necessary for the department to determine compliance with a covered program.

Note: Administrative codes and programs requiring analyses to be performed by a certified or registered laboratory are chs. NR 110 – Sewerage Systems, 113 – Servicing Septic Systems, 123 – Well Compensation Program, 131 – Metallic Mineral Prospecting, 132 – Metallic Mineral Mining, 140 – Groundwater Quality, 145 – Private Wells, 150 – Environmental Analysis and Review Procedures, 157 – Management of PCBs, 158 – Hazardous Substance Discharge Notification, 182 – Metallic Mining Waste, 206 – Land Disposal of Municipal and Domestic Wastewaters, 210 – Sewage Treatment Works, 211 – General Pretreatment Requirements, 212 – Wasteload Allocated Effluent Limits, 214 – Land Treatment of Industrial Liquid Wastes, 216 – Stormwater Management, 219 – Analytical Test Methods and Procedures, 347 – Sediment Sampling and Analysis, 507 – Environmental Monitoring for Landfills, 605 – Identification of Hazardous Waste, 630 – Storage, Treatment, and Disposal Facilities, 635 – Groundwater Leachate Monitoring, 700 – General Requirements for Investigation and Remediation of Environmental Contamination, 712 – Environmental Response Actions, 716 –Site Investigations, 809 – Safe Drinking Water, 811 – Design of Community Water Supplies, 845 – County Administration of NR 812 (Private Wells), and HFS 46 – Group Day Care Centers for Children.

(3) When the terms laboratory or laboratories are used unmodified in the rest of this chapter, the terms include laboratories certified or registered under this chapter and those seeking certification or registration under this chapter.

(4) The requirements for the certification of laboratories performing analyses for the safe drinking water program covered by ch. NR 809 are specified in s. NR 149.19.

Note: Laboratories performing analyses for the safe drinking water program covered by ch. NR 809 must be certified even if they do not perform or intend to perform tests commercially for hire. Registration is not available for these analyses.

(5) The requirements for the certification and registration of laboratories performing whole effluent toxicity testing are specified in ss. NR 149.20 and 149.49.

(6) This chapter applies to laboratories analyzing industrial pre-treatment samples when the department is the control authority of a pre-treatment ordinance, or when another control authority requires it.

(7) This chapter does not apply to laboratories performing bacteriological and radiological analyses for a covered program.

(a) Laboratories shall be certified or approved under ch. ATCP 77 by the department of agriculture, trade, and consumer protection to perform bacteriological testing for a covered program.

(b) Laboratories shall be certified or approved by EPA to perform radiological testing for a covered program.

(8) This chapter establishes requirements that shall be followed, at a minimum, by all laboratories.

(a) Laboratories are also responsible for following any requirements pertaining to analyses and analytical operations contained in mandated test methods or regulations when those requirements are more stringent than the ones specified in this chapter, unless this chapter grants explicit, alternative allowances.

(b) When it is not apparent whether the minimum requirements of this chapter or those specified in mandated test methods or regulations are more stringent, laboratories shall follow the requirements in mandated test methods or regulations.

(c) The department shall retain the authority to make a decision on the stringency of a laboratory requirement when the applicability of a requirement is disputed.

Note: The order of precedence for the authority of a requirement is statute, code and method. The order of applicability of a requirement is generally method, code and statute, whenever each succeeding source contains more general or less stringent requirements that are not in conflict.

NR 149.03 Definitions. In this chapter:

(1) "Acceptance limits" means limits established by the department that are used to determine if a laboratory has analyzed a proficiency testing sample successfully.

(2) "Accuracy" means the closeness of a measured value to an accepted reference value or standard.

(3) "Analysis day" means the day in which a specific type of analysis is performed.

(4) "Analyte" means the chemical substance, physical property or organism assayed in a sample.

(5) "Analyte group" means a set of analytes that can be determined using the same method or technique and that constitute a unit, acknowledged by the department, of the third tier of certification or registration.

(6) "Analytical balance" means a balance that is capable of measuring masses to at least 4 decimal places.

(7) "Analytical batch" means a set of any number of prepared samples, such as extracts, digestates or concentrates, or samples requiring no preparatory steps analyzed together as a group in an uninterrupted sequence, and may consist of samples of various quality system matrices.

(8) "Analytical class" means a set of analytes or analyte groups of similar behavior or composition, or a set of analytes or analyte groups regulated under the same provisions of the federal safe drinking water act, that is used to organize the third tier of certification or registration.

(9) "Analytical instruments" means any test instrument used to provide analytical results that is not support equipment.

(10) "Analytical run" means an event consisting of the uninterrupted analysis of a set of samples used to establish the frequency of continuing calibration verification.

(11) "Analytical staff" means, but is not limited to, laboratory directors, supervisory personnel, quality assurance personnel, technicians, chemists, biologists, extractionists and analysts.

(12) "Authoritative source" means a publication, text or reference included in Appendix III.

(13) "Aqueous" means a certification or registration matrix designating any aqueous sample that is not a drinking water, and samples with no more than 15% settleable solids.

Note: Samples with more than 10% settleable solids may also be classified as solid.

(14) "Batch" means a set of samples prepared or analyzed together under the same process, instrumentation, personnel and lots of reagents.

(15) "Bias" means the consistent deviation of measured values from a true value caused by systematic errors in a procedure or a measurement process.

(16) "Calibration" means the process used to establish an empirical relationship between the response of an analytical instrument and a known amount of analyte, or the process used to determine, by measuring or comparison with a reference standard, the correct value of each scale reading in an instrument, meter or measuring device.

(17) "Calibration blank" means a sample devoid of target analytes used to establish the analytical zero of a calibration function.

(18) "Calibration function" means the specific mathematical relationship resulting from the application of an algorithm or reduction technique to calibration standards and their responses.

(19) "Certificate" means a document owned by the department and issued to a laboratory that indicates the fields of certification or registration granted to a laboratory.

(20) "Certification" means the recognition extended by the department to laboratories that perform analyses for hire in connection with a covered program requiring certification or registration, or to laboratories that perform drinking water analyses.

(21) "Certification matrix" means a matrix type that is part of the first tier of a field of certification. Certification matrices are drinking water, aqueous and solids.

(22) "Certified laboratory" means a laboratory that has been granted certification by the department directly or through reciprocal recognition under this chapter.

(23) "Coefficient of determination" means a quantity that measures the degree of concordance between the points in a calibration curve and the quadratic function derived to connect them.

(24) "Commercially for hire" means offering analyses for remuneration or non-monetary compensation generally available to any party requesting analytical services.

(25) "Confirm" means to verify the identity of a compound by an alternative procedure, column, detector, wavelength, or by a technique that bases detection on a different scientific principle from the one originally identifying the compound.

(26) "Control" means to possess, directly or indirectly, the power to direct or cause the direction of the management and policies of an entity, whether that power is exercised through one or more intermediary entities, or alone, or in conjunction with, or by an agreement with, any other entity, and whether that power is established through a majority or minority ownership or voting of securities, common directors, officers, stockholders, voting trusts, holding trusts, affiliated companies, or documented agreements between government entities, whether statewide, countywide, citywide or any combination thereof.

(27) "Control authority" means to have direct or delegated responsibility for establishing, implementing, or monitoring an industrial waste pre-treatment program.

(28) "Correlation coefficient" means a quantity that measures the degree of concordance between the points in a calibration curve and the linear function derived to connect them.

(29) "Corrective action" means any measure taken to eliminate or prevent the recurrence of the causes of an existing nonconformity, defect or undesirable condition.

(30) "Council" means the certification standards review council created under s. 15.107(11), Stats.

(31) "Covered program" means a program defined by s. 299.11(1) (d), Stats., and includes any department program, project, permit, contract or site investigation that requires analytical work to be performed by a certified or registered laboratory.

Note: Consult the note in s. NR 149.02(2) (d) for a list of department administrative rules of programs requiring certification or registration under this chapter.

(32) "Deficiency" means a documented or verifiable deviation from this chapter that is noted during an on-site evaluation or while reviewing analytical data produced by a laboratory.

(33) "Department" means the department of natural resources.

(34) "EPA" means the United States environmental protection agency.

(35) "Evidentiary chain of custody" means documentation verifying the possession of an analytical sample from its collection time to its receipt in the laboratory, through all handling and analyses steps, to its final disposition.

(36) "Field of certification" means a unit by which the department grants or recognizes certification to a laboratory. There are 2 types of fields of certification, each consisting of 3 tiers: matrix-analytical technique-analyte or analyte group, and matrix-method-analyte or analyte group.

(37) "Field of registration" means a unit by which the department grants or recognizes registration. Each field of registration consists of 3 tiers: matrix-analytical technique-analyte or analyte group.

(38) "Inert matrix" means a quality control matrix either devoid of the analytes that will be assayed in an analytical test, or containing the analytes that will be assayed at a constant concentration that does not affect the evaluation of the degree of control of an analytical test. Typical inert matrices are distilled water, deionized water, diatomaceous earth and Ottawa sand.

(39) "Internal standard" means an analyte added to calibration standards, blanks, quality control and analytical samples as a reference for evaluating and controlling the precision and bias of an analytical test. Responses of internal standards are used to adjust the quantities of analytes reported in tests that employ such standards.

(40) "Known quality control sample" means a sample or standard of known and certified concentration originating from a source outside the laboratory.

(41) "Laboratory" means a facility that performs tests in connection with a program which requires data from a certified or registered laboratory. A facility consisting of a principal laboratory and annexes within 5 miles of the principal laboratory may be considered a single laboratory at the discretion of the department.

(42) "Laboratory control sample" means a sample of an inert matrix or a matrix with a consistent concentration of the analytes of interest, fortified with a verified known amount of the analytes of interest, generally used to assess the performance of all or part of a measurement system, or to establish intra-laboratory or analyst bias.

(43) "Laboratory equipment" means any support equipment or analytical instrument necessary to or involved in generating the results of an analysis.

(44) "Limit of detection" means the lowest concentration or amount of analyte that can be identified, measured and reported with confidence that the concentration is not a false positive value.

(45) "Limit of quantitation" means the lowest concentration or amount of an analyte for which quantitative results can be obtained with a specified degree of confidence for a given limit of detection.

(46) "MCL" means maximum contaminant level and is the maximum permissible level of a contaminant in water which is delivered to any user of a public water system.

(47) "Matrix spike" means a sample prepared by adding a known level, concentration, mass or quantity of analyte to a specified amount of matrix for which an independent estimate of the assayed analyte concentration, mass or quantity is available, and generally used to determine the effect of a matrix on a method's recovery efficiency.

(48) "Matrix spike duplicate" means a replicate matrix spike prepared and processed in the laboratory in the same manner as its corresponding matrix spike, and generally used to determine the precision of the recovery of an analyte.

(49) "Method blank" means a sample of a matrix devoid of or having a consistent concentration or amount of the analytes of interest processed simultaneously with and under the same conditions, preparatory and analyses steps as the associated samples.

(50) "Method detection limit" or "MDL" means the minimum concentration of an analyte that can be measured and reported with 99% confidence that the stated concentration is greater than zero, determined from analyses of a set of samples containing the analyte in a given matrix. The method detection limit is generated according to the protocol specified in 40 CFR 136, Appendix B.

(51) "Nonconformance" means a documented or verifiable deviation from the requirements of this chapter.

(52) "On-site evaluation" means an assessment conducted by the department at a laboratory seeking or maintaining certifications or registrations to determine actual or potential compliance with the requirements of this chapter.

(53) "Ownership" means owning or controlling, directly or indirectly, a laboratory facility through an equity interest or its equivalent of 10% or more.

(54) "Pesticide" means a chemical substance defined in s. 94.67 (25) and (36), Stats., an isomer of a pesticide or a degradation product or metabolic product of a pesticide.

(55) "Precision" means the degree to which a set of observations or measurements of the same property obtained under similar conditions conform to themselves. Precision is usually expressed as standard deviation, variance or range, in absolute or relative terms.

(56) "Preparation batch" means a batch of up to 20 samples, excluding quality control samples, of the same quality system matrix processed in a 24-hour period from the start of the processing of the first sample to the start of the processing of the last sample. A preparation batch may consist of up to 7 samples, excluding quality control samples, processed during the course of no more than a week in laboratories that do not analyze more than 7 samples for a given test and quality system matrix per week.

(57) "Proficiency testing sample" means a sample, with a composition or concentration unknown to the laboratory that is used to evaluate whether the laboratory can produce analytical results within specified acceptance criteria.

Note: Proficiency testing samples are also known as performance evaluation samples or reference samples.

(58) "Qualify" means placing a written statement accompanying or referencing test results identifying anomalies or departures from this chapter encountered in generating the results.

(59) "Quality assurance" means an integrated system of activities involving planning, control, assessment, reporting and improvement to ensure that a product or service meets defined standards of quality with a stated level of confidence.

(60) "Quality control" means the overall system of technical activities designed to measure and control the quality of a product or service that meets the stated needs of users.

(61) "Quality control limit" means the acceptance criteria published by the department, referenced in an approved method, or calculated by a laboratory for quality control samples.

(62) "Quality system matrix" means a type of sample classification used for establishing quality control acceptance criteria. Quality system matrices include, but are not limited to, drinking water, wastewater influent, wastewater effluent, groundwater, leaching procedure extracts, soils, oils, chemical wastes and biosolids.

(63) "Quality system" means a structured and documented management arrangement describing the policies, objectives, principles, organizational authority, responsibilities, accountability and implementation plan of an organization for ensuring quality in its work processes, products and services.

(64) "Raw data" means any original factual information from a measurement activity or study recorded in media that allows the reconstruction and evaluation of the activity or study. Raw data include, but are not limited to, absorbance, emission counts, area counts, peak heights, abundance and millivolts. Raw data may be stored in hard copy or electronically.

(65) "Reagent grade water" means water which has been treated to remove any impurities that may affect the quality of an analysis.

(66) "Received on ice" means a designation to indicate that sample containers arriving at a laboratory have been received surrounded by an ice slurry, crushed, cubed or chipped ice.

(67) "Reference material" means a material that has one or more sufficiently well established properties that can be used for calibrating or verifying the calibration of support equipment or analytical instruments.

(68) "Reference standard" means a standard, generally of the highest metrological quality available, from which measurements made at a laboratory are derived.

(69) "Registration" means the recognition extended by the department to a laboratory that submits data in connection with a covered program requiring certification or registration that does not perform analyses for hire and that does not perform drinking water analyses.

(70) "Registration matrix" means a matrix type that is part of the first tier of a field of registration. Registration matrices are aqueous and solids.

(71) "Registered laboratory" means a laboratory that has been granted registration by the department directly or through reciprocal recognition under this chapter. A registered laboratory may be a captive industrial laboratory that performs tests solely on its own behalf or that of a subsidiary under common ownership or control, a municipal laboratory owned by a single municipality, or a municipal laboratory owned by more than one municipality that only performs tests for the owning municipalities.

(72) "Relocation" means a move by a laboratory that results in a change in the laboratory's facility identification number.

(73) "Replicate" means aliquots analyzed identically but independently that are obtained from the same sample container.

(74) "Reporting limit" means a concentration or amount of analyte required by the department or client above which numerical results must be reported. Reporting limits may be limits of detection, limits of quantitation, quantitation limits or other concentrations, and may be specific to a project or investigation.

(75) "Revocation" means cancellation of a laboratory's certification or registration.

(76) "Results" means the quantitative or qualitative output of an analysis, including, but not limited to, measurements, determinations and information obtained or derived from tests.

(77) "Sample standard deviation" means the standard deviation calculated for a set of samples belonging to a larger population. The sample standard deviation formula contains the quantity "n - 1" in the denominator inside the radical, where n equals the number of samples.

(78) "Second source standard" means a standard procured from a supplier or manufacturer different from the supplier or manufacturer of a laboratory's calibration standards, or a standard obtained from the same supplier or manufacturer of a laboratory's calibration standards from a lot verifiably different from the lot of the calibration standards.

(79) "Sensitivity" means the capability of a method or instrument to discriminate between measurement responses representing different levels of analyte, or the capability of a method or instrument to detect an analyte at or above a stated quantity.

(80) "Signature" means the name of a person written by that person, or a distinctive mark or characteristic indicating the identity of that person. Signatures can be provided in hard copy or electronically.

(81) "Solid" means a certification or registration matrix designating samples such as soils, sediments, sludges, organic liquids, oils or aqueous products and by-products of industrial processes, and aqueous samples with more that 10% settleable solids.

Note: Samples containing more than 10% but less than 15% settleable solids may also be classified as aqueous.

(82) "Subcontract" means the act of sending a sample or a portion of a sample by a certified laboratory to another certified laboratory.

(83) "Support equipment" means devices that may not be analytical instruments, but that are necessary to support laboratory tests and operations. These devices include, but are not limited to, autoclaves, balances, ovens, refrigerators, freezers, incubators, water baths, temperature measuring devices, sample preparation devices and volumetric dispensing devices when quantitative results depend on the accuracy of the support equipment.

(84) "Surrogate" means a substance with properties that mimic an analyte of interest unlikely to be found in environmental samples that is used to evaluate the bias of an analysis in the fortified sample.

(85) "Suspension" means a temporary cancellation of a laboratory's certification which may not require an on-site evaluation for reinstatement.

(86) "Test" means any chemical, biological, physical, radiological or microscopic assay, examination or analysis conducted by a laboratory on water, wastewater, groundwater, biosolid, waste material, hazardous substance or any other matrix analyzed to determine compliance with a covered program.

(87) "Temperature blank" means a sample container of at least 40 ml filled with water and transported with each shipment of collected samples to determine the temperature of other samples in the shipment on arrival at a laboratory.

(88) "Traceability of measurement" means the ability of relating a result or measurement to appropriate state, national or international standards through an unbroken chain of documented comparisons.

(89) "Unfamiliar sample" means a sample for which a laboratory has either no information or questionable information from previous characterizations of samples from the same source, or a sample for which there is no information about the process generating it.

(90) "Ultra-low level metals" means concentrations of metals at sub-microgram per liter or sub-microgram per kilogram concentrations and those requiring to be determined in clean room environments.

(91) "Waste characteristic extractions" means extractions, such as the toxicity characteristic leaching procedure, performed on any solid or waste to establish whether it exhibits a defined regulatory characteristic.

(92) "Waste characterization assays" means determinative tests, such as pensky-martens closed cup ignitability, corrosivity of liquids, and polychlorinated biphenyls screening of organic liquids, performed on any solid or waste to evaluate whether it exhibits a defined regulatory characteristic.

NR 149.04 Disclaimers. A laboratory may not claim or imply that data it generates has department approval solely on the basis of the laboratory's certification and registration status.

Note: Certification or registration of a laboratory is not an endorsement by the department of the quality or validity of the data generated by a laboratory. Certification or registration does not guarantee the usability of data generated by a laboratory for an intended purpose. The covered programs under this chapter are the ultimate users of laboratory results and determine whether they accept or reject analytical data from any certified or registered laboratory.

SUBCHAPTER II
PROGRAM ADMINISTRATION

NR 149.05 Required certification or registration. (1) All laboratories submitting data to the department for a covered program or generating data to determine compliance with a covered program shall be certified or registered under this chapter for the fields of certification or registration corresponding to the submitted or generated data, unless this chapter or a covered program exempts a test from requiring certification or registration.

(2) The department may not accept data required to be generated or submitted by a certified or registered laboratory from a laboratory that is not certified or registered under this chapter except as provided in s. NR 149.11.

NR 149.06 Certificates. (1) The department shall issue certificates to certified and registered laboratories indicating or making reference to the specific fields of certification or registration for which laboratories have been granted certification or registration. The department shall issue certificates annually and whenever the fields for which a laboratory is certified or registered change, and when a laboratory relocates, or changes its name.

(2) The department shall issue certificates to the owner or legally responsible party of a laboratory.

(a) The department may not issue certificates to an operating contractor of a laboratory who is not the owner or legally responsible party of a laboratory.

(b) The department may indicate in a certificate that a laboratory is managed by an outside contractor.

(3) Certificates are the property of the department and shall be returned to the department upon request.

(4) Laboratories may not alter or modify certificates issued by the department. Laboratories that alter or modify a certificate, or that misrepresent the fields of certification or registration contained or referenced in a certificate may be subject to revocation of their entire certifications or registrations.

(5) Certificates shall be displayed conspicuously at the facilities of the laboratories to which they have been issued.

NR 149.07 Transfer of certification and registration. (1) Laboratory certifications and registrations may not be transferable to other entities unless the department expressly approves the transfer. The department shall have procedures for evaluating the eligibility of a laboratory for transferring its certifications and registrations by application.

(2) Laboratories shall notify the department of any change of ownership as soon as practicable, but no later than 30 days after a change has occurred. As part of the notification, the laboratory shall provide the department the number of analytical staff working or expected to be working at the facility 30 days before and after the ownership change.

(3) The department shall inform the laboratory within 30 days after the receipt of the notification or the actual transfer of ownership, whichever happens later, whether the laboratory is eligible for having existing certifications or registrations transferred by application, or whether an initial application is required to be submitted by the new laboratory owner.

(a) The laboratory shall submit the type of application the department has determined is appropriate within 30 days after the date of the determination notification.

(b) All certifications and registrations granted to the laboratory changing ownership shall expire 30 days after the department notifies the laboratory of the type application required to be submitted.

Note: Requirements for initial and transfer applications are contained in s. NR 149.14.

NR 149.08 Recognition of other certifications, registrations, accreditations, licenses or approvals. (1) AGRICULTURE, TRADE AND CONSUMER PROTECTION AGREEMENT. The department shall recognize the certification, registration, accreditation, licensure or approval by the department of agriculture, trade and consumer protection for microbiological testing performed by a laboratory submitting or generating data for a covered program.

(2) EPA AGREEMENT. The department shall recognize the certification, registration, licensure or approval by EPA for radiological testing performed by a laboratory submitting or generating data for a covered program.

(3) LABORATORIES CERTIFIED, REGISTERED, ACCREDITED, LICENSED OR APPROVED BY OTHER GOVERMENTS. (a) The department shall negotiate with and attempt to enter into agreements with federal agencies and agencies of other states to reciprocally recognize laboratories under this chapter.

(b) The department may recognize the certification, registration, accreditation, licensure or approval of a laboratory by another state or an agency of the federal government if the standards used for the qualification of a laboratory are substantially equivalent to those established in this chapter. The department shall establish procedures to determine equivalency.

(c) The department may not recognize the certification, registration, accreditation, licensure or approval of a laboratory by another state or an agency of the federal government, unless that state or federal agency recognizes laboratories under this chapter.

(d) The department shall publish periodically a list of those states and federal agencies whose certifications, registrations, accreditations, licensures or approvals it accepts.

(4) PRIVATE ORGANIZATION AGREEMENTS. (a) The department may negotiate with and attempt to enter into agreements with private not for profit organizations to recognize laboratories under this chapter.

(b) The department may recognize the certification, registration, accreditation, licensure or approval of a laboratory by a private not for profit organization if the organization's standards used for the qualification of a laboratory are substantially equivalent to those established in this chapter. The department shall establish

procedures for determining equivalency if the department attempts to enter into a recognition agreement with a private not for profit organization.

(c) The department shall publish periodically a list of those private not for profit organizations whose certifications, registrations, accreditations, licensures or approvals it accepts.

NR 149.09 Certification standards review council. (1) The council shall advise the department on the standards used to certify, register, suspend and revoke laboratories.

(2) The council shall advise the department on training and outreach activities the department may offer or sponsor to facilitate compliance of laboratories with this chapter.

(3) The department shall prepare annually all of the following for review by the council:

(a) A summary of laboratory evaluations performed. The council shall advise the department on the frequency and scope of evaluations necessary to determine compliance of laboratories with this chapter.

(b) A list of required proficiency testing samples and available sample providers. The department shall seek the advice of the council before requiring the analysis of additional proficiency testing samples and approving sample providers.

(c) A summary of fees scheduled to be assessed to laboratories. The department shall seek the advice of the council before implementing changes in the fees assessed to laboratories.

(d) A summary of variances issued. The department shall seek the advice of the council in granting variances.

NR 149.10 Enforcement. (1) ADMINISTRATIVE PROCEDURES. A laboratory's certification or registration is valid until it expires, is suspended or revoked. If, after opportunity for a contested case hearing, the department finds that a laboratory materially and consistently failed to comply with the provisions of this chapter, the department may suspend or revoke a laboratory's certification or registration in whole or in part by matrix, analytical technique, analyte or analyte group. Contested case hearings for out-of-state laboratories regulated by this chapter shall be held in Madison, Wisconsin.

Note: The department follows a stepped enforcement process that failing resolution at a lower stage may culminate in an order of suspension, revocation or referral to the attorney general's office. Typical early steps in the enforcement process involve issuing notices of noncompliance and violation, but the department may skip any step in the process depending on the severity of a nonconformance and the urgency for correcting it.

(a) *Causes for suspension.* Causes for suspension include any of the following:

1. Failure to comply with the quality program requirements as specified in subch. VII.

2. Reporting data to the department after a laboratory is deemed temporarily incapable of performing analysis in any matrix, analytical technique or method, analyte or analyte group.

3. Suspension of certification, registration, accreditation, license or approval by another state or agency of the federal government for which the laboratory holds certification if the grounds for suspension are substantially equivalent to any of those listed in this subsection.

(b) *Causes for revocation.* Causes for revocation include any of the following:

1. Failure to maintain records as required in this chapter.

2. Failure to maintain the certifications or registrations necessary to submit data to the department as identified in s. NR 149.05.

3. Failure to allow the department to perform on-site evaluations as specified in subch. VI.

4. Failure to comply with the quality program requirements as specified in subch. VII.

5. Failure to notify the department of any change of ownership as specified in s. NR 149.07.

6. Failure to submit requested records to the department.

7. Failure to follow approved methods.

8. Falsification of analytical results, testing dates or any other information submitted to the department by the laboratory.

9. Alteration or modification of a certificate or misrepresentation of fields of certification or registration contained or referenced in a certificate.

10. Sending a proficiency testing sample, or portion of a proficiency testing sample to another laboratory for analysis.

11. Knowingly analyzing a proficiency testing sample, or portion of a proficiency testing sample from another laboratory.

12. Submitting proficiency testing reports that have been altered by the laboratory.

13. Failure of 2 consecutive proficiency testing samples for any method/analyte or analyte group combination for laboratories holding certification in the drinking water matrix.

14. Demonstrated incompetence manifested by the chronic inability to meet the requirements of this chapter.

15. Revocation of certification, registration, accreditation, license or approval by another state or agency of the federal government for which the laboratory holds certification if the grounds for revocation are substantially equivalent to any of those listed in this subsection.

(c) *Procedure for suspension or revocation.* 1. An order suspending or revoking certification or registration shall be mailed to the laboratory and shall state the reasons for suspension or revocation. The order shall include the conditions under which reapplication will be accepted. For orders suspending certification or registration, the order may include a timetable for correcting the deficiencies that led to the suspension. For orders revoking certification or registration, the department may set a time period for the revocation.

2. An order suspending or revoking a certification or registration shall take effect on the thirtieth day after the order is mailed, unless the owner of a certified or registered laboratory submits a petition for a hearing to the department within 30 days. The petition for hearing shall specify the findings or conclusions, or both, which the laboratory disputes and conform to the requirements of s. NR 2.05 (5).

3. If a request for a hearing is submitted and meets the requirements of s. 227.42, Stats., the suspension or revocation shall be stayed and the department shall conduct a contested case hearing on the matter. At least 10 days prior to the date of the hearing, the department shall send a written notice to the laboratory indicating the date, time and location of the hearing. The final determination of the department, including the basis for the decision, shall be provided by written order to the laboratory after the hearing.

Note: Refer to ch. NR 2 for additional information on the contested hearing process.

4. The final determination of the department is subject to review under ch. 227, Stats.

(d) *Reapplication.* 1. A laboratory which has had its certification or registration suspended may reapply for certification or registration if all of the following are met:

a. The deficiencies that led to the suspension have been corrected in accordance with the timetable contained in the order.

b. Any conditions for reapplication specified in the order have been met.

2. A laboratory which has had its certification or registration revoked may reapply for certification or registration if all of the following are met:

a. The deficiencies that led to the revocation have been corrected.

b. Conditions contained in the order have been satisfied.

c. The time period for which the revocation is in effect has expired.

3. Laboratories reapplying for certification or registration following suspension or revocation shall submit an initial application as identified in s. NR 149.14 (1) and (2).

(2) REFERRAL. (a) Any violation of this chapter may be referred to the attorney general's office for enforcement under ss. 299.95 and 299.97, Stats.

(b) Any laboratory operating without proper certification or registration for which analysis results are submitted to the department for compliance monitoring or for analyses which require certification or registration under ch. NR 605 or 630, may be referred by the department to the attorney general's office for enforcement.

NR 149.11 Discretionary acceptance. (1) The department may accept, on a case-by-case basis, the results of tests originating in a laboratory not certified or registered for fields of certification or registration required by a covered program, if the results meet all other requirements of this chapter.

(2) The department may not accept the results of tests originating in a laboratory not certified or registered for the corresponding fields of certification or registration if the results do not meet all other requirements of this chapter.

(3) The department may not accept the results of tests originating in a laboratory not certified for the corresponding fields of certification for any tests associated with monitoring required under ch. NR 809.

(4) The department may charge a fee under s. 299.11(5) (d), Stats., if it is necessary to verify the results of tests for which a laboratory requests discretionary acceptance.

NR 149.12 Variances. (1) GENERAL. The department may approve variances from non-statutory requirements of this chapter when the department determines that the variances are essential to or have no effect on the department's objectives. Before granting variances, the department shall take into account factors such as good cause, circumstances beyond the control of the laboratory and financial hardship.

(2) REQUEST FOR VARIANCE. Requests for variances shall be submitted to the department's director of the bureau of integrated science services as far in advance as feasible. Each variance request shall contain:

(a) The name of the applicant or laboratory.

(b) The section of this chapter from which a variance is sought.

(c) A description of the circumstances under which the variance will be exercised, including any pertinent background information relevant to making a determination of justification.

(d) A statement as to whether the same or a similar variance has been requested previously, and if so, the circumstances of the previous request.

(3) APPROVAL OF VARIANCE. The department shall send a letter approving or denying the requested variance to the applicant within 60 days of receiving all the information referenced in sub. (2). If the request is denied, the letter shall state the reasons for the denial. A copy of all letters approving or denying variances shall be retained in the department's files.

SUBCHAPTER III
PROGRAM STRUCTURE

NR 149.13 Fields of certification and registration. (1) CERTIFICATION AND REGISTRATION UNIT. The department shall certify and register laboratories by specific fields of certification and registration. Fields of certification and registration consist of 3 tiers describing the analytical capability of laboratories.

(a) The first tier of certification or registration designates the matrices a laboratory may analyze.

(b) The second tier of certification or registration designates the analytical techniques or methods a laboratory may perform for a given matrix.

(c) The third tier of certification or registration designates the analytes or analyte groups a laboratory may analyze for a given matrix by a given analytical technique or method. Analyte and analyte groups are organized in classes.

(2) FIELDS OF CERTIFICATION TIERS. (a) The first tier of the certification fields shall consist of drinking water, aqueous and solids matrices.

(b) The second tier of the certification fields shall be method for the drinking water matrix and analytical technique for all other certification matrices.

(c) The third tier of the certification fields shall be analyte or analyte groups, when the department determines that offering analyte groups improves the efficiency of administering certifications.

(3) FIELDS OF REGISTRATION TIERS. (a) The first tier of the registration fields shall consist of aqueous and solids matrices.

(b) The second tier of the registration fields shall be analytical technique.

(c) The third tier of the registration fields shall be analyte or analyte group, when the department determines that offering analyte groups improves the efficiency of administering registrations.

(4) ANALYTICAL TECHNIQUES AVAILABLE FOR CERTIFICATION AND REGISTRATION IN AQUEOUS AND SOLID MATRICES. (a) Laboratories analyzing aqueous and solid samples may be certified or registered for the analytical techniques contained in Table 1.

(b) The department may offer certification or registration in other analytical techniques if they are approved by EPA or approved by the department as an emerging technology.

(c) Laboratories performing the following extraction techniques shall maintain a certification or registration for them:

1. Extraction procedure toxicity.

2. Synthetic precipitation leaching procedure.

3. Toxicity characteristic leaching procedure.

4. Shake extraction of solid waste with water.

(d) Except as noted in par. (c), the department shall include any associated sample preparation techniques, such as digestions, distillations, extractions, cleanups, concentration and dilution as part of the certification or registration for a given field of certification or registration.

(e) Waste characterization assays shall include tests required to determine if a material meets the hazardous definition in s. NR 605.04 and those used to fulfill the requirements of waste analysis plans under s. NR 630.13.

(f) Laboratories may employ multiple approved methods of analysis for a given analytical technique under the same field of certification or registration.

Table 1: Analytical Techniques for Aqueous and Solid Matrices

Number	Analytical Technique
1.	Colorimetric or Nephelometric
2.	Combustion or Oxidation
3.	Cold Vapor Atomic Absorption or Gaseous Hydride Spectrophotometry
4.	Electrometric Assays
5.	Flame Atomic Absorption Spectrophotometry
6.	Gas Chromatography
7.	Gas Chromatography-Mass Spectrometry
8.	Graphite Furnace Atomic Absorption Spectrophotometry
9.	Gravimetric Assays
10.	High Performance Liquid Chromatography
11.	High Resolution Gas Chromatography-High Resolution Mass Spectrometry
12.	High Resolution Gas Chromatography-Low Resolution Mass Spectrometry
13.	Inductively Coupled Plasma Emission Spectrophotometry
14.	Inductively Coupled Plasma-Mass Spectrometry
15.	Ion Chromatography
16.	Liquid Chromatography-Mass Spectrometry
17.	Polarography
18.	Titrimetric or Potentiometric Titration Assays
19.	Ultra-Low Level Metals Assays
20.	Voltammetry
21.	Waste Characteristic Extractions[1]
22.	Waste Characterization Assays[2]
23.	Whole Effluent Toxicity Assays
24.	Other[3]

1. Waste characteristic extractions are those referenced in s. NR 149.13 (4) (c). Laboratories shall also maintain certification or registration for any analyte to be determined in the resulting extract from any waste characteristic extraction.

2. Waste characterization assays are those referenced in s. NR 149.13 (4) (e).

3. See par. (b).

(5) METHODS AVAILABLE FOR CERTIFICATION IN THE DRINKING WATER MATRIX. (a) Methods available for the certification of laboratories analyzing drinking water are contained in ch. NR 809 and the "Manual for the Certification of Laboratories Analyzing Drinking Water", EPA815-R-05-004, fifth edition, EPA, Office of Groundwater and Drinking Water, January 2005.

(b) The department may certify laboratories to analyze drinking water using methods not contained in the sources cited in par. (a) if EPA has promulgated the methods or has granted approval for their use.

(6) CLASSES OF ANALYTES AND ANALYTE GROUPS AVAILABLE FOR CERTIFICATION AND REGISTRATION IN THE AQUEOUS AND SOLID MATRICES. (a) Laboratories analyzing aqueous and solid matrices may be certified or registered for analytes or analyte groups belonging to the analytical classes contained in Table 2 of this subchapter.

(b) Laboratories analyzing the aqueous matrix by the whole effluent toxicity assays technique may be certified or registered for analytes or analyte groups belonging to these analytical classes:

1. Acute whole effluent toxicity by species.

2. Chronic whole effluent toxicity by species.

(c) Laboratories analyzing the solids matrix by the waste characteristic extractions and waste characterization assays techniques may be certified or registered for analytes or analyte groups respectively belonging to the these analytical classes :

1. Extractables.

2. Waste characteristics.

Table 2: Classes of Analytes and Analytes Groups for Aqueous and Solid Matrices

Number	Class of Analyte or Analyte Group
1.	Demand
2.	Physical
3.	Nutrients
4.	Wet Chemistry
5.	Metals
6.	Base, Neutral, and Acid Extractable Semivolatile Compounds, including but not limited to: a. Aldehydes and Ketones b. Benzidines c. Chlorinated Hydrocarbons d. Explosive Residues e. Haloethers f. Nitroaromatics and Cyclic Ketones g. Nitrosamines h. Nonhalogenated Organics i. Phenols j. Phthalate Esters
7.	Pesticides and their metabolites, including, but not limited to: a. Acid Herbicides b. Nitrogen c. N-Methyl Carbamates and Substituted Ureas d. Organochlorine e. Organophosphorus f. Triazines g. Pesticides Not Otherwise Specified
8.	Petroleum Hydrocarbons
9.	Polychlorinated Biphenyls as Aroclors

10.	Polychlorinated Biphenyl Congeners
11.	Polychlorinated Dibenzo-p-Dioxins and Furans
12.	Polynuclear Aromatic Hydrocarbons
13.	Volatile Organic Compounds
14.	Other[1]

1. See sub. (8)(b).

(7) CLASSES OF ANALYTES AND ANALYTE GROUPS AVAILABLE FOR CERTIFICATION IN THE DRINKING WATER MATRIX. (a) The department may offer certification for any analyte or analyte group having a maximum contaminant level and for any analyte or analyte group regulated or monitored by the federal safe drinking water act.

(b) Laboratories analyzing drinking water may be certified for analytes or analyte groups belonging to the analytical classes contained in Table 3 of this subchapter.

Table 3: Classes of Analytes and Analyte Groups for the Drinking Water Matrix

Number	Class of Analyte or Analyte Group
1.	Disinfection Byproducts
2.	Primary Inorganic Contaminants
3.	Secondary Contaminants
4.	Synthetic Organic Contaminants
5.	Trihalomethanes
6.	Volatile Organic Compounds

(8) ANALYTES AND ANALYTE GROUPS AVAILABLE FOR CERTIFICATION AND REGISTRATION. (a) The analytes and analyte groups available for certification and registration are contained in Appendices I and II.

(b) The department may offer certification or registration for additional analytes or analyte groups that are not contained in Appendices I and II upon request by a covered program or when EPA requires their analysis, after consultation with the certification standards review council.

SUBCHAPTER IV
CERTIFICATION AND REGISTRATION PROCESS

NR 149.14 Application for certification or registration. (1) GENERAL REQUIREMENTS. (a) The certification and registration process requires laboratories to do all of the following:

1. Submit applications for seeking, renewing, revising or transferring certifications or registrations.

2. Declare the fields of certification or registration being sought, renewed, revised or transferred in corresponding applications.

3. Declare the methods of analysis that will be used to analyze analyte and analyte groups in the fields of certification or registration being sought, renewed, revised or transferred.

4. Submit a current analytical instrument list.

5. Submit acceptable results for proficiency testing samples when the department requires the analysis of the samples.

6. Submit a statement of intent to perform analyses for regulatory samples originating in Wisconsin for laboratories that are not physically located in the state of Wisconsin. Intent to perform analyses for regulatory samples originating in Wisconsin can be manifested by either:

a. Referencing the affiliation of the applicant laboratory with a plant, office, laboratory or engineering firm physically located in the state of Wisconsin.

b. Submitting a letter from a potential client requesting the applicant to perform analyses to determine compliance with a covered program.

7. Submit any information identified in an application for a specific field of certification or registration.

8. Allow the department to perform an on-site evaluation, when the department requires it or determines that an evaluation is necessary to determine potential or actual compliance with this chapter.

9. Submit any necessary fees required by this chapter.

10. Agree to comply with this chapter by signing a statement to that purpose in an application.

(b) Laboratories seeking, renewing, revising or transferring certifications or registrations shall declare their intent by completing forms provided by the department.

(c) The department may not accept applications for initial, renewed, revised or transfer of certifications or registrations from laboratories that meet any of the following:

1. Have been issued a notice of violation for nonconformance with this chapter when the nonconformance has not been corrected.

2. Have been issued an administrative order of suspension or revocation for violations of this chapter when the violations have not been corrected and the suspension or revocation period specified in an order has not elapsed.

3. Are not in compliance with this chapter at the time they voluntarily relinquish their certifications or registrations, the nonconformance existing prior to relinquishing their certifications or registrations has not been resolved, and at least 6 months have not elapsed since the voluntary action was undertaken.

(d) The department shall expire any application from laboratories that have not submitted all the information and materials required in an application within one year of the receipt of the application form.

(e) The department may require on a case-by-case basis the submittal with an application of additional information necessary to determine a laboratory's actual or potential compliance with the provisions of this chapter.

(2) INITIAL APPLICATIONS. (a) Laboratories seeking direct certifications or registrations by the department and that have never been certified or registered under this chapter, that have let all their certifications or registrations lapse or expire for more than one year, or that have voluntarily relinquished all their certifications or registrations shall submit initial applications to become certified or registered.

(b) Laboratories seeking certifications or registrations for additional matrices shall submit initial applications for the desired matrices.

(c) Laboratories seeking reinstatement of their certifications or registrations after a suspension or revocation shall submit initial applications for the desired certifications or registrations.

(d) Laboratories seeking to change their valid registrations into certifications shall submit initial applications to effect the conversion.

(e) Laboratories requesting that their certifications or registrations be transferred to a new owner that are ineligible for a transfer shall submit initial applications if they desire to maintain their certifications or registrations.

(3) REVISED APPLICATIONS. (a) Laboratories holding valid certifications or registrations shall submit revised applications to seek additional certifications or registrations in any of the following:

1. Techniques for a certified or registered matrix.

2. Analytes or analyte groups within a certified or registered analytical technique.

3. Methods for the drinking water matrix.

(b) Laboratories seeking re-instatement of their certifications or registrations within a year after failing to renew them shall submit revised applications for the desired certifications and registrations.

(c) Laboratories seeking to convert their valid certifications into registrations shall submit revised applications to effect the conversion.

(4) ANNUAL RENEWAL APPLICATIONS. (a) Laboratories holding valid certifications or registrations shall submit renewal applications annually to maintain their certifications or registrations.

(b) Laboratories may not use annual renewal applications to apply for additional certifications or registrations.

(c) Laboratories may use annual renewal applications to communicate changes in personnel, analytical methods within a certified or registered analytical technique for the aqueous and solid matrix, or laboratory equipment.

(5) APPLICATIONS FOR TRANSFER OF CERTIFICATIONS OR REGISTRATIONS. (a) When the department determines that the valid certifications or registrations of a laboratory are eligible to be transferred to a new owner, the laboratory shall submit an application for transfer of certifications or registrations.

(b) When the department determines that the valid certifications or registrations of a laboratory are not eligible to be transferred to a new owner, the laboratory shall submit an initial application to be eligible to retain its certifications or registrations.

(6) APPLICATIONS FOR CERTIFICATIONS OR REGISTRATIONS THROUGH RECIPROCAL AGREEMENT RECOGNITION. (a) Laboratories holding valid certifications, registrations, accreditations, licenses or approvals from government bodies or private organizations with which the department has established a reciprocal agreement may have their certifications, registrations, accreditations, licenses or approvals considered for recognition by the department by submitting reciprocity applications.

(b) Laboratories applying for recognition by the department under an existing reciprocal agreement shall submit certificates or official documents of their certifications, registrations, accreditations, licenses or approvals with their applications.

(c) Laboratories applying for recognition by the department under an existing reciprocal agreement shall agree to notify the department of any changes, within 30 days of their occurrence, in the laboratories' certification, registration, accreditation, licensure or approval status with the entity with which the department has the agreement.

(d) Laboratories applying for recognition by the department under an existing reciprocal agreement shall submit a copy of the report of the last on-site evaluation performed by the entity with which the department has the agreement.

(7) ISSUANCE OF CERTIFICATIONS OR REGISTRATIONS. (a) The department shall issue certifications and registrations to laboratories through certificates that meet the criteria specified in s. NR 149.06.

(b) The department shall issue a certificate to a laboratory submitting an initial, revised or reciprocal application for certification or registration within 30 days of the date by which the laboratory successfully completes an on-site evaluation, or the date by which the department waives an on-site evaluation.

1. The department may not schedule or waive an on-site evaluation of an applicant laboratory until all the requirements of sub. (1) have been completed.

2. A laboratory completes an on-site evaluation successfully when it addresses to the department's satisfaction any deficiencies encountered.

(c) The department may issue on a case-by-case basis certifications or registrations for selected fields of certification or registration under application in fields where the department does not encounter deficiencies, or in fields that are unaffected by encountered deficiencies.

NR 149.15 Period, renewal and expiration of certification or registration. (1) CERTIFICATION AND REGISTRATION PERIOD. (a) The certification and registration period shall commence on September 1 and end on August 31 of the following year for all laboratories certified or registered directly by the department.

(b) The certification and registration period for laboratories certified or registered by the department under an existing reciprocal recognition agreement shall commence on September 1 and end on August 31 of the following year, or on the expiration date of the certificates of approval documents issued by the entity with which the department has an agreement, whichever comes sooner.

(c) The department shall renew the certifications or registration of laboratories that meet the requirements of this section prior to September 1 of each year.

(2) RENEWAL PROCESS. (a) Prior to September 1, the department shall request that each certified or registered laboratory to do all of the following:

1. Complete an annual renewal application.

2. Pay the required annual renewal fee.

3. Submit acceptable proficiency testing sample results as required in subch. V.

(b) Prior to September 1, the department shall request that laboratories certified or registered through a reciprocal agreement submit, in addition to the fees and information specified in par. (a), certificates or official documents of their certifications, registrations, accreditations, licenses or approvals from the entity with which the department has the agreement.

(c) Laboratories with certifications or registrations obtained through reciprocal agreements with entities with certification, registration, accreditation, licensure or approval periods that do not coincide with the certification or registration period for laboratories certified or registered directly by the department, shall submit, within 30 days of their re-issuance, copies of the entity's certificate or approval documents. For these laboratories, the department shall provide revised certificates with:

1. Issuance dates to coincide with the dates of re-issued certificates or approval documents granted by entities with which the department has reciprocal agreements.

2. Expiration dates coinciding with the expiration dates of the re-issued certificates or approval documents granted by entities with which the department has reciprocal agreements, or an expiration date of August 31 of the year that is not more than 12 months after the issuance dates of the certificates or approval documents.

(3) EXPIRATION OF CERTIFICATIONS OR REGISTRATIONS. (a) The department shall expire on September 1 of the year that is not more than 12 months after their certificates' issuance dates the certifications or registrations of laboratories failing to provide the information and fees specified in sub. (2)(a) and any assessed administrative fees.

(b) The department shall expire the certifications or registrations of laboratories certified or registered through an existing reciprocal agreement that fail to provide the information specified in sub. (2)(c) on the day after the expiration date of their certificates.

(4) VOLUNTARY WITHDRAWAL OF CERTIFICATIONS OR REGISTRATIONS. Laboratories may voluntarily withdraw certifications or registrations at the time they complete their annual renewal applications, or at any other time by notifying the department in writing.

NR 149.16 Notification of relocation. (1) Laboratories relocating shall notify the department in writing, at least 30 days prior to the relocation, of their change of address and any changes in their contact information.

(2) The department shall issue a revised certificate to a relocating laboratory within 30 days of receiving the notification or the effective date of the relocation, whichever is later.

(3) Laboratories undergoing a change of ownership, needing to add certifications or registrations, modifying their certification or registration status, changing the entity by or through which they obtained certifications or registrations as a result of a relocation shall comply with the requirements of s. NR 149.14.

(4) The department may perform an on-site evaluation of the relocating laboratory at its new location to determine the laboratory's continued ability to comply with the requirements of this chapter.

NR 149.17 Laboratory name change. (1) Laboratories that change names without changing ownership shall notify the department in writing within 30 days of the effective date of the name change.

(2) The department shall issue a revised certificate to a laboratory changing its name without changing ownership and not seeking additional certifications or registrations within 30 days of receiving notification from the laboratory.

(3) The department may not charge a fee for processing laboratory name changes or for issuing a revised certificate resulting solely from a name change.

NR 149.18 Subcontracting of analyses by certified or registered laboratories. (1) Laboratories needing or desiring to have samples they have received or for which they are responsible be analyzed by another laboratory shall only have the associated samples analyzed in laboratories that have valid certifications or registrations under this chapter.

(2) Registered laboratories may not accept for remuneration, directly or under a subcontract, any samples collected for determining or supporting compliance with a covered program.

(3) Laboratories accepting samples under a subcontract from another laboratory shall be responsible for maintaining any analytical records needed to determine compliance with this chapter. The records shall be made available to the laboratory providing the samples and the department upon request.

NR 149.19 Requirements for certification in the drinking water matrix. This section applies to laboratories analyzing drinking water for compliance with the safe drinking water program and that analyze drinking water samples in support of the compliance monitoring required by ch. NR 809.

(1) GENERAL REQUIREMENTS. (a) The minimum criteria and procedures for certification in the drinking water matrix are specified in Chapters III and IV of the "Manual for the Certification of Laboratories Analyzing Drinking Water", EPA815-R-05-004, fifth edition, EPA, Office of Ground Water and Drinking Water, January 2005, except that:

1. The department may not grant provisional certification to laboratories.

2. The department may not grant interim certification to laboratories.

3. Laboratories shall analyze drinking water replicates or matrix spike duplicates at a frequency of one pair per preparation batch or one per 20 analytical samples in an analytical batch.

(b) Laboratories shall follow any additional criteria and procedures identified in this chapter applying to drinking water analyses.

(2) REQUIREMENTS FOR INORGANIC CONTAMINANTS. To receive certification to conduct analyses of inorganic contaminants, the laboratory shall achieve the method detection limits specified in 40 CFR 141.23 (a) (4) (i) and 40 CFR 141.89 (a) (1) (iii) or 10% of the MCL, for contaminants having an MCL, whichever is greater, for each method of analysis.

(3) REQUIREMENTS FOR VINYL CHLORIDE. To receive certification to conduct analyses of vinyl chloride, the laboratory shall achieve a method detection limit of 0.0003 mg/L for each method of analysis.

(4) REQUIREMENTS FOR OTHER VOLATILE ORGANIC COMPOUNDS. To receive certification to conduct analyses of volatile organic compounds, excluding vinyl chloride, but including trihalomethanes, the laboratory shall achieve method detection limits of 0.0005 mg/L for all regulated compounds for each method of analysis.

(5) REQUIREMENTS FOR SYNTHETIC ORGANIC CONTAMINANTS. To receive certification to conduct analyses of synthetic organic contaminants, the laboratory shall achieve the method detection limits specified in 40 CFR 141.24 (h) (18) or 10% of the MCL, whichever is greater.

(6) EXCLUSIONS FROM REQUIRED CERTIFICATION. (a) Fluoride analysis required under s. NR 809.705 need not be performed by a certified laboratory.

(b) Analysis for free chlorine residual and total chlorine residual required under s. NR 809.705 need not be performed by a certified laboratory.

(c) Analysis for pH required under s. NR 809.14 need not be performed by a certified laboratory.

(d) Analysis for turbidity required under s. NR 809.725, Table A need not be performed by a certified laboratory.

Note: The analyses referenced in this subsection need not be performed by a registered laboratory.

(7) NOTIFICATION TO AFFECTED WATER SUPPLY FACILITIES. Laboratories certified under this chapter for the drinking water matrix shall notify water supply facilities that an MCL exceedance has occurred no later than 48 hours after completing analyses whenever compliance samples exceed an MCL for any regulated analyte under ch. NR 809.

NR 149.20 Requirements for certification or registration in the whole effluent toxicity analyte class. This section applies to laboratories certified or registered in the aqueous matrix that perform whole effluent toxicity testing.

(1) GENERAL REQUIREMENTS. (a) The criteria and procedures for the certification or registration of laboratories performing whole effluent toxicity testing are specified in Table A of s. NR 219.04.

Note: Method for analyses for determining the toxicity of effluents are referenced in the "State of Wisconsin Aquatic Life Toxicity Testing Methods Manual", 2nd edition.

(b) Laboratories shall follow the requirements for quality systems specified in ss. NR 149.36 to 149.49.

(2) CHEMICAL TESTING IN SUPPORT OF WHOLE EFFLUENT TOXICITY TESTING. (a) Any laboratory performing tests for alkalinity, ammonia and hardness conducted in support of regulatory samples analyzed for whole effluent toxicity need not be certified or registered for those tests if the laboratory is certified or registered for performing whole effluent toxicity testing.

(b) Laboratories that are not certified or registered for performing whole effluent toxicity testing shall be certified or registered for performing tests for alkalinity, ammonia and hardness when those tests are undertaken in support of regulatory samples analyzed for whole effluent toxicity.

(c) Laboratories need not be certified or registered to perform tests for pH, conductivity, dissolved oxygen, and total residual chlorine when those tests are undertaken in support of regulatory samples analyzed for whole effluent toxicity.

NR 149.21 Fees. The department shall set a schedule of fees for laboratories participating in the program that is designed to recover the costs of administering this chapter.

(1) TOTAL FEE INCOME. (a) The program's total fee income shall be designed to generate revenues equal to the department of administration's approved spending authority for this program.

(b) The department may adjust the fee schedule according to the formulas in this subsection and the relative value unit items specified in Tables 1 and 2 of this subchapter. Annual fee adjustments shall be reviewed by the laboratory certification standards review council and approved annually by the natural resources board.

(c) The following formulas shall be used to generate and adjust the program's fee schedule.

1. Fee Income $\leq$ ASA − TR

a. Fee income is the total of all fees, including applications, renewals and late fees, that are collected in a given fiscal year.

b. TR is the total out-of-state travel reimbursement in a given fiscal year.

c. ASA is the approved spending authority for the given fiscal year. The department may substitute a lesser amount than the ASA if the ASA is greater than the estimated costs of the program.

d. Estimates of the fee income and travel reimbursement shall be calculated according to par. (d).

Note: The department of administration approved spending authority is given in s. 20.7379 (2) (fj), Stats., and may be revised by the department of administration to recover program cost.

2. Total # RV Units = $\sum$ (# Laboratories in Item) (RV of Item)

a. Total # RV Units is the total number of relative value (RV) units available for the fiscal year. The relative value units for each fee item (RV of item) are listed in Table 1 of this subchapter.

b. # Laboratories in item is a count of how many laboratories paid the fee for that item for a given fiscal year.

c. Total # of RV Units is calculated by summing the product of (RV of item) and (# laboratories in each item) for each item.

3. Cost per RV = (ASA − TR)/Total # RV Units. The Cost per RV is the dollar value assigned to one RV unit.

4. Cost of Item = (RV Unit of Item) (Cost per RV)

(d) The fees for the upcoming fiscal year shall be based upon program information from the previous fiscal year, and upon the approved spending authority for the upcoming fiscal year. The number of laboratories participating in the program shall be determined no earlier than 6 months prior to the billing for the upcoming fiscal year. The estimated travel reimbursement shall be equal to the travel reimbursement from the preceding fiscal year. The calculated fees may not be adjusted during the current fiscal year once laboratories have been billed.

(2) ANNUAL FEES. The department shall assess an annual fee to each laboratory holding certifications or registrations under this chapter either directly or through recognition agreements. A laboratory's annual fee shall be the sum of all of the following:

(a) The base fee for certification or registration, considering any minimum specified in sub. (7).

(b) The matrix fee.

(c) Analytical technique or analytical class fees, considering any maximum specified in sub. (8).

(d) Any outstanding administrative fees.

(3) BASE FEES. The department shall assess a base fee to all laboratories holding certifications or registrations under this chapter. The number of relative units assigned to each type of base fee is specified in Table 1 of this subchapter.

(4) MATRIX FEES. The department shall assess a fee per matrix type to all certified and registered laboratories. The number of relative units assigned to each type of matrix fee is specified in Table 1of this subchapter.

(5) ANALYTICAL TECHNIQUE FEES. The department shall assess a fee per type of technique to all certified and registered laboratories in fields involving the aqueous and solid matrices based on the relative value units specified in Table 1 of this subchapter and subject to any maximum fee specified in Table 2 of this subchapter.

(6) ANALYTICAL CLASS FEES. The department shall assess a fee per analytical class to all certified laboratories in fields involving the drinking water matrix based on the relative value units specified in Table 1 of this subchapter.

(7) MINIMUM FEES. The department shall assess a minimum fee to all certified laboratories, except those specified in this subsection.

(a) Any laboratory only holding certifications for any or all of the following analytes in the aqueous matrix by any analytical technique:

1. Biochemical oxygen demand.

2. Carbonaceous biochemical oxygen demand.

3. Ammonia as nitrogen.

4. Orthophosphorus.

5. Total phosphorus.

6. Total dissolved solids.

7. Total solids.

8. Total suspended solids.

9. Total volatile solids.

10. Total volatile suspended solids.

(b) Any laboratory only holding certifications for any or all of the following analytes in the drinking water matrix by any method:

1. Nitrate.

2. Nitrite.

3. Nitrate plus nitrite.

4. Fluoride.

5. Lead.

6. Copper.

(8) MAXIMUM ANALYTICAL CLASS FEES. The department may not assess fees that exceed the maximum values identified in Table 2 of this subchapter for any combination of techniques used to determine analytes or analyte groups in the indicated analytical classes in fields involving the aqueous and solid matrices.

(9) APPLICATION FEES. The department shall assess fees for all applications specified in Table 1 of this subchapter.

(10) ADMINISTRATIVE FEES. The department shall assess fees to recover the administrative functions specified in Table 1 of this subchapter.

(11) REFUNDS. Fees are not refundable, except for overpayment.

(12) USE OF FEES. Fees shall be used to offset the cost to the department for certification and registration of laboratories, laboratory evaluations, discretionary acceptance of data, reciprocity, training and collection of fees.

(13) FEE REVISION. Any amendments to the formulas in this section shall be reviewed by the laboratory certification standards review council prior to being proposed as rule amendments.

(14) FEE ADJUSTMENT FOR APPLICATIONS. If an application is not completed within a single fiscal year, the department may adjust the fees on the application to recover the difference in fees between the year the application was submitted and the year the application was completed. The laboratory shall pay this difference prior to receiving certifications or registrations.

Table 1: Fees for Certification and Registration

	Item	**Relative Value Units**
I.	**ANNUAL CERTIFICATION AND REGISTRATION FEES[1]**	
	Base Fees	
	Base Fee, Certification	10
	Base Fee, Registration	5
	Minimum Annual Certification Fee	24
	Matrix Fees	
	Matrix Fee, Aqueous	5

	Matrix Fee, Drinking Water	5
	Matrix Fee, Solids	5
	Analytical Technique Fees for Aqueous and Solid Matrices	
	Colorimetric or Nephelometric Spectrophotometry	2
	Combustion or Oxidation	3
	Cold Vapor Atomic Absorption or Gaseous Hydride Spectrophotometry	3
	Electrometric Assays	1
	Flame Atomic Absorption Spectrophotometry	3
	Gas Chromatography	3
	Gas Chromatography-Mass Spectrometry	4
	Graphite Furnace Atomic Absorption Spectrophotometry	3
	Gravimetric Assays, Residues	1
	Gravimetric Assays, Oil and Grease	1
	High Performance Liquid Chromatography	4
	High Resolution Gas Chromatography-High Resolution Mass Spectrometry	10
	High Resolution Gas Chromatography-Low Resolution Mass Spectrometry	10
	Inductively Coupled Plasma Emission Spectrophotometry	3
	Inductively Coupled Plasma-Mass Spectrometry	4
	Ion Chromatography	3
	Liquid Chromatography-Mass Spectrometry	5
	Polarography	1
	Titrimetric or Potentiometric Titration Assays	1
	Ultra-Low Level Metals Assays	5
	Voltammetry	1
	Waste Characteristic Extractions	1
	Waste Characterization Assays	1
	Whole Effluent Toxicity Assays	5
	Other	Not to exceed 10[5]
	Analytical Class Fees for Drinking Water Matrix	
	Copper and Lead Only	4
	Dioxin	10
	Disinfection Byproducts	4
	Nitrate, Nitrite, Nitrate + Nitrite, and Fluoride Only	2
	Primary Inorganic Contaminants	8
	Secondary Inorganic Contaminants	4
	Synthetic Organic Contaminants[2]	8
	Volatile Organic Compounds and Trihalomethanes	4
II.	**APPLICATION FEES**	
	Initial Application	6
	Revised Application	3
	Reciprocity Application	4
	Transfer of Ownership Application	4
III.	**ADMINISTRATIVE FEES[1]**	
	Discretionary Acceptance	Actual Cost
	Evaluation Cancellation	Incurred Costs [3]
	Evaluation for Enforcement Follow-Up	Actual Cost
	Evaluation of Out-of-State Laboratories	Travel Cost
	Late Renewal Fee[4]	2

1. Any outstanding administrative fees may be included as part of the annual fee.

2. The analytical class fee for synthetic organic contaminants in the drinking water matrix does not include dioxin analyses.

3. Out of state laboratories may be required to reimburse the program for travel costs incurred by the cancellation or postponement of an evaluation, not limited to airfare, hotel and rental car expenses.

4. Assessed 30 days after payment due date.

5. Actual cost will be determined by the department considering the complexity of the technique.

Table 2: Maximum Fees

Analytical Classes for Aqueous and Solid Matrices	**Maximum Relative Value**
Base, Neutral, and Acid Extractable Semivolatile Compounds	10
Demand	3
Metals, other than Ultra-Low Level Analysis	10
Nutrients	5
Pesticides	16
Petroleum Hydrocarbons	10
Physical	2
Polynuclear Aromatic Hydrocarbons	8
Polychlorinated Biphenyls	4
Polychlorinated Biphenyl Congeners	8
Polychlorinated Dibenzo-p-Dioxins and Furans	10
Volatile Organic Compounds	8
Wet Chemistry	10

SUBCHAPTER V
PROFICIENCY TESTING

NR 149.22 Required analyses of proficiency testing samples. (1) REQUIREMENTS. (a) Laboratories shall participate in at least one single-concentration proficiency testing study per certification or registration period for each analyte or analyte group identified by the department as specified in sub. (2).

1. For aqueous and solid matrices, laboratories shall analyze proficiency testing samples for each combination of technique and analyte or analyte group in a laboratory's fields of certification or registration.

2. For the drinking water matrix, laboratories shall analyze proficiency testing samples for each combination of method and analyte or analyte group in a laboratory's fields of certification.

(b) Single-concentration proficiency testing studies may be those offered at set intervals by proficiency testing sample providers, "rapid response" samples, or custom formulations approved by the department.

(2) LISTS OF REQUIRED PROFICIENCY TESTING SAMPLES AND APPROVED PROVIDERS. (a) The department shall publish a list of required proficiency testing samples and approved proficiency testing sample providers annually. The department shall seek the advice of the certification standards review council prior to identifying required proficiency testing samples and approved sample providers.

(b) The list shall identify matrix-specific proficiency testing samples required for submittal with renewal, initial or revised applications and the specific providers approved for supplying each required sample.

(3) EXEMPTIONS. (a) Laboratories performing the following analytical techniques for metals analysis in aqueous and solid matrices shall analyze known quality control samples 3 times per year at evenly spaced intervals in lieu of analyzing proficiency testing samples:

1. Flame atomic absorption spectrophotometry.

2. Colorimetric, for analytes other than hexavalent chromium.

3. Voltammetry.

4. Polarography.

(b) Laboratories analyzing ultra-low level metals in aqueous and solid matrices shall analyze known quality control samples 3 times per year at evenly spaced intervals in lieu of analyzing proficiency testing samples. Known quality control sample analytes shall be diluted to fall within the working concentration of the analytical technique.

NR 149.23 Approval of proficiency testing sample providers. (1) The department shall establish procedures for approving proficiency testing sample providers.

(2) When evaluating a proficiency testing sample provider for approval, the department shall consider criteria including, but not limited to, the provider's:

(a) Accreditation status by the national institutes of technology's national voluntary laboratory accreditation program.

(b) Accreditation status by other nationally recognized accreditation programs.

(c) Use of techniques for calculating acceptance limits as specified in s. NR 149.27.

(d) Ability to submit results to the department in a format specified by the department, including electronic media.

NR 149.24 Schedule of analysis. (1) APPLICATIONS FOR AQUEOUS AND SOLID MATRICES. Laboratories submitting initial or revised applications for certification or registration in aqueous and solid matrices shall analyze proficiency testing samples from an approved proficiency testing sample provider and submit acceptable results for each technique and analyte or analyte group for which the department has identified that proficiency testing samples are required.

(a) Acceptable proficiency testing samples shall be analyzed no more than 6 months prior to the date of application.

(b) The department may not grant a certification or registration unless the associated proficiency testing sample results meet the criteria specified in s. NR 149.27.

(2) APPLICATIONS FOR DRINKING WATER MATRIX. Laboratories submitting initial or revised applications for certification in the drinking water matrix shall analyze proficiency testing samples from an approved proficiency testing sample provider and submit acceptable results for each method and analyte or analyte group.

(a) Acceptable proficiency testing samples shall be analyzed no more than 6 months prior to the date of application.

(b) The department may not grant a certification or registration unless the associated proficiency testing sample results meet the criteria specified in s. NR 149.27.

(3) ANNUAL RENEWAL FOR AQUEOUS AND SOLID MATRICES. Laboratories seeking renewal of certification or registration for aqueous or solid matrices shall analyze at least one proficiency testing sample from an approved proficiency testing sample provider and submit acceptable results for each technique and analyte or analyte group for which the department has identified that proficiency testing samples are required. Laboratories with 3

consecutive proficiency testing sample failures in a year for any technique and analyte or analyte group shall submit 2 consecutive acceptable proficiency testing samples from an approved proficiency testing sample provider for that technique and analyte or analyte group.

(a) Proficiency testing samples shall be analyzed during the certification or registration period immediately preceding the period for which renewal is sought.

(b) Reports from proficiency testing sample providers shall be received by the department on or before August 15 of each year.

(c) The department may not renew a certification or registration unless the associated proficiency testing sample results meet the criteria specified in s. NR 149.27.

(4) ANNUAL RENEWAL FOR DRINKING WATER MATRIX. Laboratories seeking renewal of certification for the drinking water matrix shall analyze at least one proficiency testing sample from an approved proficiency testing sample provider and submit acceptable results for each method and analyte or analyte group.

(a) Proficiency testing samples shall be analyzed during the certification or registration period immediately preceding the period for which renewal is sought.

(b) Reports from proficiency testing sample providers shall be received by the department on or before August 15 of each year.

(c) The department may not renew a certification or registration unless the associated proficiency testing sample results meet the criteria specified in s. NR 149.27.

NR 149.25 Treatment of proficiency testing samples by laboratories. (1) Laboratories shall specify the procedures used to handle and analyze proficiency testing samples in the laboratories' quality manuals.

(2) Proficiency testing samples shall be subjected to any preparatory steps undergone by analytical samples, unless the preparation instructions submitted by a provider specifically instruct omitting a preparatory step.

Note: Preparatory steps include digestions, distillations, extractions, concentrations and dilutions.

(3) Laboratories may report multiple results of multiple analyses of a single proficiency testing sample when a laboratory maintains certifications or registrations for multiple techniques for any analyte or analyte group in aqueous and solid matrices.

(4) Laboratories may report multiple results of a single proficiency testing sample when the laboratory maintains certifications for multiple methods for any analyte or analyte group in the drinking water matrix.

(5) Prior to submitting proficiency testing results to a proficiency testing sample provider:

(a) Laboratories may not send a proficiency testing sample, or portion of a proficiency testing sample to another laboratory for analysis.

(b) Laboratories may not knowingly analyze a proficiency testing sample, or a portion of a proficiency testing sample from another laboratory.

(c) Laboratories may not communicate results of a proficiency testing sample with another laboratory.

NR 149.26 Submittals. (1) Laboratories shall submit proficiency testing sample results to providers in accordance with the dates specified by the providers.

(2) Proficiency testing reports may be submitted to the department directly from the provider or by the laboratory, but it is the laboratory's responsibility to ensure the department receives the necessary reports for initial,

revised and renewal applications. Reports submitted by the laboratory shall be submitted in their entirety, without modification, to the department.

(3) Results from all proficiency testing reports issued to the department by providers shall be used to determine a laboratory's certification or registration status.

(4) Proficiency testing reports may be amended and reissued by the provider when errors attributable to the proficiency testing sample provider are identified. The department shall accept amended and reissued reports if they are:

(a) Clearly labeled as revised or reissued.

(b) Directly submitted to the department by the provider.

NR 149.27 Acceptance criteria and grading. (1) ACCEPTANCE CRITERIA. A laboratory's result for any analyte or analyte group is considered unacceptable if it meets any of the following conditions:

(a) The result falls outside the acceptance criteria.

(b) The laboratory reports a result for an analyte not present in the proficiency testing sample.

(c) The laboratory does not report a result for an analyte present in the proficiency testing sample.

(d) The laboratory fails to submit its results to the proficiency testing sample provider on or before the deadline for the proficiency testing study.

(2) GRADING. (a) Proficiency testing samples for analytes in aqueous and solid matrices shall be graded in accordance with acceptance limits established by the department considering criteria developed by EPA.

(b) For required proficiency testing sample analytes in aqueous and solid matrices for which EPA has not developed acceptance criteria, the department may develop limits based on its experience or information supplied by approved providers.

(c) When an insufficient number of laboratories participate in a study to generate peer-based acceptance limits in a proficiency testing sample with analytes for which EPA has not established acceptance criteria, the department may grade results using fixed acceptance limits.

(d) Proficiency testing sample analytes in drinking water shall be graded in accordance with the acceptance limits established in 40 CFR 141.23 (k)(3)(ii), 40 CFR 141.24 (f)(17)(i)(C) and (D), 40 CFR 141.24 (f)(17)(ii)(B), 40 CFR 141.24 (f)(19)(i)(A) and (B) and 40 CFR 141.89 (a)(1)(ii), or developed by EPA.

(e) Where certification or registration in an analyte group is based on passing a representative proficiency testing sample containing more than one analyte, the laboratory shall report acceptable results on at least 80% of the analytes to achieve acceptable results for that sample.

(f) The department shall establish procedures for evaluating false positives and false negatives reported in analyzed proficiency testing samples.

NR 149.28 Procedure for correcting unacceptable proficiency testing sample results. (1) AQUEOUS AND SOLID MATRICES. If a laboratory does not meet the acceptance limits for a particular analyte or analyte group and the laboratory does not have acceptable results on a previous sample analyzed during the same certification or registration period, the department shall require the laboratory to analyze a second proficiency testing sample.

(a) If the results of a second proficiency testing sample do not meet the acceptance limits, the department may initiate an assessment of the laboratory's quality control records if this action is necessary to validate data

generated by the laboratory. After failing 2 consecutive proficiency testing samples, the laboratory shall do all of the following:

1. Submit a corrective action report and initiate an action plan to correct the problems within 30 days of the date of notification of the second failure. This action plan shall include a timetable for correcting the problems and obtaining a third proficiency testing sample.

2. Analyze a third proficiency testing sample within the time frame approved by the department. If the results of the third proficiency testing sample do not meet the acceptance criteria, the laboratory shall analyze 2 subsequent and consecutive acceptable proficiency testing samples.

(b) The department may not renew the certification or registration of any laboratory that after failing 3 consecutive proficiency testing samples does not successfully analyze 2 subsequent and consecutive proficiency testing samples.

(c) When applying to have an analyte or analyte group reinstated after non-renewal for failing 3 consecutive proficiency testing samples, the laboratory shall provide acceptable results on 2 subsequent and consecutive proficiency testing sample studies for that analyte or analyte group.

(2) DRINKING WATER. If a certified laboratory does not meet the acceptance limits that have been established by the department, the department shall require the laboratory to analyze a second proficiency testing sample and may require the laboratory to submit a corrective action report. If the results of the second sample do not meet the acceptance criteria, the department may not renew the laboratory's certification and may revoke the laboratory's certification as specified in s. NR 149.10.

SUBCHAPTER VI
ON-SITE LABORATORY EVALUATIONS

NR 149.29 Purpose, type and frequency. (1) The department shall perform on-site evaluations to determine a laboratory's potential, actual or continued ability to comply with the provisions of this chapter.

(2) The department shall conduct announced on-site evaluations of laboratories once every 3 years in addition to the following:

(a) When a laboratory submits an application to become certified or registered in any field of certification or registration, unless the department waives the requirement to perform an evaluation. When the department does not waive an evaluation, the evaluation shall be performed within 90 days after the department determines that a received application is complete and satisfactory.

(b) When a laboratory changes its location, unless the department waives the requirement to perform an evaluation. When the department does not waive an evaluation, the evaluation shall be performed within 90 days after the department receives notification of the change in location.

(c) When the department determines that an evaluation is necessary to verify corrective action implemented by a laboratory to address deficiencies identified in a previous on-site evaluation.

(d) When the department has reason to believe that a laboratory is not in compliance with this chapter.

(3) The department may conduct unannounced on-site evaluations of a laboratory to verify compliance with this chapter after a notice of violation has been issued to a laboratory.

NR 149.30 Evaluation procedures and appraisal. (1) The department shall perform on-site evaluations of laboratories according to documented procedures that promote consistency in determining a laboratory's potential, actual or continued ability to comply with this chapter.

(2) The department shall provide forms that allow laboratories to appraise the evaluation process.

NR 149.31 Evaluation reports. (1) The department shall document the deficiencies of an on-site evaluation in reports issued to the evaluated laboratory.

(2) The report of an on-site evaluation shall be issued to a laboratory within 30 days of the conclusion of the on-site visit. When the department finds it necessary to issue an evaluation report at a date later than 30 days after the conclusion of an on-site visit, the department shall notify the laboratory within 10 days after the conclusion of the 30-day period about the delay and providing an expected delivery date for the report.

NR 149.32 Evaluation corrective action. (1) A laboratory shall take corrective action to address any deficiencies discovered during an on-site evaluation.

(2) A laboratory shall submit to the department within 30 days from the evaluation report's date a plan of corrective action to address all the deficiencies noted in the report. When a laboratory finds it necessary to submit a corrective action plan at a date later than 30 days after the evaluation report's date, the laboratory shall notify the department about the delay and provide an expected delivery date in consultation with the department.

(3) The department shall review the corrective action plan submitted by a laboratory and inform the laboratory whether the submitted plan addresses satisfactorily all noted deficiencies, or whether additional action or documentation is necessary to determine the laboratory's ability to comply with this chapter.

(a) When the department determines that the submitted corrective action plan addresses all noted deficiencies satisfactorily, the department shall inform the laboratory in writing within 180 days of the conclusion of the on-site visit that the evaluation process has been completed.

(b) When the department determines that additional action or documentation is needed to evaluate compliance with this chapter, the department shall agree on a date for a second submittal in consultation with the laboratory.

1. When the department determines that the second corrective action plan addresses all noted deficiencies satisfactorily, the department shall inform the laboratory in writing that the evaluation process has concluded.

2. When the department determines that the second corrective action plan does not address all the noted deficiencies satisfactorily, the department may schedule another evaluation to determine the laboratory's compliance with this chapter, expire any outstanding application that led to the original on-site evaluation or direct enforcement to the laboratory.

3. When a second evaluation is scheduled as a follow-up to a second corrective action plan, the department shall establish deadlines that resolve any remaining unresolved deficiencies expeditiously, but no later than 90 days after the conclusion of the follow-up visit.

NR 149.33 Conflicts of interest. (1) The department shall establish procedures to ensure and document that laboratory evaluators under its employment are free of any conflicts that would render them incapable of performing an objective and unbiased evaluation of a laboratory.

(2) A laboratory may request information and documents used by the department to establish that any evaluator assigned to perform the laboratory's evaluation is free of any conflicts of interest.

NR 149.34 Evaluator qualifications. (1) The department shall develop procedures to establish and evaluate the education, experience and credentials of the laboratory evaluators under its employment.

(2) A laboratory may request information and documents used by the department to establish that any evaluator assigned to perform the laboratory's evaluation has the necessary education, experience or credentials to perform evaluations competently.

SUBCHAPTER VII
QUALITY SYSTEMS

NR 149.35 General requirements. (1) SCOPE. This subchapter establishes personnel, quality assurance, quality control, method selection, sample handling and documentation requirements for laboratories.

(2) RESPONSIBILITY FOR QUALITY SYSTEM. Laboratories shall conduct their analytical activities under a quality system that incorporates the provisions of this subchapter. At least one individual, however named, within a laboratory's organization or under the laboratory's employment shall be identified to the department as responsible for establishing, implementing, assessing and revising, as needed, a laboratory's quality system.

NR 149.36 Laboratory personnel. (1) MANAGEMENT AND ANALYTICAL STAFF. The laboratory shall have personnel with education, training, or experience that allows them to comply with the requirements of this chapter.

(2) PERSONNEL INVOLVED IN DRINKING WATER ANALYSES. Additional education and training requirements of management and analytical staff involved in analyzing drinking water are contained in Chapters III and IV of the "Manual for the Certification of Laboratories Analyzing Drinking Water", EPA 815-R-05-004, fifth edition, EPA, Office of Groundwater and Drinking Water, January 2005.

(3) INITIAL DEMONSTRATION OF CAPABILITY. (a) Laboratory personnel shall demonstrate they can execute analyses they perform with competence by completing an initial demonstration of capability before analyzing any samples for a covered department program except that:

1. Laboratory personnel that can demonstrate through the successful analysis of 4 laboratory control samples, matrix spikes, replicates, proficiency testing samples or previously released proficiency testing samples during a period that does not exceed a year before the effective date of this chapter … [revisor insert date], are exempt from performing the initial demonstration of capability required in this subsection.

2. Laboratory personnel that have not performed an initial demonstration of capability may analyze regulatory samples if they do so under the supervision of personnel that have completed initial demonstrations of capability for the same tests in regulatory samples.

(b) Successful completion of the initial demonstration of capability shall be documented for all personnel performing analyses before they analyze regulatory samples. This demonstration shall be repeated whenever there is a change in analytical instrument or instrument type used for analyses, unless the change can be verified to have no significant effect on the accuracy, precision, sensitivity and selectivity criteria established for the previous instrument or instrument type.

(c) When laboratory personnel performing the demonstration cannot meet the acceptance criteria specified in this section, the personnel shall locate and correct the source of the problem and repeat the demonstration for the affected analyte.

(d) Initial demonstration of capability shall be performed by all personnel conducting analyses by following the protocols contained in methods specified by the department.

(e) When the department specifies methods that do not contain protocols for demonstrating initial capability, laboratory personnel performing analyses shall demonstrate initial capability by all of the following:

1. Attesting that they have read and can meet the specifications contained in the standard operating procedures in use at a laboratory, for methods for which analyzing fortified replicates is impossible.

2. Analyzing at least 4 aliquots of a quality control sample obtained from an outside source or at least 4 replicates of an inert matrix or homogenous sample fortified at the laboratory using stock standards that are prepared from a source different from those used in instrument calibration, for methods which are amenable to the analysis of fortified replicates, and calculating the mean recovery and the sample standard deviation for each analyte of interest.

a. The chosen quality control sample or inert matrix shall be of a consistency or state of matter similar to the certification or registration matrix associated with the method for which the demonstration is performed.

b. The concentration of the aliquots of the quality control sample or the replicates fortified at the laboratory shall be at a concentration within the calibration range of the method, near a regulatory limit or at least 10 times the detection limit of the method.

c. The mean recovery for each analyte of interest may not be less than 50% and may not be more than 150%, and the sample standard deviation for each analyte may not exceed 33, or the mean recovery and the standard deviation of each analyte of interest shall meet the acceptance criteria in another approved method for the same analytical technique and analyte.

(f) Laboratory personnel that have not performed any analyses for a year or more shall demonstrate capability to perform analyses by following the procedures contained in this section.

(4) CONTINUED DEMONSTRATION OF CAPABILITY. When laboratories follow methods required by the department that contain protocols for demonstrating continued capability, personnel performing analyses shall follow the protocols.

NR 149.37 Quality manual. (1) PURPOSE AND GENERAL PROVISIONS. The laboratory's quality system shall be defined in a quality manual, however named. All policies and procedures governing the laboratory's quality system shall be documented or referenced in the quality manual. All laboratory personnel shall follow the policies and procedures established by the quality manual.

(2) FORMAT. The quality manual shall have a format, however conceived, that addresses the content elements specified in this section. Content elements may be presented in narrative, tabular, schematic or graphical form. The manual shall be a document in hard copy or electronic format traceable to the laboratory.

Note: Although this section does not require a specific format for quality manuals, the formats suggested by these sources are acceptable to the department: "Standards of the National Environmental Laboratory Accreditation Conference" Chapter 5, or July 2003; "Manual for the Certification of Laboratories Analyzing Drinking Water", EPA 815-R-05-004, fifth edition, EPA, Office of Groundwater and Drinking Water, January 2005.

(3) CONTENT. The quality manual shall include, address, or make reference to, at a minimum, the following elements:

(a) Organization and management structure of the laboratory.

(b) Description of laboratory facilities.

(c) Procedures for retention, control and maintenance of documents used in or associated with analyses.

(d) Procedures for achieving traceability of standards, reagents and reference materials used to derive any results or measurements.

(e) Lists of all test methods used by the laboratory to analyze regulatory samples.

(f) Procedures for ensuring that the laboratory has the appropriate certifications or registrations required for the regulatory samples it will analyze.

(g) Procedures for handling received samples.

(h) Lists of major analytical instruments and support equipment.

(i) Procedures for calibration, verification and maintenance of major analytical instruments and support equipment.

(j) Procedures for handling and analyzing proficiency testing samples.

(k) Procedures for evaluating quality control samples, such as method blanks, laboratory control samples, matrix fortified samples and replicates.

(l) Procedures for exercising corrective action addressing quality assurance and quality control failures, discrepancies or nonconformance.

(m) Procedures for allowing, in exceptional circumstances, departures from quality systems policies and procedures.

(n) Procedures for reviewing analytical data.

(o) Procedures for reporting analytical results.

(4) REVISIONS. The quality manual shall be kept current by the responsible party, however named, for maintaining the laboratory's quality system. All editions or versions of the quality manual shall indicate the dates in which they were issued or revised.

(5) LABORATORIES ANALYZING DRINKING WATER SAMPLES. Laboratories performing tests in drinking water shall ensure, in addition to the requirements in this section, that the content elements specified in Chapter III of the "Manual for the Certification of Laboratories Analyzing Drinking Water", EPA 815-R-05-004, fifth edition, EPA, Office of Groundwater and Drinking Water, January 2005, are addressed, included or referenced in their quality manuals.

NR 149.38 Corrective action for quality system and quality control samples. (1) The laboratory shall take corrective action when:

(a) Departures from established policies and procedures in the quality system are identified or become apparent.

(b) Quality control samples or quality control indicators fail established criteria.

(2) The procedures for systems corrective action shall require investigation to determine the principal causes of the nonconformance. The laboratory shall implement changes indicated by an investigation to remedy nonconformance.

(a) Corrective action chosen to address nonconformance shall be that most likely to prevent recurrence of the same nonconformance.

(b) The laboratory shall document the chosen corrective action to address the nonconformance and any other changes resulting from corrective action investigations.

(3) Changes taken to address failures of quality control samples to meet established acceptance criteria shall be those that resolve or address the failure in an expeditious manner before affected results are released or reported by a laboratory.

(a) The standard operating procedures or the quality manual of the laboratory shall specify the corrective action to be taken in response to quality control sample failures.

(b) The laboratory shall document the chosen action to address the failure of quality control samples.

(c) The laboratory shall evaluate the need for taking systems corrective action when it experiences repeated failure of quality control samples.

(4) The laboratory shall monitor the effectiveness of implemented corrective action changes.

NR 149.39 Records and documents. (1) RECORDS AND DOCUMENTS RETENTION AND CONTROL. (a) The laboratory shall establish procedures to control and manage all records and documents that form part of its quality system and that are required to demonstrate compliance with this chapter.

(b) The procedures shall ensure that documents required to perform analyses and to ensure the quality of generated data are available to laboratory personnel, and that records and documents are reviewed periodically for continuing suitability and, when necessary, revised to facilitate compliance with the requirements of this chapter.

(c) The laboratory shall retain all records and documents that are part of its quality system and that are required to demonstrate compliance with this chapter for a minimum of 5 years after the generation of the last entry in a record or document. The laboratory shall retain records and documents for a longer minimum period, if they are necessary to reconstruct analytical results generated during a 5-year period.

(d) The department may require in writing that records be retained for a longer period than that specified in par. (c) if the department has initiated legal action involving test results or the certification or registration status of the laboratory.

(e) The laboratory shall identify to the department a responsible party for retaining documents and records for the required period in the event the laboratory changes ownership or ceases to be certified or registered.

(f) Records and documents shall be handled and stored in a manner that ensures their permanence and security for the required retention period, and that facilitates their retrieval to demonstrate compliance with this chapter.

(g) Records and documents shall be legible and their entries must be safeguarded against obliteration, erasures, overwriting and corruption.

1. Handwritten records shall be recorded in ink.

2. Records and documents that are stored only on electronic media shall be supported by the hardware and software necessary for their retrieval and reproduction into hard copy.

3. Corrections or other alterations made to entries in records or documents may not obscure the original entry.

4. The laboratory shall have procedures to prevent unauthorized access or amendments to records and documents.

(2) ADMINISTRATIVE RECORDS. Administrative records that laboratories shall maintain include:

(a) Certificates of certification or registration issued by the department, unless the department has requested a laboratory to return them.

(b) Certificates issued to the laboratory by entities with which the department has entered into a reciprocal agreement, if a laboratory is certified or registered for this chapter under any existing agreement.

(c) Records of personnel qualifications, experience and training when personnel are required to possess or maintain specific credentials by s. NR 149.36 (2).

(d) Records of demonstration of capability for each analyst required to perform the demonstrations specified in s. NR 149.36 (3) and (4).

(e) At least one copy of each version of this chapter in effect during the required record retention period.

(f) At least one copy of each version of the "Manual for the Certification of Laboratories Analyzing Drinking Water" in effect during the required record retention period for laboratories certified to perform drinking water analyses.

(g) Copies of or access to other regulations, standards and documents necessary for the laboratory to operate or to maintain compliance with this chapter.

(3) ANALYTICAL AND TECHNICAL RECORDS. (a) The laboratory shall maintain all analytical and technical records containing raw and derived data, or original observations, necessary to allow historical reconstruction of all laboratory activities that contributed to generating reported results.

(b) The format of the analytical and technical records of a laboratory shall facilitate access to the information in this subsection and may be contained in bench sheets, log books, notebooks, journals, manuals, standard operating procedures and forms, in hard copy or electronic media.

(c) Analytical and technical records retained by the laboratory shall allow access to information that includes:

1. Collection, arrival, processing and analysis dates of samples received for analysis.

2. Collection and analysis time, for tests with holding time of 48 hours or less.

3. Preservation status of samples on arrival at the laboratory.

4. Identity of laboratory personnel processing, preparing and testing samples, and involved in reducing and interpreting analytical data.

5. Identity of and reference to operating conditions of laboratory support equipment and analytical instruments used in or supporting analyses.

6. Identification of the analytes, or analyte groups assayed in samples.

7. Preparatory techniques, such as digestions, extractions and clean-ups, to which samples are submitted.

8. Methods of analysis used for samples.

9. Results of sample analysis.

10. Traceability of standards and reagents used to perform analysis.

11. Condition and calibration status of laboratory support equipment associated with sample analysis and storage.

12. Calibration procedures, frequency, and acceptance criteria for analytical instruments used in sample analysis.

13. Raw data for analytical instrument calibrations and samples.

Note: The department has exempted the retention of emission counts for samples and standards analyzed after an initial calibration for older models of inductively coupled plasma emission spectrophotometers that are incapable of providing that information when operated in the instrument calibration mode. This exemption will expire on December 31, 2010.

14. Procedures and techniques used for reducing or translating raw data and intermediate observations into reportable results.

15. Protocols for analysis of quality control samples, frequency of their analysis, their acceptance criteria and the statistical procedures used to evaluate quality control data.

16. Results of quality control samples associated with samples analyzed.

17. Sensitivity of all analyses to which samples are submitted.

18. Corrective actions associated with samples analyzed.

19. Maintenance performed on laboratory support equipment and analytical instruments.

20. Environmental conditions crucial to tests performed at laboratory facilities at the time samples are analyzed.

21. Reports of final results submitted to clients or the department.

NR 149.40 Standard operating procedures. (1) GENERAL REQUIREMENTS. (a) Laboratories shall maintain written standard operating procedures that document or reference activities needed to maintain their quality systems and that enable performing or reproducing an analysis in its entirety as performed at the laboratory.

(b) Standard operating procedures may be documents written by laboratory personnel or may consist entirely of copies of published documents, manuals or procedures if the laboratory follows the chosen source exactly.

(c) Standard operating procedures may consist in part of copies of published documents, manuals or procedures if:

1. Modifications to the published source are described in writing in additional documents.

2. Clarifications, changes or choices are completely described in additional documents, when published sources offer multiple options, ambiguous directives or insufficient detail to perform or reproduce an analysis.

(d) Standard operating procedures shall indicate their dates of issue or revision.

(2) ANALYTICAL METHODS MANUAL. (a) The laboratory shall have and maintain a list describing analytical test methods performed for programs covered by this chapter.

(b) The analytical methods manual may consist of published or referenced test methods, or standard operating procedures written by the laboratory as allowed in s. NR 149.40.

(c) The essential elements of test methods required in par. (d) may be presented in narrative, tabular, schematic or graphical form. The analytical methods manual shall be an identifiable document in hard copy or electronic format traceable to the laboratory.

(d) When the analytical methods manual consists of standard operating procedures written by the laboratory, each standard operating procedure shall include, address or make reference to, at a minimum, the following elements:

1. Identification of the test method.

2. Applicable analytes.

3. Applicable matrices.

4. Method sensitivity.

5. Potential interferences.

6. Equipment and analytical instruments.

7. Consumable supplies, reagents and standards.

8. Sample preservation, storage and hold time.

9. Quality control samples and frequency of their analysis.

10. Calibration and standardization.

11. Procedure for analysis.

12. Data assessment and acceptance criteria for quality control measures.

13. Corrective actions and contingencies for handling out of control or unacceptable data.

NR 149.41 Method selection. (1) The laboratory shall use methods for environmental testing approved by covered programs under this chapter, and that are suitable for the matrix, type of analyte, expected level of analyte, regulatory limit and potential interferences in the samples to be tested.

(2) When methods are not prescribed by covered programs under this chapter or permits issued by the department, the laboratory shall consult with the department to select a method that is suitable for the matrix, type of analyte, expected level of analyte, regulatory limit and anticipated interferences in the sample.

NR 149.42 Alternative methods. (1) The department may allow the use of alternative methods from those prescribed by programs covered under this chapter, including the safe drinking water program, if the environmental protection agency has granted approval for the alternative methods.

(2) The department may allow the use, on a case-by-case basis, of methods other than those specified by programs covered under this chapter, if a laboratory requests approval for using the methods and the applicable covered program, after consultation with the laboratory certification and registration program, determines that the allowance does not result in a detrimental effect on the quality and defensibility of the results to be generated.

(3) The department may allow the use of alternative methods by a laboratory, on a case-by-case basis, when programs covered under this chapter prescribe methods, if a laboratory requests approval for using a method that employs a new or emerging technology.

(a) Laboratories shall request consideration of approval for use of a method that employs a new or emerging technology to the laboratory certification and registration program.

(b) The request for consideration of approval for use shall include the reason for seeking the approval, a description of the principles of the new or emerging technology, and the potential scope of application of the method.

(c) The department shall approve or deny the request for consideration of approval for use within 90 days from the receipt of the request. The laboratory certification and registration program shall consider in its decision whether the covered programs that would be the recipients of the data generated by the method have a demonstrated need for allowing the new or emerging technology.

(d) If the request for consideration of approval for use is granted, the department shall establish criteria for validating the test method for the specific application and scope requested.

(e) If the laboratory's method validation results meet the established validation criteria, the department shall allow the use of the test method for the specific application and scope requested.

(f) The department may charge a fee under s. 299.11 (5) (d), Stats., if it is necessary to verify the results of the validation.

NR 149.43 Laboratory facilities. (1) The laboratory shall ensure that the environmental conditions of its facility do not adversely affect the required quality of any measurement.

(a) Laboratory facilities shall ensure effective separation between neighboring areas in which incompatible analytical activities take place. The laboratory shall take measures to prevent cross-contamination.

(b) Access to and use of areas affecting the quality of environmental tests shall be controlled to an extent commensurate with the type of analysis and samples analyzed by a laboratory.

(2) The laboratory shall monitor, control and record environmental conditions when this is required by approved test methods or when they influence the quality of test results.

NR 149.44 Laboratory equipment. (1) GENERAL PROVISIONS. (a) The laboratory shall be furnished with the equipment necessary and required for the correct performance of all the environmental tests and associated preparations and activities it performs.

(b) The equipment and software used for testing and calibration shall achieve the accuracy required to comply with the requirements of approved methods or specifications relevant to the environmental testing performed by the laboratory.

(2) LABORATORY SUPPORT EQUIPMENT. (a) All support equipment shall be kept in working order by submitting it to routine and preventive maintenance.

(b) When support equipment leaves the direct control of the laboratory for maintenance or for any other reason, the laboratory shall ensure that the function and calibration status of that equipment is checked or demonstrated to be satisfactory before the equipment is returned to service.

(3) CALIBRATION AND VERIFICATION OF SUPPORT EQUIPMENT. (a) All support equipment shall be calibrated or verified over its range of use using available reference materials traceable to the national institute of standards and technology. When reference materials traceable to the national institute of standards and technology are not produced, manufactured or commercially available, the laboratory shall use materials of a quality that will ensure the accuracy of the calibrated or verified support equipment for its intended use.

(b) The acceptability criteria for these calibration verification checks shall be established by approved test methods, department regulations or, in their absence, tolerances established by manufacturers.

(c) When the results of the calibration or calibration verification of support equipment do not meet the specifications of the application or method for which the equipment is used, the equipment shall be removed from service until repaired; however, if the deviation from the calibration specifications results in a consistent bias, the equipment may remain in service if correction factors are applied to all measurements made with the deviating equipment.

(d) Devices used to measure the temperature of ovens, incubators, water baths, refrigerators, freezers and samples received at the laboratory shall be calibrated or verified at least yearly against thermometers traceable to the national institute of standards and technology.

(e) The operating temperature of autoclaves, incubators, ovens and water baths used as part of a method shall be checked to meet the temperature requirements of that method each day they are used.

(f) Refrigerators, freezers, ovens and incubators holding samples continuously as part of standard operating conditions shall be checked on each day that laboratory personnel conduct analyses. The laboratory shall

endeavor to set equipment settings and conditions that maintain required temperatures on days that personnel do not conduct analyses.

(g) Analytical balances that have been used at least once in a month shall be checked monthly with a minimum of one weight in the gram range and a minimum of one weight in the milligram range. The weights used to perform these checks shall be:

1. Traceable to the national institute of standards and technology, and shall be of class or type suitable for verifying the accuracy of analytical balances.

2. Certified for accuracy every 3 years by a metrology service outside the laboratory or a new set of weights of suitable class or type traceable to the national institute of standards and technology shall be purchased for use.

3. Handled and stored in a manner that protects their integrity.

(h) Non-analytical balances that have been used at least once in a month shall be checked monthly with at least one weight in the expected range of their use. The weights used to perform these checks may be traceable to or verified against those traceable to the national institute of standards and technology.

(i) Mechanical and automatic volumetric dispensing devices, including micro-pipettes, burettes and automatic dilutors and dispensers, that are not class A glassware shall be checked for accuracy at least quarterly when they are in use.

(j) Glass microliter syringes do not need to be checked for accuracy each quarter if they are documented to be as accurate as class A glassware.

(k) Disposable pipettes need not be checked for accuracy when they are used in method steps or applications that do not require use of class A glassware.

(4) LABORATORY ANALYTICAL INSTRUMENTS. (a) Laboratory analytical instruments shall be operated by personnel trained in their use. Instructions on the use and maintenance of equipment shall be available to instrument operators.

(b) All instruments shall be properly maintained, inspected and cleaned. The laboratory shall establish procedures for the maintenance of analytical instruments to prevent contamination or deterioration that may affect reported results.

(c) Analytical instruments that give suspect results or that have been shown to be defective or outside of performance specifications shall be taken out of service.

(d) When analytical instruments leave the direct control of the laboratory for maintenance or for any other reason, the laboratory shall ensure that the functional and calibration status of those analytical instruments are checked or demonstrated to be satisfactory before the instruments are returned to service.

(5) INSTRUMENT CALIBRATION GENERAL PROVISIONS AND REQUIREMENTS. (a) All analytical instruments shall be calibrated at least once in any year in which they have been used, and shall be calibrated or their calibration verified before they are used to provide any quantitative results.

(b) When more stringent instrument initial calibration or continuing calibration verification requirements are required in mandated test methods or regulations, laboratories shall follow the more stringent requirements, unless:

1. A test method requires analyzing more than 3 standards to establish a linear calibration, and the laboratory chooses to narrow the calibration range of the determination to no more than 2 orders of magnitude and uses at least 3 standards to generate an initial calibration.

2. A test method requires analyzing more than one continuing calibration verification standard to verify a linear calibration and the laboratory has narrowed the calibration range of the determination to no more than 2 orders of magnitude and uses at least one standard to verify continued calibration.

(6) INITIAL INSTRUMENT CALIBRATION. (a) The details of initial instrument calibration procedures, including, calculations, integrations, acceptance criteria and associated statistics shall be included or referenced in the test method standard operating procedure. When initial instrument calibration procedures are cited by reference in the test method standard operating procedure, the laboratory shall retain the referenced material.

(b) The laboratory shall select a calibration model that is appropriate for the expected behavior of the analytical instrument to be calibrated.

(c) To establish calibration, the laboratory shall select a number of standard concentrations, different from zero, that is:

1. Appropriate to the calibration model selected and the expected range of concentrations; and

2. Sufficient to establish a relationship between instrument response and concentration that fits the specific instrument for its intended use; or

3. Sufficient to corroborate a universally established theoretical relationship between instrument response and concentration, or to tune an instrument to a universally accepted scale, as in the case of pH meters.

(d) The minimum number of standard concentrations selected to establish calibration shall be 3 except for:

1. Dissolved oxygen meters, which shall be calibrated against water-saturated air, air-saturated water at a known temperature and pressure or by reference to an aliquot of air-saturated water analyzed by the Winkler or iodometric method.

2. Ion selective electrodes and pH meters, the minimum number shall be 2.

3. Inductively coupled plasma emission spectrophotometers and inductively coupled plasma mass spectrometers, the minimum number shall be one.

4. Calibration models that are quadratic, the minimum shall be 5.

5. Calibration models that are cubic, the minimum shall be 7.

(e) The concentration of the standards chosen to establish a calibration function shall be within the same orders of magnitude as the expected concentration of samples to be quantitated with an initial calibration. Laboratories reporting results at levels at or near the limit of detection of an analysis shall include in initial calibrations a standard at a concentration near the limit of quantitation of the analysis.

(f) To generate a calibration function, the laboratory shall select a reduction technique or algorithm that is appropriate for the calibration model and number of standard concentrations selected.

1. The selected algorithm or reduction technique shall be describable mathematically, and shall provide equations, coefficients or parameters necessary to characterize the calibration function uniquely, unless an analytical instrument is tuned to conform to a universally accepted scientific law or scale.

Note: The response of dissolved oxygen meters is generally adjusted to conform to the concentration of oxygen allowable in a given fluid at a specified temperature and pressure. The response of an ion selective electrode is generally tuned to conform to the Nernst equation. The response of pH meters is tuned to conform to the universally accepted pH scale. When these instruments are adjusted or tuned according to these principles, characterizing the calibration reduction algorithm mathematically is not necessary.

2. The laboratory shall select the simplest algorithm or reduction technique that satisfies calibration acceptability criteria, or

3. The laboratory may use a more complex algorithm or reduction technique, compatible with the number of standard concentrations selected that satisfies acceptability criteria if the calibration is verified with a number of standards appropriate to the more complex algorithm or reduction technique, unless the more complex algorithm or reduction technique is chosen to compensate for instrument saturation, insensitivity or malfunction.

4. The laboratory may use weighted algorithms or reduction techniques, unless they are chosen to compensate for deviations from the expected behavior of a detector of an analytical instrument resulting from instrument saturation, insensitivity or malfunction.

5. The laboratory may not use reiterative reduction techniques or algorithms that force calibration functions through zero.

Note: Reiterative reduction techniques or algorithms that force through zero obtain mathematically, by repeated application, a null response for a zero standard that has a non-zero response, or adjust calibration parameters to obtain a theoretical null response without analysis of a calibration blank. This paragraph does not prohibit the use of average response factors or automatic zeroing as part of an initial calibration, when methods, regulations or covered programs allow those techniques.

(g) The laboratory shall establish acceptability criteria for initial calibrations. The type of criteria chosen and the acceptance range shall be appropriate for the type of analytes to be quantitated, the calibration model selected and reduction technique or algorithm chosen.

1. When average response factors are used to reduce calibration data, the relative standard deviation of the response factors may not exceed 20%, unless an approved method of analysis allows a larger percentage.

2. When linear regression or least squares analysis is used to reduce calibration data for inorganic analytes and metals, the correlation coefficient of the resultant calibration curves shall be at least 0.995.

3. When linear regression or least squares analysis is used to reduce calibration data for organic analytes, the correlation coefficient of the resultant calibration curves shall be at least 0.99.

4. When quadratic regression analysis is used to reduce calibration data for inorganic analytes and metals, the coefficient of determination of the resultant calibration curves shall be at least 0.995.

5. When quadratic regression analysis is used to reduce calibration data for organic analytes, the coefficient of determination of the resultant calibration curves shall be at least 0.99.

(h) The laboratory shall establish procedures for the treatment of calibration zeroes, when a mandated method or an analytical technique requires the response of a calibration blank to be part of a calibration function.

(i) Laboratories shall verify all initial instrument calibrations after they are generated but before they are used to quantitate any samples, with a standard obtained from a source different from the one used to generate initial calibrations, unless:

1. An instrument is calibrated by tuning it to conform to a universally accepted scientific law or scale, as is the case with pH meters, ion selective electrodes and dissolved oxygen meters.

2. A laboratory procures quality control samples of known concentration from a provider outside the laboratory and analyzes and evaluates them as specified in s. NR 149.48 (8).

Note: These quality control samples are formulated by providers at known and validated concentrations that are available to the laboratory before the samples are analyzed. They are not proficiency testing samples, but are similar to the quality control samples formerly known as “blind standards”, although their concentration can be known to the analysts.

(j) Unless otherwise required by regulation, method or program, the acceptance criteria for this second source verification shall be that required under sub. (7) for continuing instrument calibration verification.

(k) Laboratories shall quantitate sample results only from initial instrument calibrations, unless otherwise allowed by regulation, method or covered program.

(l) Laboratories shall quantitate sample results by bringing their associated responses to the ranges specified in this section.

1. Except for samples analyzed by inductively coupled plasma emission spectrophotometers and inductively coupled plasma mass spectrometers, samples having responses greater than that of the most concentrated standard of an initial calibration allowed to be established with at least 3 different standard concentrations shall be diluted and reanalyzed. When samples cannot be diluted and reanalyzed, sample results shall be reported with appropriate qualifiers or narrative warnings.

2. Samples analyzed by inductively coupled plasma emission spectrophotometers and inductively coupled plasma mass spectrometers having responses at or above 90% of the established upper limit of the linear dynamic range of the instruments shall be diluted and reanalyzed. When samples cannot be diluted and reanalyzed, sample results shall be reported with appropriate flags or narrative warnings.

3. Samples analyzed by inductively coupled plasma emission spectrophotometers and inductively coupled plasma mass spectrometers having responses below 90% of the established upper limit of the liner dynamic range of the instruments but above the response of the highest concentration of standard in an initial calibration may be reported without resorting to dilution.

(m) Once a calibration model is selected, a calibration function is established and an initial calibration is finalized, a laboratory may not change the model or calibration function after samples have been analyzed without performing another initial calibration.

(n) Laboratories shall perform an initial calibration after instruments undergo non-routine maintenance, when repeated use or other conditions change their expected behavior, and when their continuing calibration cannot be verified.

(o) Laboratories shall retain all the raw data necessary to reconstruct or reproduce, independently of analytical instruments, all calibration functions associated with initial calibrations.

(7) CONTINUING INSTRUMENT CALIBRATION VERIFICATION. (a) When an initial instrument calibration is not performed on the day of analysis, the validity of the initial calibration shall be verified prior to quantitating samples by continuing calibration verification with each analytical batch and at least once on each analysis day.

(b) The details of the continuing instrument calibration procedure, calculations and associated statistics shall be included in the test method standard operating procedure. When continuing calibration verification procedures are cited by reference in the test method standard operating procedure, the laboratory shall retain the referenced material.

(c) The calibration standards analyzed to demonstrate continuing instrument calibration shall be obtained from the same source used to generate an initial calibration.

(d) The number of calibrations standards needed to be analyzed to demonstrate continuing instrument calibration shall be appropriate to the calibration model selected, the reduction technique or algorithm used to generate a calibration function, and the number of standards required to establish initial calibration.

1. When initial calibration is accomplished by tuning an instrument to conform to a universally accepted scientific law or scale, continuing calibration shall be verified by analyzing a single verification standard at any concentration, if using one standard is allowed to establish initial calibration.

2. When initial calibration is accomplished by tuning an instrument to conform to a universally accepted scientific law or scale, continuing calibration shall be verified with a standard at concentration within the range established by 2 calibration standards, if using 2 standards is allowed to establish initial calibration.

3. When the calibration function selected uses an average of responses to obtain a calibration or response factor, is linear regression or least squares analysis, or otherwise obeys a linear model, the laboratory shall analyze at least a single verification standard. The concentration of the standard may be varied within the established calibration range.

4. When the calibration function selected uses quadratic regression or otherwise obeys a quadratic model, the laboratory shall analyze at least 2 verification standards. One of the standard concentrations shall be chosen to verify continuing calibration near the point of inflection of the calibration function.

5. When the calibration function selected uses cubic regression or otherwise obeys a cubic model, the laboratory shall analyze at least 3 verification standards. Two of the standard concentrations shall be chosen to verify continuing calibration near the points of inflection of the calibration function.

6. When the calibration function selected generates discrete or non-smooth segments, the validity of each segment shall be verified with standards at concentration different from the ones used to establish each segment.

(e) Continuing calibration verification shall be performed:

1. At the beginning of each analytical run, unless an initial calibration has been performed on the day samples are analyzed.

2. At the end of each analytical run, unless the laboratory uses internal standards to quantitate samples or uses the calibration verification standard analyzed at the beginning of the next analytical run as the closing verification standard of the previous run, provided instrument conditions are not changed between runs.

3. After the consecutive analysis of each group of 20 samples, if 20 or more samples constitute an analytical run.

(f) The laboratory shall establish acceptance criteria for continuing calibration verification. The type of criteria chosen and the acceptance range shall be appropriate for the calibration model selected and reduction technique or algorithm chosen. Unless otherwise required by regulation, method or program, the acceptance criteria for continuing calibration shall be:

1. Obtaining concentrations within 10% of the respective actual concentrations of all reportable inorganic analytes and metals from an initial calibration.

2. Obtaining concentrations within 15% of the respective actual concentrations of all reportable organic analytes from an initial calibration.

(g) When the continuing calibration verification results obtained are outside acceptance criteria, the laboratory shall perform another calibration verification. If the results of this calibration verification fail to meet acceptance criteria, the laboratory shall take corrective action and perform an initial calibration unless 2 consecutive calibration verifications performed after taking corrective action meet acceptance criteria.

(h) Samples associated with a failing calibration verification shall be reanalyzed, unless the following conditions are met:

1. Calibration verification concentrations obtained are higher than the acceptance criteria, there are no detected corresponding analytes in the analyzed samples, or sample results are below a regulatory or decision limit, and the associated sample results are reported with appropriate qualifiers.

2. Calibration verification concentrations obtained are lower than the acceptance criteria, all corresponding analytes in the associated samples exceed a regulatory limit or decision level, and the associated sample results are reported with appropriate qualifiers.

3. The affected samples have been consumed in analysis and the associated sample results are reported with appropriate qualifiers.

4. The holding time of the affected samples has expired and the associated sample results are reported with appropriate qualifiers, unless, after consultation with the department or client, either one determines that re-sampling is necessary.

(i) Laboratories shall retain all the raw data necessary to reconstruct or reproduce, independently of analytical instruments, results of continuing calibration verifications.

NR 149.45 Measurement traceability. (1) STANDARDS, REAGENTS AND REFERENCE MATERIALS. (a) The laboratory shall ensure that results of analyses can be linked to all the standards and reagents used to derive results. Standards and reagents used in analyses should conform to the purity specifications contained in approved methods of analysis. When approved methods of analysis do not specify the purity of the standards and reagents to be used, the laboratory shall choose standards and reagents of sufficient purity to ensure the validity of reported results.

(b) The laboratory shall certify the accuracy of all reference materials used to calibrate or verify the calibration of analytical support equipment. Reference materials shall be calibrated by a body independent of that in charge of analytical operations that can provide traceability to primary standards maintained by the national institute of standards and technology. When reference materials traceable to the national institute of standards and technology are not produced, manufactured or commercially available, the laboratory shall use materials of a quality that will ensure the accuracy of the calibrated or verified support equipment for its intended use.

(c) The laboratory may not use standards and reagents beyond their expiration dates, unless the laboratory can verify their reliability in a defensible manner.

(2) DOCUMENTATION AND LABELING OF STANDARDS, REAGENTS AND REFERENCE MATERIALS. (a) The laboratory shall document the identity, source and purity of all standards and reagents used in tests methods performed. The laboratory shall retain records of certificates of analysis or purity, when the records are provided by the supplier, and are necessary to establish the identity, source or purity of standards and reagents.

1. Original containers of standards and reagents shall be labeled with a receipt and an expiration date.

2. The laboratory shall document the lot number, manufacturer, date of receipt and the date of expiration of stock standards and reagents separately from their containers to ensure this information will be retained when the containers are discarded.

3. The laboratory shall maintain records that detail the preparation of intermediate and working standards and reagents. These records shall link the intermediate and working standards and reagents to their respective originating stocks or neat compounds and shall indicate their date of preparation, expiration and the identity of the preparer.

(b) The laboratory shall retain records and certificates that trace reference materials used to calibrate or verify analytical support equipment to the source of the corresponding reference materials. The laboratory shall retain records demonstrating that the accuracy of the reference materials has been certified or verified by a body outside of that in charge of analytical operations at the required frequencies.

NR 149.46 Handling of samples. (1) SAMPLE COLLECTION. (a) The laboratory shall retain records supplied by the collector to allow the laboratory to evaluate collection procedures against the laboratory's sample acceptance policy.

(b) When the laboratory provides containers and preservatives for sample collection, including bulk sampling containers such as "carboys", the laboratory shall ensure that the containers are free of the analytes of interest and that the preservatives used are sufficiently pure to maintain the validity of reported results. Containers supplied by the laboratory for sample collection shall allow collecting a sufficient amount of sample to perform all required or requested determinations at the required or desired sensitivity.

Note: The laboratory should establish procedures to ensure and document that the sample containers it provides do not contribute contaminants before they are used for collecting samples.

(2) SAMPLE ACCEPTANCE POLICY. (a) The laboratory shall have and follow a written policy that clearly outlines the conditions under which samples will be accepted or rejected for analysis, or under which associated reported results will be qualified.

1. Drinking water samples received beyond holding time, improperly preserved, in inappropriate containers or showing evidence that they have not been collected according to approved or accepted protocols shall be rejected for analysis, unless the laboratory can document that it has been instructed by the client to proceed with analyses, and all associated results are accompanied by a disclaimer attesting that results may not be used to determine or evaluate compliance with the safe drinking water act.

2. The results of samples that are not drinking waters shall be appropriately qualified if the samples are received improperly preserved, in inappropriate containers, beyond holding time, with insufficient volume to complete requested analyses, or if the laboratory has evidence that the samples have not been collected according to approved or accepted protocols. Alternatively, the laboratory may reject the samples for analysis.

(b) When samples received do not conform to the descriptions provided by a collector, the laboratory shall consult with the collector or sample originator to determine the processing or disposition of the samples.

(3) SAMPLE HANDLING PROTOCOLS. (a) The laboratory shall establish and follow procedures for identifying samples uniquely. The procedures shall ensure that the identity of samples cannot be confused physically or when referenced in records or other documents.

1. Samples received by a laboratory for analysis shall be assigned a unique identification code.

2. The unique identification code shall be placed on a sample container as a durable label.

3. The unique identification code shall be used as a link to associate samples with their complete history, including treatment and analysis, while in the laboratory's possession.

(b) For samples received by a laboratory more than 15 minutes after their collected time, the laboratory shall determine and document the preservation status of samples when they are received. This shall include:

1. The temperature at receipt, for samples that require thermal preservation in transport.

a. Samples requiring thermal preservation at $4^{o}C$ shall be considered preserved if they are received at a temperature from above their freezing point to $6^{o}C$.

b. Samples requiring thermal preservation at $4^{o}C$ shall be considered preserved if they are received surrounded by ice.

Note: The preservation status of the samples may be recorded as "received on ice" only if solid ice is present around samples when they are received at the laboratory. The preservation status of samples refrigerated with ice packs, such as "blue ice", should not be recorded as "received on ice".

c. When multiple samples requiring thermal preservation at $4^{o}C$ are received in the same cooler or holding container, the entire set of samples shall be considered preserved if the temperature of a blank or a sample is determined to be from above freezing to $6^{o}C$, or if there is ice remaining in the shipment container.

d. Samples to be analyzed for whole effluent toxicity shall be considered preserved if their temperature on receipt is above freezing and does not exceed 10°C.

e. Samples other than whole effluent toxicity samples requiring thermal preservation at a temperature other than 4°C shall be considered preserved if their temperature on receipt is within plus or minus 2 degrees of the required preservation temperature.

2. The pH of samples that require chemical preservation, unless the laboratory has documented arrangements with sample collectors to perform chemical preservation and the collector attests in writing to the laboratory that it has preserved samples in accordance with regulations and laboratory instructions.

a. The pH of samples that require chemical preservation shall be verified with narrow range pH paper for all samples on receipt, except those that will be analyzed for volatile organic compounds and oil and grease.

b. The pH of samples to be analyzed for volatile organic compounds and oil and grease shall be verified with narrow range pH paper at the time of analysis.

(c) Samples that can be received by the laboratory within 15 minutes of collection may be transported to the laboratory without thermal or chemical preservation as long as the laboratory preserves samples within 15 minutes of their collection, or initiates analyses, for tests that only require thermal preservation, within 15 minutes of collection. The laboratory shall document that the samples have been preserved or analyzed within 15 minutes of collection.

(d) The laboratory shall proceed with analysis, rejection or qualification of results of samples received without required preservation in accordance with the laboratory's sample acceptance policy.

(e) The laboratory shall apply evidentiary chain of custody procedures when it receives samples that support regulatory investigations or when clients request it.

(f) The laboratory shall document the receipt and condition of all samples in chronological hard copy or electronic records. The records may be maintained in any format that retains the following information:

1. The identity of the client or entity submitting samples, or the project associated with the received samples.

2. The date of laboratory receipt.

3. The time of laboratory receipt for samples to be analyzed for tests with holding times equal to or less than 48 hours.

4. The time of laboratory receipt for samples preserved at the laboratory within 15 minutes of collection.

5. The unique sample identification code assigned by the laboratory.

6. The identity of the person determining the preservation status and verifying other sample conditions on receipt.

7. An unequivocal link between the sample identification code assigned by the laboratory and the field collection identification code assigned by the collector.

8. The date of sample collection.

9. The time of sample collection for samples to be analyzed for tests with holding times equal to or less than 48 hours.

10. The time of sample collection for samples preserved at the laboratory within 15 minutes of collection.

11. The requested analyses.

12. The reference to requested test methods, when the collector or sample originator specifies them.

13. Any comments resulting from the inspection undertaken to determine whether samples meet the policy in sub. (2).

(4) STORAGE OF SAMPLES. (a) The laboratory shall have procedures and appropriate facilities for avoiding deterioration, contamination, loss or damage of samples during storage.

(b) Samples requiring thermal preservation at temperatures other than $4^{o}C$ shall be stored under refrigeration within 2 degrees of the specified preservation temperature.

(c) Samples requiring thermal preservations at $4^{o}C$ may be stored at temperatures from above their freezing point to $6^{o}C$.

(d) Samples shall be stored separately from all standards, reagents, food and other potentially contaminating sources. Samples shall be stored in areas that prevent or minimize cross-contamination.

(e) Sample extracts, digestates, leachates or concentrates shall be stored as specified in this subsection.

NR 149.47 Laboratory test reports. (1) GENERAL PROVISIONS, FORMAT AND CONTENT. (a) The results of each test performed by a laboratory shall be reported in accordance with any requirements or instructions specified in approved methods or by the department.

(b) Laboratory test reports shall have formats that facilitate conveying or reviewing the content elements specified in this section, unless otherwise provided by pars. (c), (d) and (e). Content elements may be presented in narrative, tabular, schematic or graphical form, in hard copy or electronic media.

(c) When tests are performed for internal clients, or when a laboratory has a written agreement with a client, laboratory reports may be issued by the laboratory without all the content elements specified in this section. However, the laboratory shall retain and make available to the department, upon request, records that include the content elements specified in this section.

(d) Laboratories that are operated by a facility whose function is to provide data to monitor the facility's compliance with department programs covered by this chapter shall retain and make available to the department, upon request, records that include the content elements specified in this section. Laboratory reports with all the content elements specified in this section are not required to be issued if:

1. The laboratory is responsible for preparing regulatory reports in a specified format to the department.

2. The laboratory provides information to another individual within the facility for preparation of regulatory reports in a specified format to the department.

(e) Unless otherwise specified by department programs that receive data on behalf of facilities, directly from laboratories, or when provided by pars. (c) and (d), test reports from laboratories shall include at least the following information:

1. The name, address and telephone of the laboratory where tests were performed, as well as the name of a contact.

2. The laboratory's certification or registration identification number.

3. The name and address of the client or entity whose samples were analyzed.

4. The sample codes or identifiers provided by the client or collector.

5. Identification of or reference to the methods used for analysis.

6. The collection date of the samples.

7. The date of receipt of the samples.

8. For samples submitted to pretreatment steps, such as digestions or extractions, with identified holding times in department regulations, the date in which the steps were performed.

9. The date of analysis.

10. Results of analyses with their respective measurement and reporting units.

a. For sample results requiring adjustment for dilutions, the dilution factors.

b. For sample results reported on a dry weight basis, the solids content and a statement or flag indicating that results have been adjusted for the solids content of the corresponding samples.

11. For tests for which the department requires reporting to the limit of detection, the limits of detection and quantitation of the associated results.

a. For sample results requiring adjustment for dilutions, an indication of whether the detection and quantitation limits have been adjusted for the corresponding sample dilutions.

b. For sample results reported on a dry weight basis, an indication of whether the detection and quantitation limits have been adjusted for the solids content of the corresponding samples.

12. The names and signatures of responsible parties authorizing reported results.

13. Descriptions of any deviations encountered by the laboratory from chapter requirements or procedures referenced in approved methods, when the deviations affect the validity or the defensibility of reported results.

a. Description of these deviations may be communicated through narratives, flags or qualifiers.

b. When flags or qualifiers are used to declare these deviations, the laboratory shall include with or reference in the report a key to describe the meaning of all used flags and qualifiers.

14. The date of the test report.

(2) AMENDMENTS TO LABORATORY TEST REPORTS. (a) Amendments to test reports already issued by a laboratory shall be made by an authorized laboratory representative in a manner that clearly identifies the reasons for the amendment and that references the original laboratory test report.

(b) Amended reports shall comply with the requirements of this section.

(3) TEST RESULTS OBTAINED FROM SUBCONTRACTORS. (a) When reports contain results of tests performed by subcontractors, the associated results shall be identified with the subcontractors' facility identification codes.

(b) Subcontractors shall provide upon request of the originating laboratory or the department all the information contained in this section.

NR 149.48 Quality control requirements for chemical testing. (1) GENERAL REQUIREMENTS. (a) Laboratories shall establish a quality control program that through the analysis of appropriate samples, such as

method blanks, laboratory control samples, matrix spikes, matrix spike duplicates, replicates, surrogate spikes and analytical protocols, such as detection limit studies and confirmatory techniques, assesses all of the following:

1. The level of background contamination associated with the preparation and analysis of all samples.

2. The sensitivity of all tests performed.

3. The level of control of an entire analytical system.

4. The bias contributed to sample results by all preparation and analysis steps.

5. The reproducibility of test results.

6. The selectivity of test methods.

(b) Laboratories shall review at least annually the acceptability criteria specified in this section for all quality control samples and measures, and update the criteria whenever the performance characteristics of any of these samples and measures change.

(c) Laboratories may evaluate results of laboratory control samples, matrix spikes, matrix spike duplicates, sample replicates and surrogate spikes against acceptance criteria generated by the laboratory when the criteria are stricter than that published by the department or contained in approved methods of analysis.

(d) Laboratories shall fortify all required quality control samples using standards from a source different from the one used to establish initial and continuing calibrations, unless laboratories analyze additional known quality control samples specified in sub. (8).

(e) Laboratories may not adjust or correct the sample results by the recoveries of associated laboratory control samples, matrix spikes and surrogates, unless a method or project plan approved by the department requires it. Laboratories may not subtract analyte concentrations found in method blanks from sample results unless a method or project plan approved by the department requires it.

(f) Laboratories shall establish procedures for identifying and documenting preparation batches that facilitate determining compliance with the frequencies of quality control samples required by this subchapter.

(2) LIMITS OF DETECTION AND QUANTITATION. (a) Laboratories shall determine the limit of detection for all tests performed and for all analytes reported except for:

1. Biochemical oxygen demand.

2. Tests for which analyzing a fortified sample is impossible.

3. Titrimetric tests.

4. Gravimetric tests, other than oil and grease as hexane extractable materials.

(b) Laboratories shall determine the limit of detection of an analyte by a protocol established by regulation or as referenced in approved methods of analysis. All sample-processing steps of a test method shall be included in the determination of a limit of detection.

(c) For tests for which this chapter does not require performing a limit of detection, laboratories shall establish estimates of a test's sensitivity based on the intended use of the data for a given application.

(d) Limits of detection shall be determined at least annually unless a laboratory can verify the continued applicability of a previously determined limit of detection by an established and defensible protocol.

(e) Limits of detection shall be determined each time there is a change in a test method or instrumentation that affects the sensitivity of an analysis.

(f) Laboratories shall establish procedures to relate limits of detection to limits of quantitation.

(g) Established limits of quantitation shall be above determined limits of detection.

(3) METHOD BLANK. (a) Method blanks shall be processed along with and under the same conditions, including all sample preparation steps, as the associated samples in a preparation batch.

Note: Method blanks are not appropriate or required for analysis of pH, alkalinity, conductivity and solids determinations.

(b) Method blanks shall be processed at a frequency of at least one per preparation batch. When samples are analyzed by methods that do not require a preparation step before analysis, a blank, different from a calibration blank, shall be analyzed at the frequency of one per analytical batch.

(c) Whenever a method blank contains analytes of interest above the detection limit of an analysis, the laboratory shall evaluate the nature of the interference and its effect on each sample in a preparation batch.

(d) A sample in a batch shall be reanalyzed or qualified if the concentration of an analyte of interest in the associated method blank exceeds the highest of any of the following:

1. The limit of detection.

2. Five percent of the regulatory limit for that analyte.

3. Ten percent of the measured concentration in the sample.

(4) LABORATORY CONTROL SAMPLES. (a) Unless otherwise exempted by this subsection, a laboratory control sample shall be processed at a frequency of at least one sample per preparation batch, along with and under the same conditions as the associated samples in a preparation batch. These conditions shall include all sample preparation steps, except waste characteristic extractions.

Note: Waste characteristic samples are fortified after the extraction is completed.

(b) Laboratory control samples for the biochemical oxygen demand and carbonaceous biochemical oxygen demand tests shall be fortified with a mixture of glucose and glutamic acid as specified in approved methods of analysis.

(c) Laboratory control samples are not required to be processed for tests for which analyzing a fortified sample is impossible or impractical, or when a laboratory follows par. (e).

Note: Laboratory control samples need not be analyzed for the following tests: pH, solids determinations, chlorophyll a, color, odor, oil and grease as freon extractable material.

(d) When samples are analyzed by methods that do not require a preparation step before analysis, a laboratory control sample, different from a calibration standard, shall be analyzed at a frequency of one per analytical batch.

(e) Matrix spikes or certified reference materials may be processed for all reported analytes at this frequency in place of laboratory control samples, if the acceptance criteria for corresponding laboratory control samples are used to evaluate the matrix spikes and the laboratory takes the corrective action required in this subsection when matrix spikes fail established laboratory control sample acceptance criteria.

(f) For analyses of polychlorinated biphenyls, the laboratory shall fortify a laboratory control sample with at least one Aroclor per preparation batch. For other tests that determine analytes with responses that encompass

more than one chromatographic peak, as in the case of toxaphene and chlordane, the laboratory may fortify a laboratory control sample with a single multi-peak analyte per preparation batch. The laboratory shall ensure that all multi-peak analytes detectable by a method are fortified in laboratory control samples at least once every year that any of those analytes are reported.

(g) The laboratory shall compute the recovery of each fortified analyte in a laboratory quality control sample. The laboratory shall evaluate the results of laboratory control samples against acceptance criteria published by the department, or when the department has not published acceptance criteria, against all of the following:

1. Criteria contained in approved methods of analysis.

2. Laboratory generated acceptance criteria when approved methods of analysis do not contain acceptance criteria.

3. Criteria specified in project quality plans approved by the department.

(h) When laboratory control samples do not meet acceptance criteria, the laboratory shall reprocess or reanalyze all samples associated with the failing laboratory control samples or qualify the results of all samples in the preparation batch.

(i) Laboratories may process and analyze replicate laboratory control samples to establish a measure of the ability of an analytical system, independent of matrix effects, to reproduce results. The laboratory may reprocess or reanalyze all samples, or qualify the results of all samples in a preparation batch, if the relative percent difference of laboratory sample control duplicates exceeds criteria established by the laboratory.

(5) MATRIX SPIKES AND MATRIX SPIKE DUPLICATES. (a) Matrix spikes and matrix spike duplicates corresponding to the quality system matrix to which collected samples are assigned shall be processed and analyzed, unless as allowed in par. (6) (a), when:

1. Mandated test methods require their analysis and a sufficient volume or amount of sample has been received to permit their analysis.

2. Project plans require their analysis.

3. They are used in place of laboratory control samples to evaluate the level of control of an analytical system.

Note: Matrix spikes need not be analyzed for the following tests: biochemical oxygen demand, carbonaceous biochemical oxygen demand, pH, solids determinations, alkalinity, acidity, chlorophyll a, color, odor, oil and grease as freon extractable material.

(b) When required to be analyzed by par. (a), matrix spikes and matrix spike duplicates shall be:

1. Processed along with and under the same conditions as the associated samples in a preparation batch. These conditions shall include all sample preparation steps, except waste characteristic extractions.

Note: Waste characteristic samples are fortified after the extraction is completed.

2. Processed and analyzed at a frequency of one per preparation batch of samples consisting of the same quality system matrix or at frequency specified by a project plan or client agreement.

3. Fortified with the analytes specified in approved methods, project plans, client agreements, or with all reported analytes, except as allowed in sub. (4) (f).

4. Fortified with all reported analytes when matrix spikes are used in place of laboratory control samples.

(c) The laboratory shall compute the recovery of each fortified analyte in a matrix spike and matrix spike duplicate, and the relative percent difference or absolute difference of each fortified analyte in a matrix spike and matrix spike duplicate pair. The laboratory shall evaluate the recoveries, and the relative percent difference or absolute range against acceptance criteria published by the department, or when the department has not published criteria, against:

1. Criteria contained in approved methods of analysis.

2. Laboratory generated acceptance criteria when approved methods of analysis do not contain acceptance criteria.

3. Criteria specified in documented and approved project quality plans or client agreements.

(d) When matrix spikes or matrix spike duplicates do not meet acceptance criteria, the laboratory shall reprocess, reanalyze or qualify the results of the chosen fortified sample in the preparation batch. When the laboratory determines that the failure of matrix spikes or matrix spike duplicates has affected other samples in the same preparation batch, the laboratory shall reprocess or reanalyze the samples, or qualify their results.

(6) SAMPLE REPLICATES. (a) Sample replicates may be analyzed in place of matrix spike duplicates when there is a high probability that a replicate pair will contain the analytes of interest at or above the limit of quantitation of an analysis.

(b) Sample replicates corresponding to the quality system matrix to which collected samples are assigned, shall be processed and analyzed when:

1. Mandated test methods require their analysis and a sufficient volume or amount of sample has been collected or received to permit their analysis.

2. Project plans require their analysis.

3. Clients, by agreement with a laboratory, require their analysis.

(c) When required to be analyzed by par. (b), sample replicates shall be:

1. Processed along with and under the same conditions, including all sample preparation steps, as the associated samples in a preparation batch.

2. Processed and analyzed at a frequency of one per preparation batch of samples consisting of the same quality system matrix or at a frequency specified by a project plan or client agreement.

(d) The laboratory shall compute the relative percent difference or absolute difference of each pair of sample replicates. The laboratory shall evaluate these results against acceptance criteria published by the department, or when the department has not published acceptance criteria, against:

1. Criteria contained in approved methods of analysis.

2. Laboratory generated acceptance criteria when approved methods of analysis do not contain acceptance criteria.

3. Criteria specified in documented and approved project quality plans, or client agreements.

(e) When sample replicates do not meet acceptance criteria, the laboratory shall reprocess, reanalyze or qualify the results of the chosen sample analyzed in replicate in the preparation batch. When the laboratory determines that the failure of sample replicates has affected other samples in the same preparation batch, the laboratory shall reprocess or reanalyze the samples or qualify their results.

(7) SURROGATE SPIKES. (a) Surrogate compounds specified in approved methods of analysis or documented and approved project plans shall be added to all samples in a preparation batch, including method blanks, laboratory control samples, matrix spikes, matrix spike duplicates and replicates.

(b) The laboratory shall compute the recovery of all surrogates added to each sample in a preparation batch. The laboratory shall evaluate these results against acceptance criteria published by the department, or when the department has not published acceptance criteria, against:

1. Criteria contained in approved methods of analysis.

2. Laboratory generated acceptance criteria when approved methods of analysis do not contain acceptance criteria.

3. Criteria specified in documented and approved project quality plans or client agreements.

(c) When surrogate recoveries do not meet acceptance criteria, the laboratory shall determine whether the failures are the result of matrix interference. If the failures result from matrix interference, the laboratory shall qualify the results of the affected samples. If the failures cannot be attributed to matrix interference, the laboratory shall reprocess and reanalyze the affected samples or qualify sample results.

(8) ADDITIONAL QUALITY CONTROL SAMPLES. (a) Laboratories that do not use second source standards to verify the accuracy of initial calibrations or to fortify laboratory control samples, matrix spikes and matrix spike duplicates, shall analyze known quality control samples 3 times per year at evenly spaced intervals for all certified or registered analytes determined by tests amenable to fortification, and for which known quality control samples are commercially available.

Note: Analysis of known quality control samples are not required for tests, such as pH, which are performed using instruments calibrated by tuning them to conform to a universally accepted scientific law or scale. These tests are also exempt from initial calibration verification with a second source standard.

(b) Laboratories shall evaluate the results of known quality control samples against the acceptance criteria supplied by the provider. If the results of known quality control samples exceed the acceptance limits issued by a provider, the laboratory shall take corrective action and demonstrate within 30 days, through analysis of another known quality control sample or processed second source standard, the effectiveness of the corrective action taken.

(9) SELECTIVITY. (a) The laboratory shall establish procedures to confirm the results of organic analytes determined by techniques that, unlike mass spectrometry, do not provide a positive unique identification when:

1. The history of a sample source does not suggest the likely presence of the detected analyte.

2. A client or approved project plan requires it.

(b) The laboratory shall establish procedures and rules for reporting results for samples analyzed by dual column and dual detector systems that declare:

1. Under what conditions a presumptive identification is confirmed.

2. Under what conditions a presumptive identification is reported.

3. The value that will be reported when the dual systems both provide quantitative confirmed results.

(c) The laboratory shall develop and document acceptance criteria for chromatographic retention time windows.

(d) The laboratory shall document acceptance criteria for mass spectral tuning.

NR 149.49 Quality control requirements for whole effluent toxicity testing. (1) ACUTE AND CHRONIC WHOLE EFFLUENT TOXICITY TESTING BY SPECIES. Laboratories analyzing whole effluents for acute and chronic toxicity for a given species shall follow the quality control requirements referenced in the "State of Wisconsin Aquatic Life Toxicity Testing Methods Manual", 2nd edition.

(2) CHEMICAL TESTING IN SUPPORT OF WHOLE EFFLUENT TOXICITY TESTING. Laboratories performing tests for alkalinity, ammonia, hardness, pH, conductivity, dissolved oxygen and total residual chlorine shall follow the quality control requirements specified in s. NR 149.48 except that laboratories need not analyze matrix spikes or matrix spike duplicates for ammonia, and hardness.

APPENDIX I
ANALYTICAL TECHNIQUES, ANALYTES AND ANALYTE GROUPS FOR CERTIFICATION AND REGISTRATION IN THE AQUEOUS AND SOLID MATRICES

TABLE 1
COLORIMETRIC OR NEPHELOMETRIC

Analytical Technique	Class	Analyte
Colorimetric or Nephelometric		
	Demand	
		Chemical Oxygen Demand
	Metals	
		Aluminum
		Arsenic
		Beryllium
		Boron
		Cadmium
		Chromium, Hexavalent
		Chromium, Total
		Copper
		Iron
		Lead
		Magnesium
		Manganese
		Nickel
		Potassium
		Silicon
		Silver
		Zinc
	Nutrients	
		Ammonia
		Kjeldahl Nitrogen, Total
		Nitrate + Nitrite
		Nitrate
		Nitrite
		Orthophosphate
		Phosphorus, Total
	Pesticides, N-methyl Carbamates and Substituted Ureas	
		Busan 40
		Busan 85
		Carbam–S
		Dazomet
		KN Methyl
		Nabam

Analytical Technique	Class	Analyte
Colorimetric or Nephelometric		
		Ziram
	Pesticides, Not Otherwise Specified	
		Vapam
	Wet Chemistry	
		Chloride
		Chlorine, Total Residual
		Chlorophyll
		Cyanide, Amenable
		Cyanide, Total
		Fluoride
		Hardness, Total as $CaCO_3$
		Phenolics, Total
		Silica
		Sulfate
		Sulfide
		Sulfide
		Sulfite
		Surfactants
		Turbidity

TABLE 2
COMBUSTION OR OXIDATION

Analytical Technique	Class	Analyte
Combustion or Oxidation		
	Wet Chemistry	
		Adsorbable Organic Halides (AOX)
		Organic Carbon, Total (TOC)
		Organic Halides, Total (TOX)

TABLE 3
COLD VAPOR ATOMIC ABSORPTION OR GASEOUS HYDRIDE SPECTROPHOTOMETRY

Analytical Technique	Class	Analyte
Cold Vapor Atomic Absorption or Gaseous Hydride Spectrophotometry		
	Metals	
		Antimony
		Arsenic
		Mercury
		Selenium

TABLE 4
ELECTROMETRIC ASSAYS

Analytical Technique	Class	Analyte
Electrometric Assays		
	Demand	
		Biochemical Oxygen Demand
		Carbonaceous BOD
		Oxygen, Dissolved
	Nutrients	
		Ammonia as N
		Kjeldahl Nitrogen, Total
		Nitrate
	Wet Chemistry	
		Bromide
		Chloride
		Chlorine, Total Residual
		Cyanide, Total
		Fluoride
		Fluoride
		Organic Halides, Extractable (EOX)
		Organic Halides, Purgeable (POX)
		pH
		Specific Conductance
		Sulfide

TABLE 5
FLAME ATOMIC ABSORPTION SPECTROPHOTOMETRY

Analytical Technique	Class	Analyte
Flame Atomic Absorption Spectrophotometry		
	Metals	
		Aluminum
		Antimony
		Barium
		Beryllium
		Cadmium
		Calcium
		Chromium, Hexavalent
		Chromium, Total
		Cobalt
		Copper
		Gold
		Iridium

Analytical Technique	Class	Analyte
Flame Atomic Absorption Spectrophotometry		
		Iron
		Lead
		Lithium
		Magnesium
		Manganese
		Molybdenum
		Nickel
		Osmium
		Palladium
		Platinum
		Potassium
		Rhodium
		Ruthenium
		Silver
		Sodium
		Strontium
		Thallium
		Tin
		Titanium
		Vanadium
		Zinc
	Wet Chemistry	
		Hardness, Total as $CaCO_3$

TABLE 6
GAS CHROMATOGRAPHY

Analytical Technique	Class	Analyte or Analyte Group
Gas Chromatography		
	Base, Neutral, and Acid Extractable Semivolatiles, Aldehydes and Ketones	
		2-Butanone (Methyl Ethyl Ketone)
		Crotonaldehyde
		2-Hexanone
		4-Methyl-2-pentanone (Methyl Isobutyl Ketone)
		Paraldehyde
		2-Pentanone
	Base, Neutral, and Acid Extractable Semivolatiles, Benzidines	
		Benzidine
		3,3'-Dichlorobenzidine
		3,3'-Dimethoxybenzidine
		3,3'-Dimethylbenzidine
	Base, Neutral, and Acid Extractable Semivolatiles, Chlorinated Hydrocarbons	
		1,2-Dibromo-3-chloropropane (DBCP)
		Benzyl Chloride
		Chloroprene
		Hexachlorobenzene
		Hexachlorobutadiene

Analytical Technique	Class	Analyte or Analyte Group
Gas Chromatography		
		Hexachlorocyclopentadiene
		Hexachloroethane
		Pentachlorobenzene
		1,2,4,5-Tetrachlorobenzene
	Base, Neutral, and Acid Extractable Semivolatiles, Explosive Residues	
		1,3-Dinitrobenzene
		2,4-Dinitrophenol
		2,4-Dinitrotoluene
		2,6-Dinitrotoluene
		Nitrobenzene
		1,3,5-Trinitrobenzene
	Base, Neutral, and Acid Extractable Semivolatiles, Haloethers	
		Bis(2-chloroethoxy)methane
		Bis(2-chloroethyl) ether
		Bis(2-chloroisopropyl) ether
		4-Bromophenyl phenyl ether
		2,2-Oxybis(1-chloropropane)
	Base, Neutral, and Acid Extractable Semivolatiles, Nitroaromatics and Cyclic Ketones	
		Isophorone
		Nitrobenzene
	Base, Neutral, and Acid Extractable Semivolatiles, Nitrosamines	
		N-Nitrosodiethylamine
		N-Nitrosodimethylamine
		N-Nitrosodi-n-butylamine
		N-Nitrosodi-n-propylamine
		N-Nitrosodiphenylamine
		N-Nitrosodipropylamine
		N-Nitrosomethylethylamine
		N-Nitrosomorpholine
		N-Nitrosopiperidine
		N-Nitrosopyrrolidine
	Base, Neutral, and Acid Extractable Semivolatiles, Nonhalogenated Organics	
		Acetonitrile
		Acrolein
		Acrylonitrile
		Allyl Alcohol
		Allyl Chloride
		n-Butyl Alcohol (1-Butanol)
		t-Butyl Alcohol
		Diethyl Ether
		Diethylene Glycol
		Ethanol
		Ethyl Acetate
		Ethyl Methacrylate
		Ethylene Glycol
		Ethylene Oxide
		Hexafluoro-2-methyl-2-propanol

Analytical Technique	Class	Analyte or Analyte Group
Gas Chromatography		
		Hexafluoro-2-propanol
		Isobutyl alcohol (2-Methyl-1-propanol)
		Isopropyl alcohol (2-Propanol)
		Methacrylonitrile
		Methanol
		Methyl Methacrylate
		2-Picoline (2-Methylpyridine)
		1-Propanol
		Propionitrile (Ethyl Cyanide)
		Pyridine
		o-Toluidine
	Base, Neutral, and Acid Extractable Semivolatiles, Phenols	
		4-Chloro-3-methylphenol
		2-Chlorophenol
		p-Chloro-m-cresol
		2,4-Dichlorophenol
		2,4-Dimethylphenol
		2-Methyl-4,6-dinitrophenol
		2-Nitrophenol
		4-Nitrophenol
		Pentachlorophenol
		Phenol
		2,4,5-Trichlorophenol
		2,4,6-Trichlorophenol
	Base, Neutral, and Acid Extractable Semivolatiles, Phthalate Esters	
		Benzyl Butyl Phthalate
		Bis(2-ethylhexyl)phthalate
		Diethyl Phthalate
		Dimethyl Phthalate
		Di-n-butyl Phthalate
		Di-n-octyl Phthalate
	Pesticides, Acid Herbicides	
		Acifluorfen
		Chloramben
		2,4-D
		2,4-DB
		2,4–DB Salts and Esters
		Dacthal (DCPA)
		Dichlorprop Salts and Esters
		Dinoseb
		MCPA Salts and Esters
		MCPP Salts and Esters
		Picloram
		2,4,5-T
		2,4,5-TP (Silvex)
	Pesticides, Nitrogen	
		Alachlor
		Ametryn

Analytical Technique	Class	Analyte or Analyte Group
Gas Chromatography		
		Aspon
		Benfluralin
		Bentazon
		Bromacil Salts and Esters
		Bromoxynil Octanoate
		Butachlor
		Chlorothalonil
		Dalapon
		Diazinon
		Dicamba
		Ethalfluralin
		Fenarimol
		Isopropalin
		Metribuzin
		Norflurazon
		Pendimethalin
		Pronamide
		Propachlor
		Propanil
		Triadimefon
		Trifluralin
	Pesticides, N-Methyl Carbamates and Substituted Ureas	
		Barban
		Busan 41
		Busan 85
		Carbam–S
		Carbaryl
		Carbofuran
		Dazomet
		Diallate (cis or trans)
		Ethyl Carbamate
		KN Methyl
		Mexacarbate
		Nabam
		Nabonate
		Sulfallate
		Tebuthiuron
		Terbacil
		Ziram
	Pesticides, Organochlorine	
		Pesticides, Organochlorine Analyte Group
		Aldrin
		alpha-BHC
		beta-BHC
		delta-BHC
		gamma-BHC (Lindane)
		Captafol
		Captan

Analytical Technique	Class	Analyte or Analyte Group
Gas Chromatography		
		Chlordane
		Chloroneb
		4,4'-DDD
		4,4'-DDE
		4,4'-DDT
		Dichloran
		Dieldrin
		Endosulfan I
		Endosulfan II
		Endosulfan Sulfate
		Endrin
		Endrin Aldehyde
		Heptachlor
		Heptachlor Epoxide
		Isodrin
		Kepone
		Methoxychlor
		Mirex
		Pentachloronitrobenzene (PCNB)
		Perthane
		Strobane
		Toxaphene
	Pesticides, Organophosphorus	
		Acephate
		Azinphos Ethyl
		Azinphos Methyl
		Bolstar
		Carbophenothion
		Chlorfenvinphos
		Chlorpyrifos
		Chlorpyrifos Methyl
		Coumaphos
		Crotoxyphos
		DEF
		Demeton-O
		Demeton-S
		Diazinon
		Dichlofenthion
		Dichlorvos
		Dicrotophos
		Dimethoate
		Dioxathion
		Disulfoton
		EPN
		Ethion
		Ethoprop
		Famphur
		Fenitrothion

Analytical Technique	Class	Analyte or Analyte Group
Gas Chromatography		
		Fensulfothion
		Fenthion
		Fonophos
		Hexamethylphosphoramide
		Leptophos
		Malathion
		Merphos
		Methamidophos
		Mevinphos
		Monocrotophos
		Naled
		Parathion (Parathion Ethyl)
		Parathion Methyl
		Phorate
		Phosalone
		Phosmet
		Phosphamidon
		Ronnel
		Stirofos
		Sulfotepp
		TEPP
		Thionazin (Zinophos)
		Tokuthion (Protothiofos)
		Trichloronate
		Trichlorphon
		Tri-o-cresylphosphate (TOCP)
		Terbufos
		Tetrachlorvinphos
	Pesticides, Triazines	
		Atrazine
		Atraton
		Cyanazine
		Deisopropylatrazine
		Desethylatrazine
		Diaminoatrazine
		Prometon
		Prometryn
		Propazine
		Simazine
		Terbuthylazine
		Terbutryn
	Pesticides, Not Otherwise Specified	
		Permethrin
		Vapam
	Petroleum Hydrocarbons	
		Diesel Range Organics (DRO)
		Gasoline Range Organics (GRO)
		Petroleum Volatile Organic Compounds (PVOCs)

Analytical Technique	Class	Analyte or Analyte Group
Gas Chromatography		
	Polychlorinated Biphenyls as Aroclors	
		Polychlorinated Biphenyls as Aroclors Analyte Group
		Aroclor 1016
		Aroclor 1221
		Aroclor 1232
		Aroclor 1242
		Aroclor 1248
		Aroclor 1254
		Aroclor 1260
	Polychlorinated Biphenyl Congeners	
		Polychlorinated Biphenyl Congeners Analyte Group
		2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl
		2,2',3,3',4,4',5-Heptachlorobiphenyl
		2,2',3,4,4',5,5'-Heptachlorobiphenyl
		2,2',3,4,4',5',6-Heptachlorobiphenyl
		2,2',3,4,4',5'-Hexachlorobiphenyl
		2,2',3,4',5,5',6-Heptachlorobiphenyl
		2,2',3,4,5,5'-Hexachlorobiphenyl
		2,2',3,4,5'-Pentachlorobiphenyl
		2,2',3,5,5',6-Hexachlorobiphenyl
		2,2',3,5'-Tetrachlorobiphenyl
		2,2',4,4',5,5'-Hexachlorobiphenyl
		2,2',4,5,5'-Pentachlorobiphenyl
		2,2',5,5'-Tetrachlorobiphenyl
		2,2',5-Trichlorobiphenyl
		2,3,3',4',6-Pentachlorobiphenyl
		2,3',4,4'-Tetrachlorobiphenyl
		2,3-Dichlorobiphenyl
		2,4',5-Trichlorobiphenyl
		Chlorobiphenyl
	Polynuclear Aromatic Hydrocarbons	
		Polynuclear Aromatic Hydrocarbons Analyte Group
		Acenaphthene
		Acenaphthylene
		Anthracene
		Benzo(a)anthracene
		Benzo(a)pyrene
		Benzo(b)fluoranthene
		Benzo(g,h,i)perylene
		Benzo(k)fluoranthene
		Chrysene
		Dibenzo(a,h)anthracene
		Fluoranthene
		Fluorene
		Indeno(1,2,3-cd)pyrene
		Naphthalene
		Phenanthrene

Analytical Technique	Class	Analyte or Analyte Group
Gas Chromatography		
		Pyrene
	Volatile Organic Compounds	
		Volatile Organic Compounds Analyte Group
		Acetone
		Benzene
		Bromoacetone
		Bromobenzene
		Bromochloromethane
		Bromodichloromethane
		Bromoform
		Bromomethane
		n-Butylbenzene
		sec-Butylbenzene
		tert-Butylbenzene
		Carbon Tetrachloride
		Chlorobenzene
		Chloroethane
		2-Chloroethyl Vinyl Ether
		Chloroform
		Chloromethane
		Chloromethyl Methyl Ether
		2-Chloronaphthalene
		2-Chlorotoluene
		4-Chlorotoluene
		Dibromochloromethane
		Dibromomethane (EDB)
		1,2-Dichlorobenzene
		1,3-Dichlorobenzene
		1,4-Dichlorobenzene
		Dichlorobromomethane
		1,1-Dichloroethane
		1,2-Dichloroethane
		cis-1,2-Dichloroethene
		trans-1,2-Dichloroethene
		1,2-Dichloropropane
		1,3-Dichloropropane
		2,2-Dichloropropane
		1,3-Dichloro-2-propanol
		1,1-Dichloropropene
		cis-1,3-Dichloropropene
		trans-1,3-Dichloropropene
		2,3-Dichloropropene
		Dichlorodifluoromethane
		1,4-Dioxane
		Epichlorohydrin
		Ethylbenzene
		Isopropylbenzene
		p-Isopropyltoluene

Analytical Technique	Class	Analyte or Analyte Group
Gas Chromatography		
		Methyl Bromide
		Methyl Chloride
		Methyl Iodide
		Methyl tert-Butyl Ether
		Methylene Bromide
		Methylene Chloride
		n-Propylbenzene
		Styrene
		Tetrachloroethene
		Toluene
		1,1,1,2-Tetrachloroethane
		1,1,2,2-Tetrachloroethane
		1,2,3-Trichlorobenzene
		1,2,4-Trichlorobenzene
		1,1,1-Trichloroethane
		1,1,2-Trichloroethane
		Trichloroethene
		Trichlorofluoromethane
		1,2,3-Trichloropropane
		1,2,4-Trimethylbenzene
		1,3,5-Trimethylbenzene
		m-Xylene
		o-Xylene
		p-Xylene
		Vinyl Chloride

TABLE 7
GAS CHROMATOGRAPHY-MASS SPECTROMETRY

Analytical Technique	Class	Analyte
Gas Chromatography/Mass Spectrometry		
		Base/Neutral/Acid Extractable Semivolatiles Analyte Group [1]
	Base, Neutral, and Acid Extractable Semivolatiles, Aldehydes and Ketones	
		2-Butanone (Methyl ethyl ketone)
		Crotonaldehyde
		2-Hexanone
		4-Methyl-2-pentanone (Methyl Isobutyl Ketone)
		Paraldehyde
		2-Pentanone
	Base, Neutral, and Acid Extractable Semivolatiles, Benzidines	
		Benzidine
		3,3'-Dichlorobenzidine
		3,3'-Dimethoxybenzidine
		3,3'-Dimethylbenzidine
	Base, Neutral, and Acid Extractable Semivolatiles, Chlorinated Hydrocarbons	
		Benzyl chloride

Analytical Technique	Class	Analyte
Gas Chromatography/Mass Spectrometry		
		Chlorobenzilate
		3-(Chloromethyl)pyridine Hydrochloride
		1-Chloronaphthalene
		Chloroprene
		1,2-Dibromo-3-chloropropane (DBCP)
		Hexachlorobenzene
		Hexachlorobutadiene
		Hexachlorocyclopentadiene
		Hexachloroethane
		Hexachlorophene
		Hexachloropropene
		Pentachlorobenzene
		1,2,4,5-Tetrachlorobenzene
	Base, Neutral, and Acid Extractable Semivolatiles, Explosive Residues	
		1,3-Dinitrobenzene
		2,4-Dinitrophenol
		2,4-Dinitrotoluene
		2,6-Dinitrotoluene
		Nitrobenzene
		1,3,5-Trinitrobenzene
	Base, Neutral, and Acid Extractable Semivolatiles, Haloethers	
		4-Bromophenyl Phenyl Ether
		Bis(2-chloroethoxy)methane
		Bis(2-chloroethyl)ether
		Bis(2-chloroethyl)sulfide
		Bis(2-chloroisopropyl)ether
		2,2-Oxybis(1-chloropropane)
	Base, Neutral, and Acid Extractable Semivolatiles, Nitroaromatics and Cyclic Ketones	
		4-Aminobiphenyl
		3-Amino-9-ethylcarbazole
		4-Chloroaniline
		5-Chloro-2-methylaniline
		4-Chloro-1,2-phenylenediamine
		4-Chloro-1,3-phenylenediamine
		3-Chloropropionitrile
		2,4-Diaminotoluene
		alpha,alpha-Dimethylphenethylamine
		1,2-Dinitrobenzene
		1,2-Diphenylhydrazine
		Isophorone
		4,4'-Methylenebis (2-chloroaniline)
		4,4'-Methylenebis(N,N-dimethylaniline)
		1-Naphthylamine
		2-Naphthylamine
		5-Nitroacenaphthene
		2-Nitroaniline
		3-Nitroaniline
		4-Nitroaniline

Analytical Technique	Class	Analyte
Gas Chromatography/Mass Spectrometry		
		5-Nitro-o-anisidine
		4-Nitrobiphenyl
		2-Nitropropane
		5-Nitro-o-toluidine
		4,4'-Oxydianiline
		1,4-Phenylenediamine
		2-Picoline (2-Methylpyridine)
		n-Propylamine
		2,4,5-Trimethylaniline
	Base, Neutral, and Acid Extractable Semivolatiles, Nitrosamines	
		N-Nitrosodiethylamine
		N-Nitrosodimethylamine
		N-Nitrosodi-n-butylamine
		N-Nitrosodi-n-propylamine
		N-Nitrosodiphenylamine
		N-Nitrosodipropylamine
		N-Nitrosomethylethylamine
		N-Nitrosomorpholine
		N-Nitrosopiperidine
		N-Nitrosopyrrolidine
	Base, Neutral, and Acid Extractable Semivolatiles, Nonhalogenated Organics	
		Acetonitrile
		Acetophenone
		2-Acetylaminofluorene
		1-Acetyl-2-thiourea
		Acrolein
		Acrylonitrile
		Allyl Alcohol
		Allyl Chloride
		2-Aminoanthraquinone
		Aminoazobenzene
		Aniline
		o-Anisidine
		Aramite
		Benzoic Acid
		p-Benzoquinone
		Benzyl Alcohol
		n-Butanol
		Carbazole
		Carbon Disulfide
		p-Chloroaniline
		p-Cresidine
		Dibenzofuran
		1,2,3,4-Diepoxybutane
		Diethyl Ether
		O,O-Diethyl O-2-pyrazinyl phosphorothionate
		Diethyl Sulfate
		Diethylstilbestrol

Analytical Technique	Class	Analyte
Gas Chromatography/Mass Spectrometry		
		Dihydrosaffrole
		Dimethylaminoazobenzene
		Diphenylamine
		5,5-Diphenylhydantoin
		Ethanol
		Ethyl Acetate
		Ethyl Methacrylate
		Ethyl Methanesulfonate
		Fluchloralin
		Hydroquinone
		2-Hydroxypropionitrile
		Isobutyl Alcohol (2-Methyl-1-propanol)
		Isopropyl Alcohol (2-Propanol)
		Isosafrole
		Maleic Anhydride
		Malononitrile
		Mestranol
		Methacrylonitrile
		Methanol
		Methapyrilene
		Methyl Acrylate
		Methyl Methacrylate
		Methyl Methanesulfonate
		3-Methylcholanthrene
		1,4-Naphthoquinone
		Nicotine
		Nitrofen
		4-Nitroquinoline 1-oxide
		Octamethyl Pyrophosphoramide
		Phenacetin
		Phenobarbital
		Phthalic Anhydride
		Piperonyl Sulfoxide
		Propargyl Alcohol
		ß-Propiolactone
		Propionitrile (Ethyl Cyanide)
		Propylthiouracil
		Pyridine
		Resorcinol
		Safrole
		Tetraethyl Dithiopyrophosphate
		Tetraethyl Pyrophosphate
		Thiophenol (Benzenethiol)
		Toluene Diisocyanate
		o-Toluidine
		Trimethyl Phosphate
		O,O,O-Triethyl Phosphorothioate
		Tri-p-tolyl Phosphate

Analytical Technique	Class	Analyte
Gas Chromatography/Mass Spectrometry		
		Tris(2,3-dibromopropyl) phosphate
	Base, Neutral, and Acid Extractable Semivolatiles, Phenols	
		p-Chloro-m-cresol
		4-Chloro-3-methylphenol
		2-Chlorophenol
		2-Cyclohexyl-4,6-dinitro-phenol
		2,4-Dichlorophenol
		2,6-Dichlorophenol
		2,4-Dimethylphenol
		4,6-Dinitro-2-methylphenol
		4,6-Dinitro-o-cresol
		2-Methyl-4,6-dinitrophenol
		2-Methylphenol (o-Cresol)
		3-Methylphenol (m-Cresol)
		4-Methylphenol (p-Cresol)
		2-Nitrophenol
		4-Nitrophenol
		Pentachlorophenol
		Phenol
		2,3,4,6-Tetrachlorophenol
		2,4,5-Trichlorophenol
		2,4,6-Trichlorophenol
	Base, Neutral, and Acid Extractable Semivolatiles, Phthalate Esters	
		Benzyl Butyl Phthalate
		Bis(2-ethylhexyl)phthalate
		Diethyl Phthalate
		Dimethyl Phthalate
		Di-n-butyl Phthalate
		Di-n-octyl Phthalate
	Pesticides, Nitrogen	
		Alachlor
		Ametryn
		Aspon
		Benfluralin
		Bentazon
		Bromacil Salts and Esters
		Bromoxynil Octanoate
		Butachlor
		Chlorothalonil
		Dalapon
		Diazinon
		Dicamba
		Ethalfluralin
		Fenarimol
		Isopropalin
		Metribuzin
		Norflurazon
		Pendimethalin

Analytical Technique	Class	Analyte
Gas Chromatography/Mass Spectrometry		
		Pronamide
		Propachlor
		Propanil
		Triadimefon
		Trifluralin
	Pesticides, N-Methyl Carbamates and Substituted Ureas	
		Barban
		Busan 41
		Busan 85
		Carbam–S
		Carbaryl
		Carbofuran
		Dazomet
		Diallate (cis or trans)
		Ethyl Carbamate
		KN Methyl
		Mexacarbate
		Nabam
		Nabonate
		Sulfallate
		Tebuthiuron
		Terbacil
		Ziram
	Pesticides, Organochlorine	
		Pesticides, Organochlorine Analyte Group
		4,4'-DDD
		4,4'-DDE
		4,4'-DDT
		Aldrin
		alpha-BHC
		beta-BHC
		delta-BHC
		gamma-BHC (Lindane)
		Captafol
		Captan
		Chlordane
		Dichlone
		Dieldrin
		Endosulfan I
		Endosulfan II
		Endosulfan Sulfate
		Endrin
		Endrin Aldehyde
		Endrin Ketone
		Heptachlor
		Heptachlor Epoxide
		Isodrin
		Kepone

Analytical Technique	Class	Analyte
Gas Chromatography/Mass Spectrometry		
		Methoxychlor
		Mirex
		Pentachloronitrobenzene (PCNB)
		Trifluralin
	Pesticides, Organophosphorus	
		Acephate
		Azinphos Ethyl
		Azinphos Methyl
		Bolstar
		Carbophenothion
		Chlorfenvinphos
		Chlorpyrifos
		Chlorpyrifos Methyl
		Coumaphos
		Crotoxyphos
		DEF
		Demeton-O
		Demeton-S
		Diazinon
		Dichlofenthion
		Dichlorvos
		Dicrotophos
		Dimethoate
		Dioxathion
		Disulfoton
		EPN
		Ethion
		Ethoprop
		Famphur
		Fenitrothion
		Fensulfothion
		Fenthion
		Fonophos
		Hexamethylphosphoramide
		Leptophos
		Malathion
		Merphos
		Methamidophos
		Mevinphos
		Monocrotophos
		Naled
		Parathion (Parathion Ethyl)
		Parathion Methyl
		Phosalone
		Phorate
		Phosmet
		Phosphamidon
		Ronnel

Analytical Technique	Class	Analyte
Gas Chromatography/Mass Spectrometry		
		Stirofos
		Sulfotepp
		TEPP
		Thionazin (Zinophos)
		Tokuthion (Protothiofos)
		Trichloronate
		Trichlorphon
		Tri-o-cresylphosphate (TOCP)
		Terbufos
		Tetrachlorvinphos
	Pesticides, Triazines	
		Atrazine
		Atraton
		Cyanazine
		Deisopropylatrazine
		Desethylatrazine
		Diaminoatrazine
		Prometon
		Prometryn
		Propazine
		Simazine
		Terbuthylazine
		Terbutryn
	Pesticides, Not Otherwise Specified	
		Endothall
		Strychnine
	Polychlorinated Dibenzo-p-Dioxins and Furans	
		Polychlorinated Dibenzo-p-Dioxins and Furans Analyte Group [2]
	Polychlorinated Biphenyls as Aroclors	
		Polychlorinated Biphenyls as Aroclors Analyte Group
		Aroclor 1016
		Aroclor 1221
		Aroclor 1232
		Aroclor 1242
		Aroclor 1248
		Aroclor 1254
		Aroclor 1260
	Polychlorinated Biphenyl Congeners	
		Polychlorinated Biphenyl Congeners Analyte Group
		2,6-Dichlorosyringaldehyde
		2-Chlorosyringaldehyde
		3,3'-Dichlorobiphenyl
		3,4,5-Trichlorocatechol
		3,4,5-Trichloroguaiacol
		3,4,6-Trichlorocatechol
		3,4,6-Trichloroguaiacol
		3,4-Dichlorocatechol

Analytical Technique	Class	Analyte
Gas Chromatography/Mass Spectrometry		
		3,4-Dichloroguaiacol
		3,6-Dichlorocatechol
		4,5,6-Trichloroguaiacol
		4,5-Dichlorocatechol
		4,5-Dichloroguaiacol
		4,6-Dichlorocatechol
		4,6-Dichloroguaiacol
		4-Chlorocatechol
		4-Chloroguaiacol
		4-Chlorophenol
		5,6-Dichlorovanillin
		5-Chlorovanillin
		6-Chlorovanillin
		Tetrachlorocatechol
		Tetrachloroguaiacol
		Trichlorosyringol
	Polynuclear Aromatic Hydrocarbons	
		Polynuclear Aromatic Hydrocarbons Analyte Group
		2-Methylnaphthalene
		3-Methylcholanthrene
		7,12-Dimethylbenz(a)-anthracene
		Acenaphthene
		Acenaphthylene
		Anthracene
		Benzo(a)anthracene
		Benzo(a)pyrene
		Benzo(b)fluoranthene
		Benzo(g,h,i)perylene
		Benzo(k)fluoranthene
		Chrysene
		Dibenz(a,j)acridine
		Dibenzo(a,e)pyrene
		Dibenzo(a,h)anthracene
		Fluoranthene
		Fluorene
		Indeno(1,2,3-cd)pyrene
		Naphthalene
		Phenanthrene
		Pyrene
	Volatile Organic Compounds	
		Volatile Organic Compounds Analyte Group
		Acetone
		Benzene
		Bromoacetone
		Bromobenzene
		Bromochloromethane
		Bromodichloromethane
		Bromoform

Analytical Technique	Class	Analyte
Gas Chromatography/Mass Spectrometry		
		Bromomethane
		n-Butylbenzene
		sec-Butylbenzene
		tert-Butylbenzene
		Carbon Tetrachloride
		Chlorobenzene
		Chloroethane
		2-Chloroethyl Vinyl Ether
		Chloroform
		Chloromethane
		Chloromethyl Methyl Ether
		2-Chloronaphthalene
		2-Chlorotoluene
		4-Chlorotoluene
		Dibromochloromethane
		Dibromomethane (EDB)
		1,2-Dichlorobenzene
		1,3-Dichlorobenzene
		1,4-Dichlorobenzene
		Dichlorobromomethane
		1,1-Dichloroethane
		1,2-Dichloroethane
		cis-1,2-Dichloroethene
		trans-1,2-Dichloroethene
		1,2-Dichloropropane
		1,3-Dichloropropane
		2,2-Dichloropropane
		1,3-Dichloro-2-propanol
		1,1-Dichloropropene
		cis-1,3-Dichloropropene
		trans-1,3-Dichloropropene
		2,3-Dichloropropene
		Dichlorodifluoromethane
		1,4-Dioxane
		Epichlorohydrin
		Ethylbenzene
		Isopropylbenzene
		p-Isopropyltoluene
		Methyl Bromide
		Methyl Chloride
		Methyl Iodide
		Methyl tert-Butyl Ether
		Methylene Bromide
		Methylene Chloride
		n-Propylbenzene
		Styrene
		Tetrachloroethene
		Toluene

Analytical Technique	Class	Analyte
Gas Chromatography/Mass Spectrometry		
		1,1,1,2-Tetrachloroethane
		1,1,2,2-Tetrachloroethane
		1,2,3-Trichlorobenzene
		1,2,4-Trichlorobenzene
		1,1,1-Trichloroethane
		1,1,2-Trichloroethane
		Trichloroethene
		Trichlorofluoromethane
		1,2,3-Trichloropropane
		1,2,4-Trimethylbenzene
		1,3,5-Trimethylbenzene
		m-Xylene
		o-Xylene
		p-Xylene
		Vinyl Chloride

[1] Certification or registration for Gas Chromatography/Mass Spectrometry Analytical Technique in the Base/Neutral/Acid Analyte Group is comprised of all analytes in the following classes: Base, Neutral and Acid Extractable Semivolatiles, Aldehydes and Ketones; Base, Neutral and Acid Extractable Semivolatiles, Benzidines; Base, Neutral and Acid Extractable Semivolatiles, Chlorinated Hydrocarbons; Base, Neutral and Acid Extractable Semivolatiles, Explosive Residues; Base, Neutral and Acid Extractable Semivolatiles, Haloethers; Base, Neutral and Acid Extractable Semivolatiles, Nitrosamines; Base, Neutral and Acid Extractable Semivolatiles, Nonhalogenated Organics; Base, Neutral and Acid Extractable Semivolatiles, Phenols; Base, Neutral and Acid Extractable Semivolatiles, Phthalate Esters and Polynuclear Aromatic Hydrocarbons.
[2] Certification or registration for individual Polychlorinated-p-dibenzo-Dioxins and Furans analytes in the Gas Chromatography/Mass Spectrometry Analytical Technique available upon request.

TABLE 8
GRAPHITE FURNACE ATOMIC ABSORPTION SPECTROPHOTOMETRY

Analytical Technique	Class	Analyte
Graphite Furnace Atomic Absorption Spectrophotometry		
	Metals	
		Aluminum
		Antimony
		Arsenic
		Barium
		Beryllium
		Cadmium
		Chromium, Total
		Cobalt
		Copper
		Gold
		Iridium
		Iron
		Lead
		Manganese
		Molybdenum
		Nickel
		Osmium

Analytical Technique	Class	Analyte
Graphite Furnace Atomic Absorption Spectrophotometry		
		Palladium
		Platinum
		Rhodium
		Ruthenium
		Selenium
		Silver
		Thallium
		Tin
		Titanium
		Vanadium
		Zinc

TABLE 9
GRAVIMETRIC ASSAYS

Analytical Technique	Class	Analyte
Gravimetric Assays		
	Physical	
		Oil & Grease, Freon
		Oil & Grease, Hexane Extractable Materials
		Residue, Filterable (TDS)
		Residue, Nonfilterable (TSS)
		Residue, Settleable
		Residue, Total
		Residue, Volatile (TVS)
		Residue, Volatile, Nonfilterable (TVSS)
	Wet Chemistry	
		Sulfate

TABLE 10
HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

Analytical Technique	Class	Analyte or Analyte Group
High Performance Liquid Chromatography		
	Metals	
		Mercury
		Organomercury
	Base, Neutral, and Acid Extractable Semivolatiles, Aldehydes and Ketones	
		Acetaldehyde
		Acetone
		Butanal
		Crotonaldehyde
		Cyclohexanone
		Decanal
		Heptanal

Analytical Technique	Class	Analyte or Analyte Group
High Performance Liquid Chromatography		
		Hexanal
		Isovaleraldehyde
		Nonanal
		Octanal
		o-Tolualdehyde
		Pentanal (Valeraldehyde)
		Propanal (Propionaldehyde)
		m-Tolualdehyde
		p-Tolualdehyde
	Base, Neutral, and Acid Extractable Semivolatiles, Benzidines	
		Benzidine
		3,3'-Dichlorobenzidine
	Base, Neutral, and Acid Extractable Semivolatiles, Explosive Residues	
		2-Amino-4,6-dinitrotoluene
		4-Amino-2,6-dinitrotoluene
		1,3-Dinitrobenzene
		2,4-Dinitrotoluene
		2,6-Dinitrotoluene
		HMX
		Nitrobenzene
		Nitroglycerine
		2-Nitrotoluene
		3-Nitrotoluene
		4-Nitrotoluene
		RDX
		Tetryl
		1,3,5-Trinitrobenzene
		2,4,6-Trinitrotoluene
	Base, Neutral, and Acid Extractable Semivolatiles, Nonhalogenated Organics	
		Acrolein
		Acrylamide
		Acrylonitrile
	Pesticides, Acid Herbicides	
		2,4-D
		2,4–DB Salts and Esters
		Dichlorprop Salts and Esters
		Dinoseb
		MCPA Salts and Esters
		MCPP Salts and Esters
		Pentachlorophenol
	Pesticides, N-Methyl Carbamates and Substituted Ureas	
		Aldicarb

Analytical Technique	Class	Analyte or Analyte Group
High Performance Liquid Chromatography		
		Aldicarb Sulfone
		Aminocarb
		Barban
		Benomyl
		Carbaryl
		Carbaryl
		Carbofuran
		Carbofuran
		Chloropropham
		Dioxacarb
		Diuron
		Fenuron
		Fenuron-TCA
		3-Hydroxycarbofuran
		Linuron
		Methiocarb
		Methomyl
		Mexacarbate
		Monuron
		Monuron-TCA
		Neburon
		Promecarb
		Propanil
		Propham
		Propoxur
		Siduron
		Swep
	Pesticides, Nitrogen	
		Bromoxynil
		Secbumeton
		TCMTB
	Pesticides, Not Otherwise Specified	
		Diquat
		Fenvalerate
		Glyphosate
		Paraquat
		Pyrethrin I
		Pyrethrin II
	Polynuclear Aromatic Hydrocarbons	
		Polynuclear Aromatic Hydrocarbons Analyte Group
		Acenaphthene
		Acenaphthylene

Analytical Technique	Class	Analyte or Analyte Group
High Performance Liquid Chromatography		
		Anthracene
		Benzo(a)anthracene
		Benzo(a)pyrene
		Benzo(b)fluoranthene
		Benzo(g,h,i)perylene
		Benzo(k)fluoranthene
		Chrysene
		Dibenzo(a,h)anthracene
		Fluoranthene
		Fluorene
		Indeno(1,2,3-cd)pyrene
		Naphthalene
		Phenanthrene
		Pyrene

TABLE 11
HIGH RESOLUTION GAS CHROMATOGRAPHY-HIGH RESOLUTION MASS SPECTROMETRY

Analytical Technique	Class	Analyte or Analyte Group
High Resolution Gas Chromatography/High Resolution Mass Spectrometry		
	Polychlorinated Dibenzo-p-Dioxins and Furans	
		Polychlorinated Dibenzo-p-Dioxins and Furans Analyte Group [1]
	Polychlorinated Biphenyl Congeners	
		Polychlorinated Biphenyl Congeners Analyte Group [2]

[1] Certification or registration for individual Tetra through Octa-Chlorinated Dioxins and Furans in the High Resolution Gas Chromatography/High Resolution Mass Spectrometry Analytical Technique available upon request.
[2] Certification or registration for individual Polychlorinated Biphenyl Congeners in the High Resolution Gas Chromatography/High Resolution Mass Spectrometry Analytical Technique available upon request.

TABLE 12
HIGH RESOLUTION GAS CHROMATOGRAPHY-LOW RESOLUTION MASS SPECTROMETRY

Analytical Technique	Class	Analyte or Analyte Group
High Resolution Gas Chromatography/Low Resolution Mass Spectrometry		
	Polychlorinated Dibenzo-p-Dioxins and Furans	
		Polychlorinated Dibenzo-p-Dioxins and Furans Analyte Group [1]

[1] Certification or registration for individual Tetra through Octa-Chlorinated Dioxins and Furans in the High Resolution Gas Chromatography/Low Resolution Mass Spectrometry Analytical Technique available upon request.

TABLE 13
INDUCTIVELY COUIPLED PLASMA EMISSION SPECTROPHOTOMETRY

Analytical Technique	Class	Analyte or Analyte Group
Inductively Coupled Plasma Emission Spectrophotometry		
	Metals	
		Aluminum
		Antimony
		Arsenic
		Barium
		Beryllium
		Bismuth
		Boron
		Cadmium
		Calcium
		Chromium, Total
		Cobalt
		Copper
		Gold
		Iridium
		Iron
		Lead
		Magnesium
		Manganese
		Molybdenum
		Nickel
		Osmium
		Palladium
		Platinum
		Potassium
		Rhodium
		Ruthenium
		Selenium
		Silicon
		Silver
		Sodium
		Strontium
		Thallium
		Tin
		Titanium
		Tungsten
		Vanadium
		Zinc
		Zirconium
	Wet Chemistry	
		Hardness, Total as $CaCO_3$
		Silica

TABLE 14
INDUCTIVELY COUPLED PLASMA –MASS SPECTROMETRY

Analytical Technique	Class	Analyte
Inductively Coupled Plasma-Mass Spectrometry		
	Metals	
		Aluminum
		Antimony
		Arsenic
		Barium
		Beryllium
		Cadmium
		Chromium, Total
		Cobalt
		Copper
		Iron
		Lead
		Lithium
		Manganese
		Mercury
		Molybdenum
		Nickel
		Selenium
		Silver
		Thallium
		Vanadium
		Zinc

TABLE 15
ION CHROMATOGRAPHY

Analytical Technique	Class	Analyte
Ion Chromatography		
	Metals	
		Chromium, Hexavalent
	Nutrients	
		Nitrate + nitrite
		Nitrate
		Nitrite
		Orthophosphate
	Wet Chemistry	
		Bromide
		Chloride
		Fluoride
		Sulfate

TABLE 16
LIQUID CHROMATOGRAPHY-MASS SPECTROMETRY

Analytical Technique	Class	Analyte
Liquid Chromatography/Mass Spectrometry		
	Base, Neutral, and Acid Extractable Semivolatiles, Benzidines	
		Benzidine
		3,3'-Dichlorobenzidine
		3,3'-Dimethoxybenzidine
		3,3'-Dimethylbenzidine
	Pesticides, Acid Herbicides	
		2,4,5-T
		2,4,5-T, butoxyethanol Ester
		2,4,5-T, Butyl Ester
		2,4,5-TP (Silvex)
		2,4-D
		2,4-D, Butoxyethanol Ester
		2,4-D, Ethylhexyl Ester
		2,4-DB
		Dichlorprop
		Dinoseb
		MCPA Salts and Esters
		MCPP Salts and Esters
	Pesticides, Nitrogen	
		Benzoylprop Ethyl
		Bromacil
		Dalapon
		Dicamba
		Propachlor
	Pesticides, N-Methyl Carbamates and Substituted Ureas	
		3-Hyroxycarbofuran
		Aldicarb
		Aldicarb Sulfone
		Aldicarb Sulfoxide
		Aminocarb
		Asulam
		Barban
		Bendiocarb
		Benomyl
		Carbaryl
		Carbendazim
		Carbofuran
		Chloropropham
		Chloroxuron
		Diuron
		Fenuron
		Fluometuron
		Linuron

Analytical Technique	Class	Analyte
Liquid Chromatography/Mass Spectrometry		
		Methiocarb
		Methomyl
		Mexacarbate
		Monuron
		Neburon
		o-Chlorophenyl Thiourea
		Oxamyl
		Propham
		Propoxur
		Siduron
		Tebuthiuron
		Thiofanox
	Pesticides, Not Otherwise Specified	
		Rotenone
	Pesticides, Organophosphorus	
		Dichlorvos
		Dimethoate
		Disulfoton
		Famphur
		Fensulfoton
		Merphos
		Monocrotophos
		Naled
		Parathion Methyl
		Phorate
		Trichlorphon

TABLE 17
POLAROGRAPHY

Analytical Technique	Class	Analyte
Polarography		
	Metals	
		Chromium, Hexavalent

TABLE 18
TITRIMETRIC OR POTENTIOMETRIC TITRATION ASSAYS

Analytical Technique	Class	Analyte
Titrimetric or Potentiometric Titrimetric Assays		
	Demand	
		Biochemical Oxygen Demand
		Carbonaceous BOD
		Chemical Oxygen Demand
	Metals	

Analytical Technique	Class	Analyte
Titrimetric or Potentiometric Titrimetric Assays		
		Calcium
	Nutrients	
		Ammonia as N
		Kjeldahl Nitrogen, Total
	Wet Chemistry	
		Acidity as $CaCO_3$
		Alkalinity
		Bromide
		Chloride
		Chlorine, Total Residual
		Cyanide, Amenable
		Cyanide, Total
		Hardness, Total as $CaCO_3$
		Sulfide
		Sulfides, Acid-Soluble and Acid-Insoluble
		Sulfite

TABLE 19
ULTRA-LOW LEVEL METALS ANALYSIS

Analytical Technique	Class	Analyte
Ultra-Low Level Metals Assays		
	Metals	
		Mercury

TABLE 20
VOLTAMMETRY

Analytical Technique	Class	Analyte
Voltammetry		
	Metals	
		Arsenic
		Mercury

TABLE 21
WASTE CHARACTERISTIC EXTRACTIONS [1]

Analytical Technique	Class	Analyte
Extractables		
	Waste Characterization Extractions	
		Extraction Procedure Toxicity Test Method
		Multiple Extraction Procedure
		Synthetic Precipitation Leaching Procedure
		Toxicity Characteristic Leaching Procedure

[1] Certification or registration for Waste Characteristic Extractions available only in the solid matrix.

TABLE 22
WASTE CHARACTERIZATION ASSAYS [1]

Analytical Technique	Class	Analyte
Waste Characteristics		
	Waste Characterization Assays	
		Paint Filters Liquids Test
		PCB Screening in Waste Solvent
		Corrosivity Toward Steel
		Corrosivity, Liquids
		Ignitability of Solids
		Ignitability, Oxidizers
		Ignitability, Pensky-Martens Closed Cup
		Ignitability, Setaflash Closed Cup
		Ignitability, Small Scale Closed Cup
		Ignitability, Solids
		Waste Analysis, Other
		Water in Waste by Calcium Hydride
		Water in Waste by KF
		Liquid Release Test Procedure

[1] Certification or registration for Waste Characterization Assays available only in the solid matrix.

TABLE 23
WHOLE EFFLUENT TOXICITY ASSAYS [1]

Analytical Technique	Class	Analyte
Whole Effluent Toxicity Assays		
	Acute Whole Effluent Toxicity	
		Ceriodaphnia dubia
		Pimephales promelas
	Chronic Whole Effluent Toxicity	
		Ceriodaphnia dubia
		Pimephales promelas
		Selanastrum capricornutum

[1] Certification or registration for Whole Effluent Toxicity Assays available only in the aqueous matrix.

APPENDIX II
METHODS, ANALYTES AND ANALYTE GROUPS FOR CERTIFICATION IN THE DRINKING WATER MATRIX

TABLE A
DISINFECTION BYPRODUCTS

Class	Analytical Method	Analyte
Disinfection Byproducts		
	300.0[1]	Bromide Chlorite
	300.1[2]	Bromate Bromide Chlorate Chlorite
	552.1[3]	Haloacetic Acids (five)
	552.2[4]	Haloacetic Acids (five)
	4500-Cl D[5,6]	Chlorine, Total Chlorine, Combined
	4500-Cl E[5,6]	Chlorine, Total
	4500-Cl F[5,6]	Chlorine, Total Chlorine, Combined
	4500-Cl G[5,6]	Chlorine, Total Chlorine, Combined
	4500-Cl I [5,6]	Chlorine, Total
	4500-Cl-E[5,6]	Chlorine, Total
	4500-Cl-F[3,4]	Chlorine, Total
	4500-Cl-H[5,6]	Chlorine, Free Chlorine, Total
	4500-Cl-I[5,6]	Chlorine, Total
	4500-ClO2-E[5,6]	Chlorite
	6251B[6]	Haloacetic Acids (five)
	D1253-86[7]	Chlorine, Combined

[1] "Methods for the Determination of Inorganic Substances in Environmental Samples", EPA/600/R-930100, August 1993, Available at NTIS, PB 94-121811.
[2] "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water- Volume I", EPA-815-R-00-014, August 2000. Available from NTIS, PB2000-106981, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161.
[3] "Methods for the Determination of Organic Compounds in Drinking Water- Supplement II", EPA-600/R-92/129, DATE, Available at NTIS, PB92-207703.
[4] "Methods for the Determination of Organic Compounds in Drinking Water- Supplement III", EPA-600/R-95/131, DATE, Available at NTIS PB95-261616.
[5] "Standard Methods for the Examination of Water and Wastewater", American Public Health Association, American Water Works Association, Water Pollution Control Federation, 18th edition, 1989, 1015 Fifteenth Street N.W., Washington DC 20005.
[6] "Standard Methods for the Examination of Water and Wastewater", American Public Health Association, American Water Works Association, Water Pollution Control Federation, 19th edition, 1995, 1015 Fifteenth Street N.W., Washington DC 20005.
[7] "Annual Book of ASTM Standards, Vols. 11.01 and 11.02, 1994. Available from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103. The same method on the current edition may be used if the date of method revisions is the same as the 1991 edition.

TABLE B
PRIMARY INORGANICS

Class	Analytical Method	Analyte
Primary Inorganic Contaminants		
	180.1[1]	Turbidity
	200.7[2]	Arsenic
		Barium
		Beryllium
		Cadmium
		Chromium
		Copper
		Nickel
	200.8[2]	Antimony
		Arsenic
		Barium
		Beryllium
		Cadmium
		Chromium
		Copper
		Lead
		Mercury
		Nickel
		Selenium
		Thallium
	200.9[2]	Antimony
		Arsenic
		Beryllium
		Cadmium
		Chromium
		Copper
		Lead
		Nickel
		Selenium
		Thallium
	245.1[2]	Mercury
	245.2[3]	Mercury
	300.0[1]	Fluoride
		Nitrate
		Nitrite
	335.4[1]	Cyanide
	353.2[1]	Nitrate
		Nitrite
	2130B[4,5]	Turbidity

Class	Analytical Method	Analyte
Primary Inorganic Contaminants		
	3111B[4,5]	Copper
		Nickel
	3111D[4,5]	Barium
	3112B[4,5]	Mercury
	3113B[4,5]	Antimony Arsenic Barium Beryllium Cadmium Chromium Copper Lead Nickel Selenium
	3114B[4,5]	Arsenic Selenium
	3120B[4,5,6]	Arsenic Barium Beryllium Chromium Copper Nickel
	4110B[4,5, 6]	Fluoride Nitrate Nitrite
	4500-CN-C,E[4,5, 6]	Cyanide
	4500-CN-C,F[4,5, 6]	Cyanide
	4500-CN-C,G[4,5, 6]	Cyanide, Amenable
	4500F-B, D[4,5, 6]	Fluoride
	4500F-C[4,5, 6]	Fluoride
	4500F-E[4,5, 6]	Fluoride
	4500-NO2-B[4,5, 6]	Nitrite
	4500-NO3-D[4,5, 6]	Nitrate
	4500-NO3-E[4,5, 6]	Nitrate Nitrite
	4500-NO3-F[4,5, 6]	Nitrate Nitrite
	10-2-4-00-1-X[7]	Cyanide
	1296-71W[8]	Fluoride
	380-75WE[8]	Fluoride
	601[9]	Nitrate
	B-1011[10]	Nitrate

Class	Analytical Method	Analyte
Primary Inorganic Contaminants		
		Nitrite
	D1179-93B[11]	Fluoride
	D1688-95A[11]	Copper
	D1688-95C[11]	Copper
	D2036-91A[11]	Cyanide
	D2036-91B[11]	Cyanide
	D2972-93B[11]	Arsenic
	D2972-93C[11]	Arsenic
	D3233-91[11]	Mercury
	D3559-95D[11]	Lead
	D3645-93B[11]	Beryllium
	D3697-92[11]	Antimony
	D3859-93A[11]	Selenium
	D3859-93B[11]	Selenium
	D3867-90A[11]	Nitrate
	D3867-90A[11]	Nitrite
	D3867-90B[11]	Nitrate
	D3867-90B[11]	Nitrite
	D4327-91[11]	Fluoride Nitrate Nitrite
	I-3300-85[12]	Cyanide
	Kelada 01[13]	Cyanide
	Method 215[14]	Turbidity
	Palintest 1001[15]	Lead

[1] "Methods for the Determination of Inorganic Substances in Environmental Samples", EPA-600/R-93-100, August 1993. Available at NTIS PB94-121811.
[2] "Methods for the Determination of Metals in Environmental Samples- Supplement I", ORD Publications, EPA/600/R-94-111 May 1994. Available from National Technical Information Service, Order #PB94-18492, 5285 Port Royal Road, Springfield, VA 21161.
[3] Method 245.2 is available from US EPA, EMSL, Cincinnati, OH 45268. The identical methods were formerly in "Methods for Chemical Analysis of Water and Wastes" EPA-600/4-79-020), March 1983. Available at National Technical Information Service, PB84-128677, 5285 Port Royal Road, Springfield, VA 22161.
[4] "Standard Methods for the Examination of Water and Wastewater", 18th edition, American Public Health Association, American Water Works Association, 1992. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, N.W., Washington DC 20005.
[5] "Standard Methods for the Examination of Water and Wastewater", 19th edition, American Public Health Association, American Water Works Association, 1992. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, N.W., Washington DC 20005.
[6] "Standard Methods for the Examination of Water and Wastewater", 20th edition, American Public Health Association, American Water Works Association, 1998. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, N.W., Washington DC 20005.
[7] "Digestion and distillation of total cyanide in drinking and wastewaters using MICRO DIST and determination of cyanide by flow injection analysis", Revision 2.1, November 30, 2000, Lachat Instruments, 6645 W. Mill Road, Milwaukee, WI 53218.
[8] The procedures shall be done in accordance with the Industrial Method No 129-71 W, "Fluoride in Water and Wastewater", December 1972 and Method Number 380-75WE, "Fluoride in Water and Wastewater", February 1976, Technicon Industrial Systems. Copies may be obtained from the Technicon Industrial Systems, Tarrytown, NY 10591.
[9] Technical Bulletin 601 "Standard Method of Test for Nitrate in Drinking Water", July 1994, PN 221890-001, Thermo Orion, 500 Cummins Center, Beverly, MA 01915+9846. This method is identical to Orion WeWWG/5580, which is approved for nitrate analysis. ATI Orion republished the method in 1994, and renumbered it as 601, because the 1985 manual, "Orion Guide to Water and Wastewater Analysis," which contained WeWWG/5880, is no longer available.

[10] Waters Test Method for the Determination of Nitrate/Nitrite in Water using Single Column Ion Chromatography", Method B-1011, Millipore Corporation, Waters Chromatography Division, 34 Maple Street, Milford, MA 01757.
[11] The procedures shall be done in accordance with the "Annual Book of ASTM Standards", 1994, Vols 11.01 and 11.02. Copies may be obtained from the American Society for Testing Material, 1916 Race Street, Philadelphia, PA 19103.
[12] "Methods for the Analysis of Inorganic Substances in Water and Fluvial Sediments", U.S. Department of the Interior, U.S. Geological Survey, Federal Center, P.O. Box 25425, Denver, CO 80225-0425.
[13] Kelada Automated Test Methods for Total Cyanide, PB 2001-108275. Available from National Technical Information Service, Order #PB2001-108275, 5285 Port Royal Road, Springfield, VA 22161.
[14] GLI Method 2, "Turbidity", November 2, 1992. Great Lakes Instruments, Inc. 8855 North 55th Street, Milwaukee, WI 53223.
[15] "Method 1001: Lead in Drinking Water by Differential Pulse Anodic Stripping Voltammetry", August 1999, Palintest Ltd, 21 Kenton Lands Road, Erlanger, KY 41018.

TABLE C
SECONDARY CONTAMINANTS

Class	Analytical Method	Analyte
Secondary Contaminants		
	150.1[1]	pH
	150.2[2]	pH
	200.7[2]	Aluminum Calcium Iron Manganese Silica Silver Sodium Zinc
	200.8[2]	Aluminum Manganese Silver Zinc
	200.9[2]	Aluminum Iron Manganese Silver
	300.0[1]	Chloride Orthophosphate Sulfate
	365.1[1]	Orthophosphate
	375.2[1]	Sulfate
	2120B[3,4]	Color
	2150B[3,4]	Odor
	2320B[3,4]	Alkalinity
	2510B[3,4]	Conductivity
	2540C[3,4]	Total Dissolved Solids (TDS)
	2550B[3,4]	Temperature
	3111B[3,4]	Calcium Iron

Class	Analytical Method	Analyte
Secondary Contaminants		
		Manganese Silver Sodium Zinc
	3111D[3,4]	Aluminum
	3113B[3,4]	Aluminum Iron Manganese Silver
	3120B[3,4]	Aluminum Calcium Iron Manganese Silica Silver Zinc
	3500-Ca D[3,4]	Calcium
	4110B[3,4]	Chloride
	4110B[5]	Orthophosphate Sulfate
	4500-Cl-B[3,4]	Chloride
	4500-Cl-D[3,4]	Chloride
	4500-ClO2-D[3,4]	Chlorine Dioxide
	4500-ClO2-E[3,4]	Chlorine Dioxide
	4500-H+-B[3,4]	pH
	4500-O3-B[3,4]	Ozone
	4500-P-E[3,4]	Orthophosphate
	4500-P-F[3,4]	Orthophosphate
	4500-Si-D[3,4]	Silica
	4500-Si-E[3,4]	Silica
	4500-Si-F[3,4]	Silica
	4500-SO4-C, D[3,4,5]	Sulfate
	4500-SO4-F[3,4,5]	Sulfate
	5540C[3,4]	Foaming Agents
	D1067-92B[6]	Alkalinity
	D1125-95A[6]	Conductivity
	D1293-95A[6]	pH
	D4327-91[6]	Chloride
	D4327-91[6]	Orthophosphate
	D4327-91[6]	Sulfate
	D511-93A[6]	Calcium

Class	Analytical Method	Analyte
Secondary Contaminants		
	D511-93B[6]	Calcium
	D512-89B[6]	Chloride
	D515-88A[6]	Orthophosphate
	D859-95[6]	Silica
	I-1030-85[7]	Alkalinity
	I-1601-85[7]	Orthophosphate
	I-1700-85[7]	Silica
	I-2598-85[7]	Orthophosphate
	I-2601-90[7]	Orthophosphate
	I-2700-85[7]	Silica
	I-3720-85[7]	Silver

[1] "Methods for the Determination of Inorganic Substances in Environmental Samples", EPA-600/R-93-100, August 1993. Available from National Technical Information Service, Order # PB94-121811 5285 Port Royal Road, Springfield, VA 21161.
[2] "Methods for the Determination of Metals in Environmental Samples- Supplement I", ORD Publications, EPA/600/R-94-111 May 1994. Available from National Technical Information Service, Order #PB94-18492, 5285 Port Royal Road, Springfield, VA 21161.
[3] "Standard Methods for the Examination of Water and Wastewater", 18th edition, American Public Health Association, American Water Works Association, 1015 Fifteenth Street, N.W., Washington DC 1992.
[4] "Standard Methods for the Examination of Water and Wastewater", 19th edition, American Public Health Association, American Water Works Association, 1015 Fifteenth Street, N.W., Washington DC 1992.
[5] "Standard Methods for the Examination of Water and Wastewater", 20th edition, American Public Health Association, American Water Works Association, 1015 Fifteenth Street, N.W., Washington DC 1998.
[6] "Annual Book of Standards, Section 11.01 and 11.02, Water and Environmental Technology", American Society for Testing Material, 1916 Race Street, Philadelphia, PA 194, 1996 and 1999.
[7] "Methods for Analysis of Inorganic Substances in Water and Fluvial Sediments", U.S. Department of the Interior, U.S. Geological Survey, Denver, CO, 1989.

TABLE D
SYNTHETIC ORGANIC CONTAMINANTS

Class	Analytical Method	Analyte
Synthetic Organic Contaminants		
	504.1[4]	Dibromochloropropane (DBCP)
		Ethylene Dibromide (EDB)
	505[4]	Alachlor
		Aldrin
		Atrazine
		Chlordane
		Dieldrin
		Endrin
		Heptachlor
		Heptachlor Epoxide
		Hexachlorobenzene
		Hexachlorocyclopentadiene
		Lindane
		Methoxychlor
		Polychlorinated Biphenyls (as Aroclors)

Class	Analytical Method	Analyte
Synthetic Organic Contaminants		
		Simazine
		Toxaphene
	506 [4]	Di(2-ethylhexyl)adipate
		Di(2-ethylhexyl)phthalate
	507[4]	Alachlor
		Atrazine
		Butachlor
		Metolachlor
		Metribuzin
		Propachlor
		Simazine
	508[4]	Aldrin
		Chlordane
		Dieldrin
		Endrin
		Heptachlor
		Heptachlor Epoxide
		Hexachlorobenzene
		Hexachlorocyclopentadiene
		Lindane
		Methoxychlor
		Polychlorinated Biphenyls (as Aroclors)
		Toxaphene
	508.1[4]	Alachlor
		Aldrin
		Atrazine
		Chlordane
		Dieldrin
		Endrin
		Heptachlor
		Heptachlor Epoxide
		Hexachlorobenzene
		Hexachlorocyclopentadiene
	508.1[4]	Lindane
		Methoxychlor
		Metolachlor
		Metribuzin
		Propachlor
		Simazine
		Toxaphene
	508A[1]	Polychlorinated Biphenyls (as Decachlorobiphenyl)
	515.1[1]	2,4,5-TP (Silvex)

Class	Analytical Method	Analyte
Synthetic Organic Contaminants		
		2,4-D
		Dalapon
		Dicamba
		Dinoseb
		Pentachlorophenol
		Picloram
	515.2[3]	2,4,5-TP (Silvex)
		2,4-D
		Dicamba
		Dinoseb
		Pentachlorophenol
		Picloram
	515.3[5]	2,4,5-TP (Silvex)
		2,4-D
		Dalapon
		Dicamba
		Dinoseb
		Pentachlorophenol
		Picloram
	515.4[6]	2,4,5-TP (Silvex)
		2,4-D
		Dalapon
		Dicamba
		Dinoseb
		Pentachlorophenol
		Picloram
	525.2[3]	Alachlor
		Aldrin
		Atrazine
		Benzo(a)pyrene
		Butachlor
		Chlordane
		Di(2-ethylhexyl)adipate
		Di(2-ethylhexyl)phthalate
		Dieldrin
		Endrin
		Heptachlor
		Heptachlor Epoxide
		Hexachlorobenzene
		Hexachlorocyclopentadiene
		Lindane
		Methoxychlor

Class	Analytical Method	Analyte
Synthetic Organic Contaminants		
		Metolachlor
		Metribuzin
		PCB (as decachlorobiphenyl)
		Pentachlorophenol
		Propachlor
		Simazine
		Toxaphene
	531.1[3]	3-Hydroxycarbofuran
		Aldicarb
		Aldicarb Sulfone
		Aldicarb Sulfoxide
		Carbaryl
		Carbofuran
		Methomyl
		Oxamyl (Vydate)
	531.2[4]	3-Hydroxycarbofuran
		Aldicarb
		Aldicarb Sulfone
		Aldicarb Sulfoxide
		Carbaryl
		Carbofuran
		Methomyl
		Oxamyl (Vydate)
	547[2]	Glyphosate
	548.1[2]	Endothall
	549.2[5]	Diquat
	550[2]	Benzo(a)pyrene
	550.1[2]	Benzo(a)pyrene
	551[1]	Dibromochloropropane (DBCP)
		Ethylene Dibromide (EDB)
	551.1[2]	Alachlor
		Atrazine
		Endrin
		Heptachlor
		Heptachlor Epoxide
		Hexachlorobenzene
		Hexachlorocyclopentadiene
		Lindane
		Methoxychlor
		Simazine
	552.1[2]	Dalapon

Class	Analytical Method	Analyte
Synthetic Organic Contaminants		
	552.2[4]	Dalapon
	555[3]	2,4,5-TP (Silvex)
		2,4-D
		Dicamba
		Dinoseb
		Pentachlorophenol
		Picloram
	1613[7]	2,3,7,8-TCDD (Dioxin)
	6610B[8,9,10]	3-Hydroxycarbofuran
		Aldicarb
		Aldicarb Sulfone
		Aldicarb Sulfoxide
		Carbaryl
		Carbofuran
		Methomyl
		Oxamyl (Vydate)
	6651B[8,9,10]	Glyphosate
	AG625[11]	Atrazine
	D5317-93[12]	2,4,5-TP (Silvex)
	D5317-93[12]	2,4-D
	D5317-93[12]	Pentachlorophenol
	D5317-93[12]	Picloram

[1] "Methods for the Determination of Organic Compounds in Drinking Water" EPA-600/4-88-039, December 1988, Revised July 1991. Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 21161.
[2] "Methods for the Determination of Organic Compounds in Drinking Water- Supplement I", EPA-600-4-90-020, July 1990. Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 21161.
[3] "Methods for the Determination of Organic Compounds in Drinking Water- Supplement II", EPA-600/R-92-129. Available from National Technical Information Service, Order Port Royal Road, Springfield, VA 21161.
[4] "Methods for the Determination of Organic Compounds in Drinking Water- Supplement III", EPA 600/R-95/131. Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 21161.
[5] "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water- Volume 1", EPA 815-R-00-014, August 2000. Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 21161.
[6] "Method 515.4 Determination of Chlorinated Acids in Drinking Water by Liquid-Liquid Microextraction, Derivatization, and Fast Gas Chromatography with Electron Capture Detection", Rev. 1.0, April 2000. Available from Technical Support Center, Office of Groundwater and Drinking Water, US EPA, Cincinnati, OH 45268.
[7] "Tetra-Through Octa-Chlorinated Dioxins and Furans by Isotopic Dilution HRGC/HRMS", EPA-81/B-94-003, October 1994. Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 21161.
[8] "Standard Methods for the Examination of Water and Wastewater", 18th edition, American Public Health Association, American Water Works Association, 1992. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, N.W., Washington DC 20005.
[9] "Standard Methods for the Examination of Water and Wastewater", 19th edition, American Public Health Association, American Water Works Association, 1992. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, N.W., Washington DC 20005.
[10] "Standard Methods for the Examination of Water and Wastewater", 20th edition, American Public Health Association, American Water Works Association, 1998. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, N.W., Washington DC 20005.
[11] "Method AG625" Syngenta Corp.
[12] The procedures shall be done in accordance with the "Annual Book of ASTM Standards", 1994, Vols 11.01 and 11.02. Copies may be obtained from the American Society for Testing Material, 1916 Race Street, Philadelphia, PA 19103.

TABLE E
TRIHALOMETHANES

Class	Analytical Method	Analyte
Trihalomethanes	502.2[1]	***Trihalomethanes Analyte Group***
		Bromodichloromethane
		Bromoform
		Chloroform
		Dibromochloromethane
	524.2[2]	***Trihalomethanes Analyte Group***
		Bromochloromethane
		Bromoform
		Chloroform
		Dibromochloromethane
	551.1[1]	***Trihalomethanes Analyte Group***
		Bromodichloromethane
		Bromoform
		Chloroform
		Dibromochloromethane

[1] "Methods for the Determination of Organic Compounds in Drinking Water- Supplement III", EPA 600/R-95/131. Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 21161.
[2] "Methods for the Determination of Organic Compounds in Drinking Water- Supplement II", EPA-600/R-92-129. Available from National Technical Information Service, Port Royal Road, Springfield, VA 21161.

TABLE F
VOLATILE ORGANIC COMPOUNDS

Class	Analytical Method	Analyte
Volatile Organic Compounds		
	502.2[1]	***Volatile Organic Compounds Analyte Group by EPA Method 502.2***
		Regulated VOCs
		1,1,1-Trichloroethane
		1,1,2-Trichloroethane
		1,1-Dichloroethylene
		1,2,4-Trichlorobenzene
		1,2-Dichlorobenzene
		1,2-Dichloroethane
		1,2-Dichloropropane
		1,4-Dichlorobenzene
		Benzene
		Carbon Tetrachloride
		Chlorobenzene
		cis-1,2-Dichloroethylene
		Dichloromethane

Class	Analytical Method	Analyte
		Ethylbenzene
		Styrene
		Tetrachloroethylene
		Toluene
		trans-1,2-Dichloroethylene
		Trichloroethylene
		Vinyl Chloride
		Xylenes (Total)
		Unregulated VOCs
		1,1-Dichloroethane
		1,1-Dichloropropene
		1,2,3-Trichlorobenzene
		1,2,3-Trichloropropane
		1,2,4-Trimethylbenzene
		1,3,5-Trimethylbenzene
		1,3-Dichloropropane
		1,3-Dichloropropene (cis, trans)
		2,2-Dichloropropane
		Bromobenzene
		Bromochloromethane
		Chloroethane
		Chloromethane
		Dibromomethane
		Dichlorodifluoromethane
		Fluorotrichloromethane
		Hexachlorobutadiene
		Isopropylbenzene
		m-Dichlorobenzene
		Naphthalene
		n-Butylbenzene
		n-Propylbenzene
		o-Chlorotoluene
		p-Chlorotoluene
		p-Isopropylbenzene
		sec-Butylbenzene
		tert-Butylbenzene
	542.2[2]	***Volatile Organic Compounds Analyte Group by EPA Method 524.2***
		Regulated VOCs
		1,1,1-Trichloroethane
		1,1,2-Trichloroethane
		1,1-Dichloroethylene
		1,2,4-Trichlorobenzene
		1,2-Dichlorobenzene

Class	Analytical Method	Analyte
		1,2-Dichlorobenzene
		1,2-Dichloroethane
		1,2-Dichloropropane
		1,4-Dichlorobenzene
		Benzene
		Carbon Tetrachloride
		Chlorobenzene
		cis-1,2-Dichloroethylene
		Dichloromethane
		Ethylbenzene
		Styrene
		Tetrachloroethylene
		Toluene
		trans-1,2-Dichloroethylene
		Trichloroethylene
		Vinyl Chloride
		Xylenes (Total)
		Unregulated VOCs
		1,1,2,2,-Tetrachloroethane
		1,1,2,2-Tetrachloroethane
		1,1-Dichloroethane
		1,1-Dichloropropene
		1,2,3-Trichlorobenzene
		1,2,3-Trichloropropane
		1,2,4-Trimethylbenzene
		1,3,5-Trimethylbenzene
		1,3-Dichloropropane
		1,3-Dichloropropene (cis, trans)
		2,2-Dichloropropane
		Bromobenzene
		Chloroethane
		Chloromethane
		Dibromomethane
		Dichlorodifluoromethane
		Fluorotrichloromethane
		Hexachlorobutadiene
		Isopropylbenzene
		m-Dichlorobenzene
		Naphthalene
		n-Butylbenzene
		n-Propylbenzene
		o-Chlorotoluene
		p-Chlorotoluene

Class	Analytical Method	Analyte
		p-Isopropylbenzene
		sec-Butylbenzene
		tert-Butylbenzene
	551[1]	Carbon Tetrachloride
		1,1,1-Trichloroethane
		1,1,2-Trichloroethane
		Tetrachloroethylene
		Trichloroethylene

[1] "Methods for the Determination of Organic Compounds in Drinking Water- Supplement III", EPA 600/R-95/131. Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 21161.
[2] "Methods for the Determination of Organic Compounds in Drinking Water- Supplement II", EPA-600/R-92-129. Available from National Technical Information Service, Port Royal Road, Springfield, VA 21161.

APPENDIX III
LIST OF AUTHORITATIVE SOURCES

Note: Methods approved by the department for analyzing samples for compliance with covered programs are contained in chs. NR 157, 219, 605, 635, 700, 716 and 809. Procedures and practices required of laboratories are contained in subchs. I to VII. This list of authoritative sources is provided for information only. Inclusion of a method, procedure or practice in any of these authoritative sources does not grant it approval by the department. The department may recognize or approve other methods of analysis not contained in these authoritative sources as allowed in ss. NR 149.41 and 149.42.

1. "Analytical Methods for the Determination of Pollutants in Pharmaceutical Manufacturing Industry Wastewater", EPA/821/B-94-001, EPA, Washington, DC, 1995.
2. "Analytical Methods for the Determination of Pollutants in Pulp and Paper Industry Wastewater" EPA 821-R-93-017, EPA, Washington, DC, 1993.
3. "Annual Book of Standards, Sections 11.01 and 11.02, Water and Environmental Technology", American Society for Testing and Materials, Philadelphia, PA, 1994, 1996, and 1999.
4. "Code of Federal Regulations, Title 40, Part 136, Appendices A and B", U.S. Government Printing Office, Washington, DC.
5. "Manual for the Certification of Laboratories Analyzing Drinking Water, Criteria and Procedures, Quality Assurance", Fifth Edition, EPA 815-R-05-004, EPA, Cincinnati, OH, 2005.
6. "Method 1613 Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS", EPA-81/B-94-003, EPA, Washington, DC, 1994.
7. "Method 1631, Revision E: Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry", EPA-821-R-02-019, EPA, Washington, DC, 2002.
8. "Method 1664, Revision A; N-Hexane Extractable Material (HEM; Oil and Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM) by Extraction and Gravimetry", EPA-821-R-98-002, EPA, Washington DC, 1999.
9. "Method 1668, Revision A: Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by HRGC/HRMS", EPA-821-R-00-002, EPA, Washington, DC, 1999."
10. "Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels", EPA/821/R-96-011, EPA, Washington, DC, 1996.
11. "Methods for Analysis of Inorganic Substances in Water and Fluvial Sediments", U.S. Department of the Interior, U.S. Geological Survey, Denver, CO, 1989.
12. "Methods for Chemical Analysis of Water and Wastes", EPA-600/-4-79/020, Environmental Monitoring and Support Laboratory, Cincinnati, OH, March 1983.
13. "Methods for the Determination of Inorganic Substances in Environmental Samples" EPA/600/R-93/100, EPA, Washington DC, 1993.
14. "Methods for the Determination of Metals in Environmental Samples", EPA/600/4-91/010, EPA/600/R-94/111, EPA, Washington, DC, 1991, 1994.
15. "Methods for the Determination of Organic Compounds in Drinking Water", EPA/600/4-88/039, EPA/600/4-90/020, EPA/600/R-95/131, Environmental Monitoring Systems Laboratory, Cincinnati, OH, 1990, 1991, 1992, 1995.
16. "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water-Volume 1" EPA 815-R-00-014, EPA, Cincinnati, OH, 2000.
17. "Methods for the Determination of Nonconventional Pesticides in Municipal and Industrial Wastewater (Volume 1)", EPA-821-R-93-010-A, Environmental Monitoring Systems Laboratory, Cincinnati, OH, 1993.
18. "Official Methods of Analysis of the Association of Official Analytical Chemists", 15th edition, Arlington, VA, 1990.
19. "Modified GRO – Method for Determining Gasoline Range Organics" WI-PUBL-SW-140, Wisconsin Department of Natural Resources, Madison, WI, 1995.
20. "Modified DRO – Method for Determining Diesel Range Organics" WI-PUBL-SW-141, Wisconsin Department of Natural Resources, Madison, WI, 1995.
21. "NELAC Standard 2003", EPA/600/R-04/003, National Environmental Laboratory Accreditation Conference, Washington, DC, 2003.
22. "Principles of Environmental Analysis", Analytical Chemistry, volume 55, pages 2210-2218, Washington DC, 1983.
23. "Standard Methods fort the Examination of Water and Wastewater", 18th, 19th, and 20th editions, American Public Health Association, Washington DC, 1992, 1995 and 1998.

24. "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" SW-846, Third Edition, Updates I, II, IIB, III, IVA, IVB, IIIB, EPA, Office of Solid Waste and Emergency Response, Washington DC 1986, 1992, 1994, 1995, 1996, 1998, 2000, 2002.

SECTION 2 EFFECTIVE DATE. This rule shall take effect on the first day of the month following publication in the Wisconsin administrative register as provided in s. 227.22(2)(intro.), Stats.

SECTION 3. BOARD ADOPTION. This rule was approved and adopted by the State of Wisconsin Natural Resources Board on _____.

Dated at Madison, Wisconsin _____.

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

By _____
Scott Hassett, Secretary

(SEAL)