

**Code of Ethics
Of
NPHE Laboratory
2016**

Ethics Statement:

It is clearly and without exception the policy of the NPHE Laboratory that all work performed by the laboratory – including all employees in whatever capacity- must be performed with the highest ethical standards. Falsification or inappropriate manipulation of data is not to be tolerated.

The laboratory recognizes that workload may be sporadic and at times extremely heavy. Efforts of employees to meet these heavy workloads are appreciated on behalf of agencies, individuals and companies utilizing our services; under no circumstances, however, should unethical “shortcuts” be taken. Every effort should be made to provide services of the highest quality, but if quality control criteria cannot be met, no deception or concealment may be made.

Employees are reminded, for their own protection and the protection of the laboratory, that failure to report known unethical behavior may result in the employee being implicated in that behavior. Avenues are available to report violations through the Lab Laboratory Manager, the Quality Assurance Manager, or the Administrator of the NDHHS Public Health Environmental Unit.

Unethical behavior harms the people depending on our work, the employees involved as well as their colleagues, the reputation of the laboratory, and the State of Nebraska and will not be tolerated.

Employees of the NPHE Laboratory are charged with:

- Providing accountability for the quality and integrity of the laboratory services they provide. This responsibility requires that employees properly document pertinent laboratory functions and that data produced by them are of known, documented quality.
- Striving to maintain and improve their technical knowledge and professional competence. This responsibility requires that employees become familiar with the tools and information necessary for the performance of their assigned duties.
- Maintaining cooperative, professional, positive working relationships with colleagues and laboratory customers.

I declare that I have received a copy of the Quality Assurance Plan including the 2014 Ethics Statement. Furthermore, I understand that any violation of the above Ethics Statement is just cause for disciplinary action up to and including dismissal from my position within the NPHE Laboratory and liability to civil and criminal penalties.

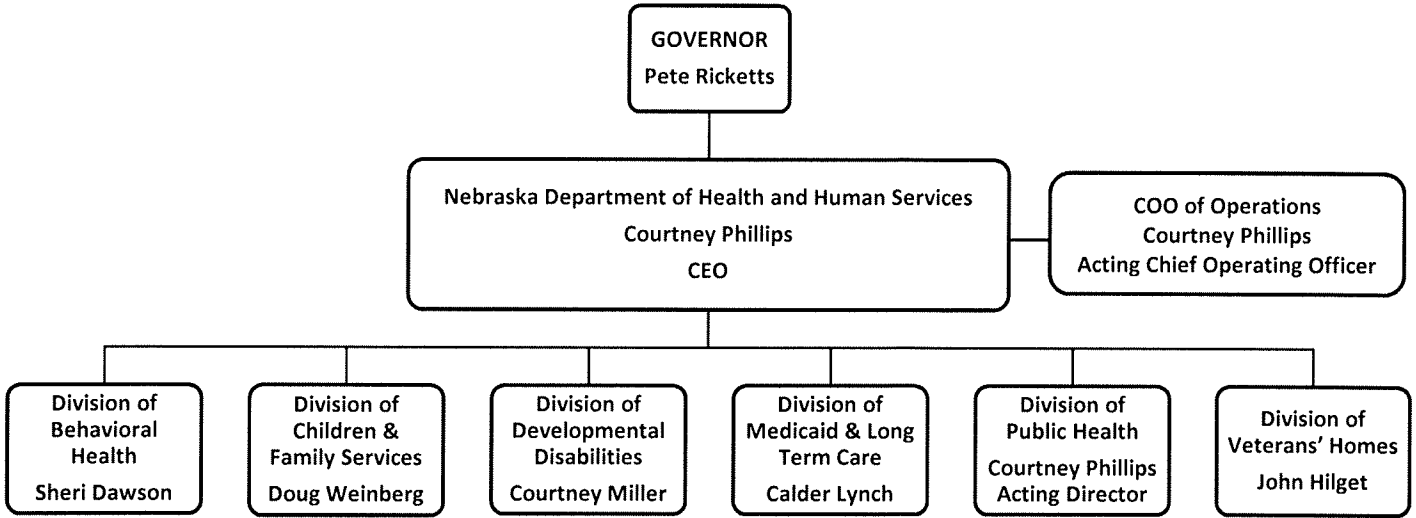
My signature below attests to the fact that I have read, understand and agree to adhere to the above stated NPHE Laboratory’s Code of Ethics. I understand that this document will be placed in my personnel file located in NDHHS Human Resources located in the State Office Building. A copy will be placed in my personal QA training file located in the NPHE Lab QA Office located at 3701 South 14th Street, Lincoln Nebraska. I have received a copy of this document for my own records.

Name

Date

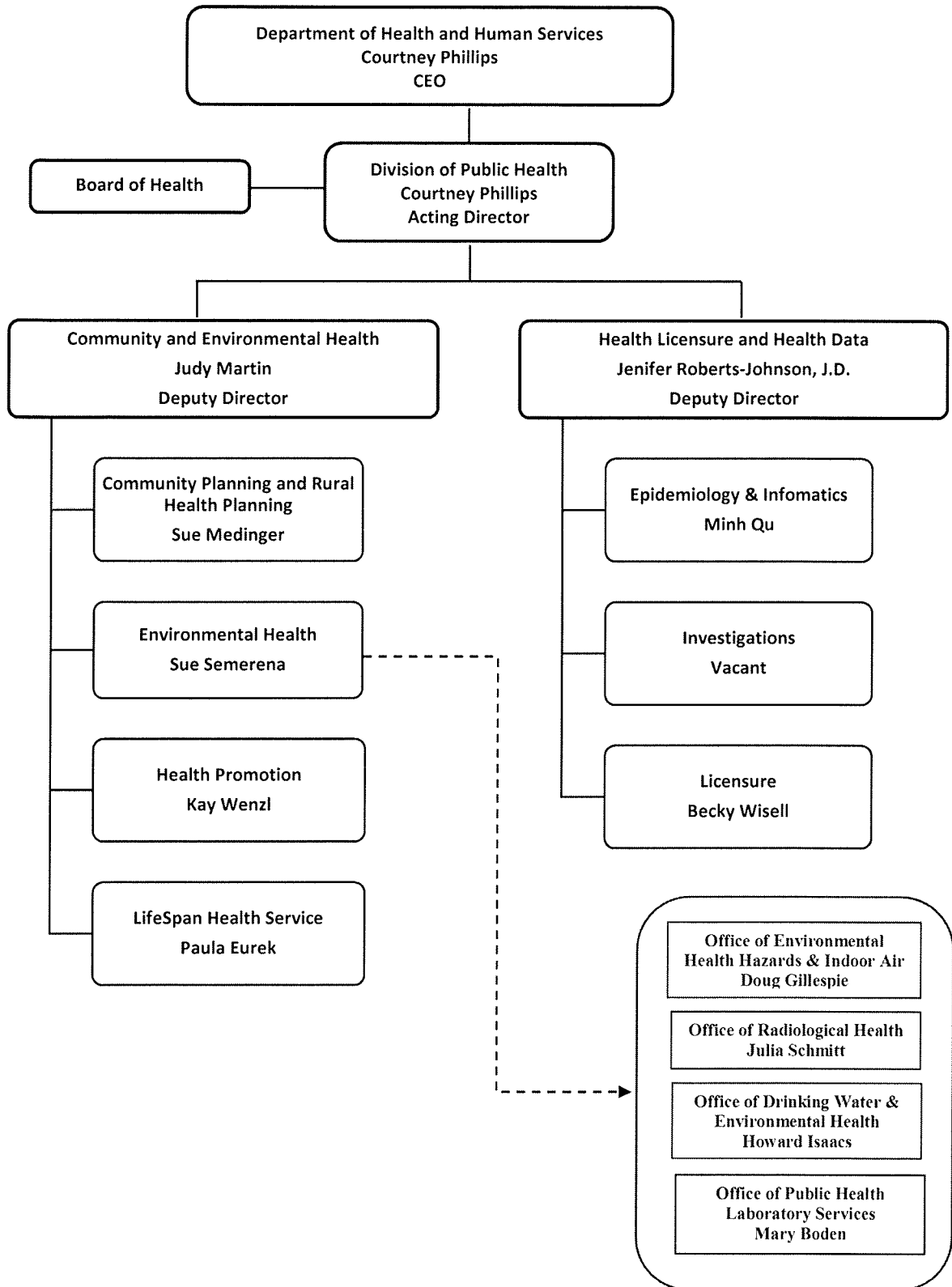
APPENDIX B

NEBRASKA HEALTH & HUMAN SERVICES SYSTEM



APPENDIX C

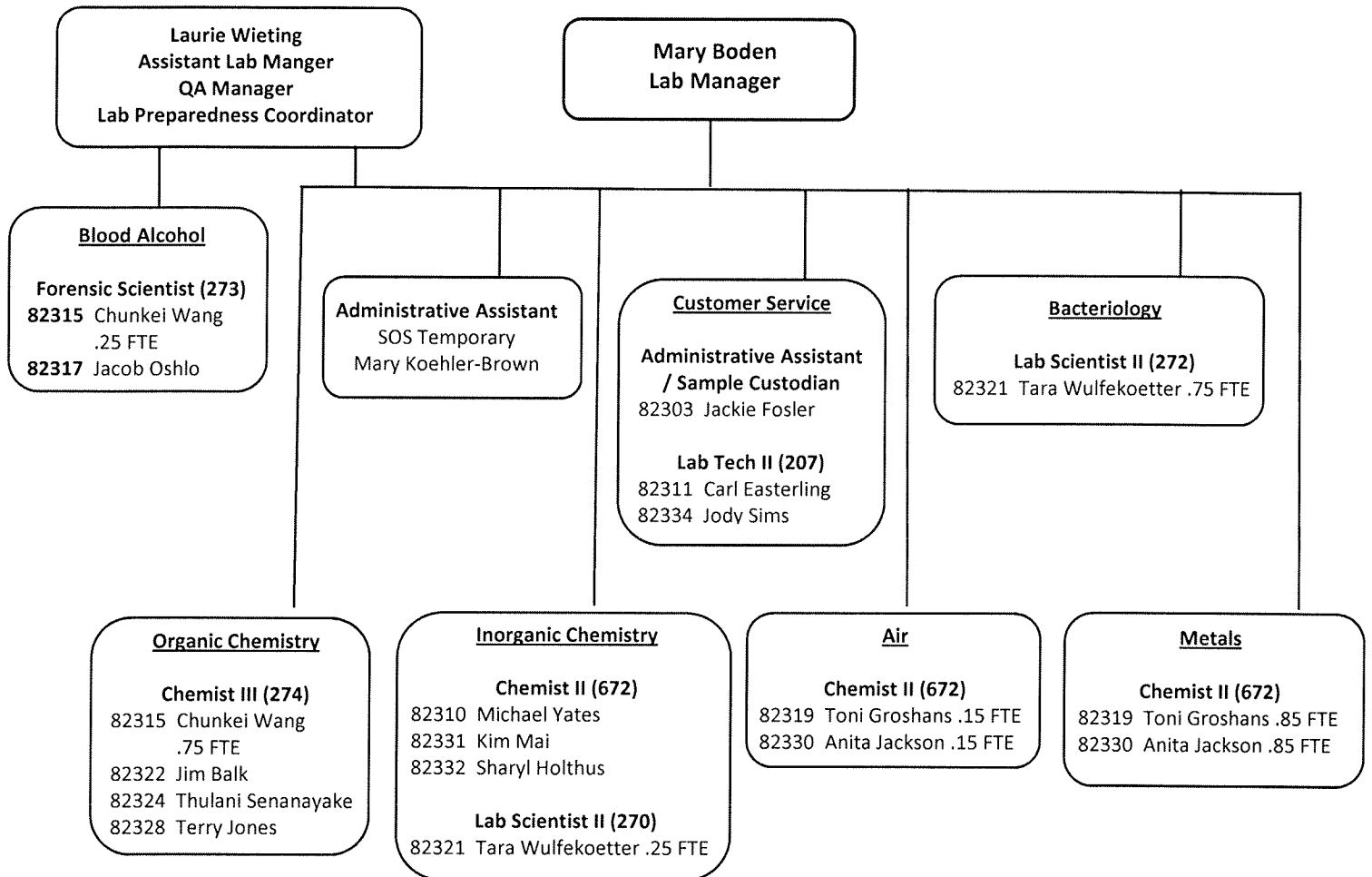
DIVISION OF PUBLIC HEALTH, MARCH 2016



APPENDIX D

Nebraska Public Health Environmental Laboratory

March, 2016



APPENDIX E

STATE OF NEBRASKA
CLASS SPECIFICATION
EST: 04/73 - REV: 01/98

CLASS CODE: S09112
SALARY GRADE: 339
OVERTIME STATUS: N

STAFF ASSISTANT II

DESCRIPTION: Under limited supervision, handles a single administrative or program operation, function, or activity in a contributory capacity with the superior and performs varied administrative, technical, and/or program support work; performs related work as required.

EXAMPLES OF WORK: (A position may not be assigned all the duties listed, nor do the listed examples include all the duties that may be assigned.)

Plans, organizes, and implements work assignments/courses of action, as directed, to meet the goals and objectives of the assigned program, technical, or administrative activities.

Collects and summarizes data from statistical, accounting, administrative, and/or other records to measure progress and to facilitate program planning.

Compiles records and/or reports to record accomplishments and/or to provide superiors with information for making decisions on workload, budgeting, and staffing.

Reviews data and interprets results to recommend policy and/or procedure changes to improve operational effectiveness.

Searches for and/or proposes solutions to questions/modifications to the structure of operational policies to increase their utility and efficiency.

Develops and implements program/administrative service monitoring/evaluation processes to provide a means for determining the effectiveness of the operation and discovering any associated problems.

Coordinates work flow and schedules office operations/support staff activities to facilitate the management of program operations.

Interprets policies, procedures, and processes pertinent to the program/administrative functions to agency staff, state and local officials, and the public to answer their inquiries and to facilitate proper application of these directives and processes.

Coordinates public information/community relations contact activities to promote positive public awareness of an administrative or program operation, function, or activity of the agency.

FULL PERFORMANCE KNOWLEDGES, ABILITIES AND SKILLS REQUIRED: (These may be acquired on the job and are needed to perform the work assigned.)

Knowledge of: the program/administrative functions assigned to the position; the organizational structure, mission, and activities of the employing agency; sources of information pertinent to the assigned functions; agency policy and procedures.

STAFF ASSISTANT II (continued)

Ability to: formulate and recommend alternative courses of action to meet organizational/operational goals and objectives.

ENTRY KNOWLEDGES, ABILITIES, AND SKILLS REQUIRED: (Applicants will be screened for possession of these through written, oral, performance, and/or other evaluations.)

Knowledge of: the principles and practices of record keeping.

Ability to: communicate orally and in writing to exchange information and ideas; promote specific needs, plans, and objectives of the agency; summarize technical data and conclusions of research and monitoring activities into reports; interpret and apply oral and written instructions, administrative policies, and program guidelines; develop program objectives, performance goals, and work priorities to carry out the assigned functions.

JOB PREPARATION GUIDELINES: (Entry knowledge, abilities, and/or skills may be acquired through, BUT ARE NOT LIMITED TO, the following coursework/training and/or experience.)

Experience in secretarial or general office work with responsibility for developing and applying office support methods and procedures.

OR

Post high school coursework/training in: office management practices or secretarial support functions, or management/administration.

APPENDIX F

STATE OF NEBRASKA
CLASS SPECIFICATION
EST: 08/70 - REV: 01/98

CLASS CODE: M53142
SALARY GRADE: 207
OVERTIME STATUS: N

LABORATORY TECHNICIAN II

DESCRIPTION: Under immediate supervision, performs repetitive, well-defined laboratory testing or analysis involving a number of steps, tests, and/or pieces of equipment and including logging or entering data, reporting findings, preparing test materials and samples, and cleaning and setting up equipment; performs related work as required.

EXAMPLES OF WORK: (A position may not be assigned all the duties listed, nor do the listed examples include all the duties that may be assigned.)

Tests or analyzes specimens and samples using chemical, microbiological, serological, or biological bench techniques and agency laboratory protocol and procedures to screen, identify, count, confirm, match, measure, or otherwise examine targeted substances or organisms.

Mixes or generates stains, culture media, solutions, and/or reagents to test or process microscopic, chemical, environmental, and/or biological specimens and samples.

Operates and cleans laboratory equipment, such as centrifuges, autoclaves, agitators, spectrophotometers, gas chromatographs, microscopes, analytical balances, volumetric glassware, ovens, incubators, pipettes, automatic pipette machines, pH meters, fluoride electrodes, titration burets, surgical instruments, and distillation equipment, to analyze, test or prepare specimens and samples.

Enters, logs, and/or inventories specimens, samples, data, or findings to record, report, or document receipt, acceptability, condition, procedures, results, and equality control results for review by senior staff members.

Fixes, sections, and stains biological specimens or tissue, in accordance with laboratory protocol, to isolate, cultivate, identify, and classify microscopic characteristics.

Compiles and calculates results of tests or analysis to determine and record findings.

Trains co-workers, as directed, in specific task and job practices and procedures of laboratory work to improve and maintain the performance levels of these employees.

FULL PERFORMANCE KNOWLEDGES, ABILITIES, AND SKILLS REQUIRED: (These may be required on the job and are needed to perform the work assigned.)

Knowledge of: agency laboratory procedures and protocol; laboratory safety and sanitation practices; chemical, biological, environmental, or microbiological methodology; agency and laboratory organization and priorities.

Ability to: operate laboratory equipment assigned; perform detailed, sequential tests and analysis on chemical or biological materials; complete laboratory reports and records.

LABORATORY TECHNICIAN II (continued)

ENTRY KNOWLEDGES, ABILITIES, AND SKILLS REQUIRED: (Applicants will be screened for possession of these through written, oral, performance, and/or other evaluations.)

Knowledge of: laboratory bench techniques; principles of chemistry or biology; the metric system of measurements; chemical, biological, or microbiological terminology; laboratory practices.

Ability to: operate laboratory equipment; identify chemical or biological substances through or for laboratory testing and analysis; fill out forms; follow oral and written instructions; calculate solutions to arithmetical problems involving addition, subtraction, multiplication, division, decimals, fractions, and percentages.

JOB PREPARATION GUIDELINES: (Entry knowledge, abilities, and/or skills may be acquired through, BUT ARE NOT LIMITED TO, the following coursework/training and/or experience.)

Experience performing laboratory bench procedures in a chemical environmental, microbiological, or biological laboratory.

OR

Post high school coursework/training in laboratory bench techniques.

APPENDIX G

STATE OF NEBRASKA
CLASS SPECIFICATION
EST: 05/70 - REV: 08/97

CLASS CODE: E53311
SALARY GRADE: 270
OVERTIME STATUS: N

CHEMIST I

DESCRIPTION: Under general supervision, conducts chemical and physical analyses, tests, and examinations of organic and inorganic materials, substances, and compounds; performs related work as required.

EXAMPLES OF WORK: (A position may not be assigned all the duties listed, nor do the listed examples include all the duties that may be assigned.)

Examines food, paint, petroleum product, metal, cement, concrete, feed, fertilizer, pesticide, environmental, animal, or human specimens or samples using chemical, physical or biochemical analysis procedures and agency laboratory protocol to determine the composition and physical properties of the specimens to screen for and identify inorganic materials or organic substances such as drugs or pesticides, or nutritionally valuable compounds and to conform the presence of any chemical health or environmental hazards.

Mixes or generates reagents, compounds, solutions, or catalysts to produce substances or controls for use in testing and/or processing organic and inorganic materials, substances, and compounds.

Operates, calibrates, and cleans or repairs laboratory instruments and equipment such as UV-visible and atomic absorption spectrophotometers, gas and liquid chromatographs, analytical balances, volumetric glassware, extraction apparatus, induction furnaces, reflex and flame photometers, or pH meters, to test, analyze, or prepare samples.

Tests new and/or improved laboratory methods and procedures to assist other chemists in assessing possible applications for the solution of technical laboratory problems.

Records or enters and documents data on daily analysis activities and findings to comply with record keeping requirements and to ensure information available for future study and/or presentation.

Writes, constructs, and compiles laboratory notes, reports, charts, quality control data, and graphs on test activities or analyses to summarize and document the results of laboratory tests.

Operates or calibrates computerized instruments such as the gas chromatograph-mass spectrometer or gamma spectrometer to perform multiple interaction analyses of samples.

Interprets read-outs, or other instrument data to determine or analyze results of chemical or physical tests and analyses.

Monitors and reports the work performance of co-workers to determine overall conformity to established timetables and quality standards and to document and communicate employee production levels and training needs.

Trains co-workers, as directed, in specific task and job practices and procedures of laboratory chemistry to improve and maintain the performance levels of these employees.

CHEMIST I (continued)

FULL PERFORMANCE KNOWLEDGES, ABILITIES, AND SKILLS REQUIRED: (These may be acquired on the job and are needed to perform the work assigned.)

Knowledge of: state law and rules and agency policies, procedures, and standards governing the analysis of organic and inorganic materials; information sources and research literature pertinent to agency chemical analysis functions.

Ability to: apply laboratory testing and analysis procedures and methods; summarize findings and conclusions of tests and analyses into technical laboratory reports; compare the specifications of laboratory equipment and material to agency product standards; use and maintain agency laboratory supplies, instruments, equipment, and apparatus; learn the operation of computer operated/controlled laboratory equipment including interpretation of the resulting data.

ENTRY KNOWLEDGES, ABILITIES, AND SKILLS REQUIRED: (Applicants will be screened for possession of these through written, oral, performance, and/or other evaluations.)

Knowledge of: the principles, methods, practices of chemistry and biochemistry; the principles and practices of scientific methodology; the procedures, equipment, materials, and facilities of laboratory testing; the hazards and safety precautions of laboratory testing activities; analytical chemistry.

Ability to: communicate orally and in writing to exchange technical and scientific information; interact with other chemists, laboratory staff, and the public; understand and apply oral and written supervisory instructions, equipment operation manuals, and safety rules and instructions; apply chemical analysis principles and technical practices and standards in a laboratory setting; calculate solutions to mathematical and statistical problems; observe and identify characteristics or patterns in substances and compounds; extract and interpret findings from laboratory tests and analyses; set personal work priorities and manage own work time.

JOB PREPARATION GUIDELINES: (Entry knowledge, abilities, and/or skills may be acquired through, BUT ARE NOT LIMITED TO, the following coursework/training and/or experience.)

Post high school coursework/training in chemistry or biochemistry, including coursework in analytical chemistry.

APPENDIX H

STATE OF NEBRASKA
CLASS SPECIFICATION
EST: 08/70 - REV: 07/01

CLASS CODE: E53312
SALARY GRADE: 672
OVERTIME STATUS: N

CHEMIST II

DESCRIPTION: Under limited supervision, examines and analyzes organic and inorganic materials, substances, and compounds and trains, advises, and provides work guidance to other laboratory staff on chemical analysis procedures, standards, and findings; performs related work as required.

EXAMPLES OF WORK: (A position may not be assigned all the duties listed, nor do the listed examples include all the duties that may be assigned.)

Analyzes samples and specimens in accordance with the principles of qualitative and quantitative analysis and agency protocol, to screen for, assay compare and/or identify inorganic materials and organic substances such as drugs, pesticides, antibodies, vitamins, or minerals; to assess the scope of any health or environmental chemical hazards; or to identify a common source.

Reviews and evaluates published chemical analytical procedures and methods to determine recommendations to laboratory supervisors regarding inclusion in official laboratory protocol and adaptations to current laboratory instrumentation.

Evaluates laboratory-related commercial products such as reagent test kits to determine conformance with agency product standards and to develop data for use in making purchasing decisions.

Advises laboratory staff and officials of other public and private agencies on test results and interpretation in chemical analysis specialties to explain and ensure the proper application of specific technical laboratory procedures.

Compiles and interprets chemical and/or physical data to develop conclusions on the structure, composition, and properties of materials and the significance of these characteristics.

Schedules, coordinates, distributes/balances, and guides the work assignments of other laboratory staff, in accordance with established work flow/assignment requirements, to assist in the accomplishment of the assigned workload.

Monitors, reviews, and reports the work performance of other laboratory staff to ensure effective and consistent application of chemical test and analysis procedures and standards, determine overall conformity to established timetables, and to document and communicate employee production levels and training needs.

Trains other laboratory staff engaged in conducting analyses to improve employee performance levels and to continue and improve the accuracy of analyses. Operates and/or calibrates computerized instruments such as the gas chromatograph-mass spectrometer to perform multiple interactional analyses of samples.

Interprets read-outs, printouts, or other instrument data to determine or analyze results of chemical or physical tests and analyses.

Testifies at judicial and/or administrative hearings involving the consideration of chemical analyses to explain, interpret and provide information on the findings and conclusions of laboratory tests.

CHEMIST II (continued)

Writes and compiles laboratory reports, correspondence, or scientific papers to document significant analyses methods or findings.

Writes, constructs, and compiles laboratory notes, charts, quality control data, and graphs on test activities or analyses to summarize and document the results, conditions, and procedures of laboratory tests.

Operates, calibrates, and repairs laboratory instruments and equipment such as UV-visible and atomic absorption spectrophotometers, gas and liquid chromatographs, analytical balances, volumetric glassware, extraction apparatus, induction furnaces, reflex and flame photometers, ph-meters, technician auto-analyzers, selective ion meters, conductivity meters and/or radiochemical analysis instruments, to test, analyze, or prepare samples.

FULL PERFORMANCE KNOWLEDGES, ABILITIES, AND SKILLS REQUIRED: (These may be acquired on the job and are needed to perform the work assigned.)

Knowledge of: state law and rules and agency policies, procedures, and standards governing the analysis of organic and inorganic materials; information sources and resource literature pertinent to agency chemical analysis functions; techniques of training and leading others.

Ability to: design and evaluate agency laboratory testing and analysis procedures, guidelines, and standards; compare the specifications of laboratory equipment, instruments, and materials to agency product standards; advise representatives of other organizations and local agencies on the technical practices and standards of a laboratory function; instruct other laboratory staff in the policies, procedures, and standards of a laboratory function.

ENTRY KNOWLEDGES, ABILITIES, AND SKILLS REQUIRED: (Applicants will be screened for possession of these through written, oral, performance, and/or other evaluations.)

Knowledge of: the principles, practices, and methods of chemistry and biochemistry and their application in a laboratory setting; the principles and practices of scientific methodology; the procedures, equipment, instruments, and facilities of laboratory testing; the hazards and safety precautions of laboratory testing activities; research literature in chemical analysis; chemical analysis techniques.

Ability to: operate computer operated/controlled laboratory instruments including interpretation of the resulting data; communicate orally and in writing to exchange technical and scientific information and to interact with other chemists, laboratory staff, and the public; comprehend and apply oral and written supervisory and administrative instructions, equipment operation manuals, and safety rules and instructions; calculate solutions to mathematical and statistical problems; use and maintain laboratory supplies, instruments, and apparatus; apply and modify laboratory testing and analysis procedures and methods; observe and identify characteristics or patterns in substances and compounds; extract and interpret findings from laboratory tests and analyses; summarize findings and conclusions of tests and analyses into technical laboratory reports; instruct other laboratory staff in the policies, procedures, and standards of laboratory testing and analysis; set personal work priorities and manage own work time.

JOB PREPARATION GUIDELINES: (Entry knowledge, abilities, and/or skills may be acquired through, BUT ARE NOT LIMITED TO, the following coursework/training and/or experience.)

Post high school coursework/training in chemistry or biochemistry AND experience in an applied testing laboratory with responsibility for chemical analysis.

APPENDIX I

STATE OF NEBRASKA
CLASS SPECIFICATION
EST: 09/78 - REV: 08/97

CLASS CODE: E53313
SALARY GRADE: 274
OVERTIME STATUS: N

CHEMIST III

DESCRIPTION: Performs responsible supervisory and scientific work in directing the activities of a large state laboratory or laboratories. Performs related work as required.

EXAMPLES OF WORK: (A position may not be assigned all the duties listed, nor do the listed examples include all the duties that may be assigned.)

Supervises and participates in the chemical and/or physical testing and analysis of foods and/or materials such as feeds, fertilizers, agricultural chemicals, drugs, paints, petroleum products, metals, cements or concrete products.

Directs, supervises and participates in research programs.

Prepares or assists in the preparation of specifications for materials and equipment to be purchased by the state.

Develops new and improved testing procedures and apparatus.

Supervises the work of and makes work assignments for personnel of assigned laboratory or laboratories.

Directs and participates in in-service training programs.

Directs, prepares and maintains reports, records and correspondence related to assigned area.

May prepare manuals and guidelines on materials and test procedures.

May assist in preparation of the budget for assigned area.

May coordinate the work of outside agencies performing related testing for the state.

FULL PERFORMANCE KNOWLEDGES, ABILITIES, AND SKILLS REQUIRED: (These may be acquired on the job and are needed to perform the work assigned.)

ENTRY KNOWLEDGES, ABILITIES, AND SKILLS REQUIRED: (Applicants will be screened for possession of these through written, oral, performance, and/or other evaluations.)

JOB PREPARATION GUIDELINES: (Entry knowledge, abilities, and/or skills may be acquired through, BUT ARE NOT LIMITED TO, the following coursework/training and/or experience.)

Bachelor's degree with major in chemistry plus seven to ten years experience in chemical testing and analysis including supervisory experience; or Master's degree in chemistry plus five to seven years experience in chemical test and analysis; or Doctorate in chemistry plus one to three years related experience; demonstrated excellence in supervisory and leadership capabilities.

APPENDIX J

STATE OF NEBRASKA
CLASS SPECIFICATION
EST: 08/70 - REV: 08/97

CLASS CODE: E53211
SALARY GRADE: 270
OVERTIME STATUS: N

LABORATORY SCIENTIST I

DESCRIPTION: Under general supervision, conducts tests and examinations involving biological, microbiological, and other scientific applications and analyzes human or animal specimens; performs related work as required.

EXAMPLES OF WORK: (A position may not be assigned all the duties listed, nor do the listed examples include all the duties that may be assigned.)

Examines human or animal specimens such as blood, urine, feces, secretions, excretions, tissues, and bodily fluids using hematological, biochemical, immunological, serological or other laboratory prescribed tests to determine the composition and the biological and physical properties of the specimens.

Examines environmental samples such as recreation waters, natural waters, drinking water, or air using laboratory prescribed examinations to determine the physical properties and to characterize the biological and/or microbiological nature of the sample.

Examines micro-organisms using microscopic and biochemical testing principles and agency protocol to screen for the identifying pathogens, to assess the scope of the health hazard, and to determine the immunizing agents.

Tests and/or analyzes food, feed, or seed samples to determine the presence of harmful bacteria or other micro-organisms, the physical or biochemical structure, and/or the presence or absence of viability or harmful or nutritionally valuable compounds.

Tests new and/or revised laboratory methods and procedures to assist laboratory staff in verifying suitability of methods or material for meeting laboratory assignment requirements.

Enters, logs, and/or inventories specimens and samples to record and document receipt, acceptability, and condition.

Fixes, sections, and stains biological specimens or tissue to provide means for isolating, cultivating, identifying, and classifying the microscopic characteristics of a specimen.

Mixes stains, culture media, solutions, and reagents to produce materials or controls for use in testing and/or in processing microscopic and biological specimens.

Writes or enters laboratory notes on bench worksheets, laboratory logs, computer terminals, or quality control sheets to record the results or data of laboratory tests and to provide information for laboratory records management.

Constructs charts and graphs on examination findings or activities to record and summarize the results or data of laboratory tests.

LABORATORY SCIENTIST I (continued)

Writes and compiles laboratory reports for return to the person or agency requesting the test of the specimen to provide a written response to requests for testing.

Cleans, calibrates, operates, and/or repairs laboratory instruments such as spectrophotometers, incubators, microscopes, centrifuges, or autoclaves according to laboratory protocol to ensure that the apparatus is properly maintained and available for future use.

Trains co-workers, as directed, in specific job and task practices and procedures of laboratory work to improve and maintain the performance levels of these employees.

Monitors and reports on the work performance of co-workers to determine overall conformity to established timetables and quality standards and to document and communicate employee production levels and training needs.

FULL PERFORMANCE KNOWLEDGES, ABILITIES, AND SKILLS REQUIRED: (These may be acquired on the job and are needed to perform the work assigned.)

Knowledge of: state law and regulations and agency policies, procedures, and standards governing laboratory analysis functions; the testing procedures, laboratory protocol, equipment, material, and facilities of the agency laboratory; information sources and research literature pertinent to agency biological and microbiological analysis functions.

Ability to: use and maintain agency laboratory supplies, instruments, and apparatus; apply laboratory testing and analysis procedures and guidelines; extract and interpret findings from laboratory examinations; summarize examination findings into technical reports and graphics.

ENTRY KNOWLEDGES, ABILITIES, AND SKILLS REQUIRED: (Applicants will be screened for possession of these through written, oral, performance, and/or other evaluations.)

Knowledge of: the principles of biology and microbiology and their laboratory applications; the principles, concepts, and techniques of applied laboratory testing; the hazards and safety precautions of laboratory testing activities.

Ability to: perform microbiological examinations; communicate orally and in writing to present technical and scientific findings, conclusions, and recommendations; interact with other laboratory staff to exchange information; understand and apply oral and written supervisory instructions, the protocol for equipment operation and test procedure, and safety rules; calculate solutions to arithmetical problems involving addition, subtraction, multiplication, division, percentages, decimals, and fractions; observe and identify characteristics or patterns in substances and fractions; observe and identify characteristics or patterns in substances and materials examined; set personal work priorities and manage own work time.

JOB PREPARATION GUIDELINES: (Entry knowledge, abilities, and/or skills may be acquired through, BUT ARE NOT LIMITED TO, the following coursework/training and/or experience.)

Post high school coursework/training in biology, microbiology, or other biological/life sciences or medical technology.

APPENDIX K

STATE OF NEBRASKA
CLASS SPECIFICATION
EST: 08/70 - REV: 08/97

CLASS CODE: E53212
SALARY GRADE: 272
OVERTIME STATUS: N

LABORATORY SCIENTIST II

DESCRIPTION: Under limited supervision, conducts biological, micro biological, and other tests and analyses; provides work guidance and training to other laboratory staff; and advises other laboratory staff on laboratory analysis procedures, standards, and findings; perform related work as required.

EXAMPLES OF WORK: (A position may not be assigned all the duties listed, nor do the listed examples include all the duties that may be assigned.)

Examines human and animal specimens such as blood, urine, feces, secretion, excretions, tissue, and various bodily fluids using laboratory prescribed examinations including hematological, biochemical, immunological, and serological tests to determine the composition, the biological and physical properties, and the significance of characteristics of the specimens.

Examines environmental samples such as recreation waters, natural waters, drinking water, and air using prescribed laboratory examinations to determine the physical properties and to characterize the biological and/or micro biological nature of the sample.

Examines micro-organisms using microscopic and biochemical testing principles and agency protocol to screen for the identifying pathogens, to assess the scope of the health hazard, and to determine the immunizing agents.

Tests and/or analyzes food, feed, or seed samples to determine the presence of harmful bacteria or other micro-organisms, the physical or biochemical structure, and/or the presence or absence of viability or of harmful or nutritionally valuable compounds.

Tests new and/or revised laboratory methods and procedures to verify suitability of methods or materials for meeting laboratory requirements.

Schedules, distributes/balances, and guides the work assignments of other laboratory staff, accordance with established work flow/assignment requirements, to assist in the accomplishment of the assigned workload.

Monitors and reports the work performance of co-workers to determine overall conformity to established timetables and quality standards and to document and communicate employee production levels and training needs.

Trains and advises other laboratory analysis and technical staff to improve performance levels and to provide functional assistance in solving work problems encountered.

Evaluates laboratory-testing-related biological products, such as reagent test facts, to determine conformity with agency product standards and to provide data for use in making purchasing decisions.

LABORATORY SCIENTIST II (continued)

Advises supervisory staff in updating, modifying, and adopting examination/analysis procedures and equipment to provide alternate means for solving problems and/or to ensure adherence of agency practices to state and federal regulations or the usual and customary laboratory practices published by professional or certifying organizations.

Interprets laboratory examination findings in conformity with the laboratory protocol involved and within the nominal expected value ranges, pertinent standards, and regulations, to provide a basis for making conclusions, comparisons, and recommendations and to aid the preparation of technical reports.

Enters, logs, and/or inventories laboratory specimens and samples, to record and document receipt, acceptability, and condition, in accordance with laboratory protocol.

Fixes, sections, and stains biological specimens or tissue to provide means for isolating, cultivating, identifying, and classifying the microscopic characteristics of a specimen.

Writes and compiles laboratory reports, correspondence for scientific papers to return a written response to the person or agency requesting the test of the specimen and/or to document significant findings.

Cleans, calibrates, operates, and/or repairs laboratory equipment and instruments such as spectrophotometers, incubators, microscopes, centrifuges, or autoclaves in accordance with laboratory protocol, to ensure the apparatus is properly maintained and available for future use.

Testifies at judicial and/or administrative hearings involving the consideration of biological or micro biological analyses, to explain, interpret, and provide information on the findings and conclusions of laboratory tests and comparisons.

FULL PERFORMANCE KNOWLEDGES, ABILITIES, AND SKILLS REQUIRED: (These may be acquired on the job and are needed to perform the work assigned.)

Knowledge of: state law and regulations and agency policies, procedures, and standards governing laboratory analysis functions; information sources and resource literature pertinent to agency biological and micro biological functions; the laboratory protocol, testing procedures, equipment, material, and facilities of the agency laboratory; techniques of training and leading others.

Ability to: apply and evaluate the effectiveness of agency laboratory testing or analysis procedures, guidelines, and standards; use and maintain agency laboratory supplies, instruments, and apparatus, such as centrifuges and microscopes; compare and evaluate the specifications of newly developed laboratory equipment and material with agency product standards; instruct other laboratory staff in policies, procedures, and standards of laboratory testing and analyses; guide other technical staff in meeting laboratory testing goals.

ENTRY KNOWLEDGES, ABILITIES, AND SKILLS REQUIRED: (Applicants will be screened for possession of these through written, oral, performance, and/or other evaluations.)

Knowledge of: the principles of biology and microbiology and their applications in a laboratory setting; the principles and concepts of applied laboratory testing; the hazards and safety precautions of laboratory testing activities; research literature in biology and microbiology.

LABORATORY SCIENTIST II (continued)

Ability to: communicate orally and in writing to present technical and scientific findings, conclusions, and recommendations; interact with other laboratory staff and other public or private health officials to exchange information and provide instruction or advice; understand, interpret, and apply oral and written supervisory instructions, equipment operation and test procedure protocol, and safety rules; calculate solutions to mathematical and statistical problems; observe and identify characteristics or patterns in substances and material examined; extract and interpret findings from laboratory examinations; summarize set personal work priorities and manage own work time.

JOB PREPARATION GUIDELINES: (Entry knowledge, abilities, and/or skills may be acquired through, BUT ARE NOT LIMITED TO, the following coursework/training and/or experience.)

Post high school coursework/training in: the biological/life sciences or medical technology, experience in conducting biological, micro biological, or medical laboratory examinations or analysis.

DHHS PHE Laboratory Staffing Experience and Job Description

Employee	Position	Date of Hire	Years of Related Experience	Degree or Training	Job Description
Balk, Jim	Chemist III	Apr-82	50	PhD Chemistry, BS Medical Technology	ANALYST FOR PPLU EPA METHODS 301.1, 307, 303.2 & RADON III water. Backup for EPA 515.3 and 552.2. Data reviewer for all contracted Radiological testing data, Radiation safety officer maintains radiological license, maintains radiological safety equipment & monitors lab for radiological hazards.
Boden, Mary	Lab Manager	Oct-89	27	BS Biology	In charge of general daily operations (Laboratory Manager) of the laboratory, including staffing, test scheduling, customer service processes, monitoring testing progress, providing technical expertise to staff as well as clients, and filling in for analysts as needed. In charge of the LIMS data system for the lab. Hazardous Waste Coordinator.
Easterling, Carl	Lab Tech II	May-98	19	Military	Provides customer service by preparing and snipping sampling kits to clients. Picks-up and sorts samples sent in to the laboratory for testing. Enters demographic data
Fosler, Jackie	Administrative Assistant	Aug-05	29	High School	Provides customer service by managing client data base, including receiving samples as sample custodian, entering demographics, monitoring testing status, preparing reports, mailing reports, filing requests, and provide phone assistance to clients. Help Management with paperwork, filing, entering NIS purchasing documents. Open checks.
Groshans, Toni	Chemist II	Nov-08	27	BS Biology	Analyst for AA metal analysis, Mercury, Microwave digestion, ICP/MS EPA 200.8 Metals and PM 2.5 analysis. Analyst for Colliert and HPC.Backup analyst for EPA 552 and EPA 515 and a few miscellaneous inorganic methods.
Holthus, Sharyl	Chemist II	Jun-96	22	AS Bio-Technology	Analyst for a variety of miscellaneous inorganic tests, including TDS, TSS, Alkalinity, Total Hardness, pH, Total Residual Chlorine, Conductivity, Turbidity, SSC and COD. Also analyst for Lachat methods, including Nitrate, Nitrite, Chloride, Fluoride, Ortho Phosphate. Analyst for Colliert and HPC.
Jackson, Anita	Chemist II	Jan-09	31	BS Life Science & MS Agronomy	Analyst for ICP/MS metals by EPA 200.8 as well as analyst for AA metal analysis, Mercury, Microwave digestion, PM 2.5 analysis, Colliert, and HPC. Analyst backup for a few inorganic methods.
Jones, Terry	Chemist III	Oct-85	32	BS Chemistry	Primary analyst for Synthetic Organic Compounds using EPA Method 525.2, EDB's and DBCP by EPA 504.1, and PCB's, & Toxaphene by EPA 505. Backup for VOC's using EPA Method 524.2.

DHHS PHE Laboratory Staffing Experience and Job Description

Employee	Position	Date of Hire	Years of Related Experience	Degree or Training	Job Description
Mai, Kim	Chemist II	Dec-85	31	AS Environmental Technology	Analyst for Colliert & HPC. Analyst for Nitrate, Nitrite, Total Kjeldahl Nitrogen, & Total Phosphorus using the Lachat 8000. Analyst for all other Lachat methods as well as Conductivity, pH, Residual Chlorine, Sulfate, TDS, TSS, Alkalinity, Turbidity, Demands and Total Hardness. Also provide backup for AA Metals, including a variety of minerals and Mercury, using SM 311B, SM 312B, and EPA 3015 for Microwave Digestion. Primary analyst for Blood Alcohol Testing for State of Nebraska Law Enforcement using automated Headspace GC technology.
Reisen, Christine	Forensic Scientist	Sep-16	26	BS Medical Technology	Provides customer service by preparing and snipping sampling kits to clients. Picks-up and sorts samples sent in to the laboratory for testing. Sample Custodian and demographic data entry back-up.
Sims, Jody	Tech II	Mar-04	24	High School PhD, MS, & BS in Chemistry	Primary analyst for Purgable Volatile Organics using EPA Method 524.2, Backup for radon
Thulani Senanayake	Chemist III	Jun-15	6		Primary analyst for EPA 515.3 and 552.2
Wang, Chunkai	Chemist III Laboratory Biopreparedness Coordinator Assistant Lab Manager	May-16	4	PhD Medicinal Chemistry	
Wieting, Laurie	Assistant Lab Manager	Jul-78	39	BA Medical Technology & Biology	Coordinator and primary analyst for Select agent BSL III Lab section. Report administrative reviewer and backup for LIMS processes. Assistant Laboratory Manager, QA Manager
Wulfkoetter, Tara	Lab Scientist II	Oct-04	15	BS Biology	Primary analyst for Coliform & E.coli by Coliort, Fecal Coliform, Heterotrophic plate counts using the Simplate Method, BOD/CBOD, Fecal Strep, Cyanide and Sulfate. Inorganic area analyst for IDS, pH, Nitrite, Chloride, Nitrate/Nitrite, Fluoride, Ammonia, Ortho Phosphate, TKN, TSS, and TPO4
Yates, Michael	Chemist II	Jan-13	13	BS Biochemistry	

Laboratory Staffing Test Method Listing

Analyte	Method #	Equipment Used	SOP(S)#	Analysts Signed Off On Method
Air 2.5 Customer Service	Air 2.5 Customer Service	NA	NA	Carl Easterling, Jody Sims, Jackie Fosler
Air 2.5 Processing	Air 2.5 Processing EPA 350.1 & 350.2	Sartorius MC5 Microbalance	9200.1	Anita Jackson, Toni Groshans
Ammonia		Lachat 8500	4110.2	Michael Yates, Kim Mai, Sharyl Holthus
Blood Alcohol	Title 177	Agilent HP 6890 Headspace GC/MS	3230.1, 3240.1 3260.1	Laurie Wieting
Blood Alcohol	Title 177	Agilent 7890 Headspace GC/MS		Laurie Wieting
BOD	EPA 405.1	YSI Oxygen Meter	3900.1	Tara Wulfekoetter, Kim Mai, Mary Boden, Michael Yates
Carbamate	EPA 531.1	Agilent HP 1100 FLD2	3310.1	Jim Balk
CBOD	EPA 405.1 EPA 325.2	YSI Oxygen Meter	3900.1	Tara Wulfekoetter, Kim Mai, Mary Boden, Michael Yates
Chloride	SM4500-CL-E	Lachat 8500	4170.2	Michael Yates, Kim Mai, Sharyl Holthus
COD	EPA 410.4	Hach DR4000U UV/VIS	3800.1	Sharyl Holthus, Kim Mai, Anita Jackson, Mary Boden
Colilert	SM 9223B	NA	6440.1	Tara Wulfekoetter, Kim Mai, Sharyl Holthus, Anita Jackson, Toni Groshans, Michael Yates, Mary Boden
Conductivity	EPA 120.2 SM2510B	Hach Conductivity Meter	6300.2	Sharyl Holthus, Kim Mai, Toni Groshans, Michael Yates, Mary Boden

Laboratory Staffing . est Method Listing

Analyte	Method #	Equipment Used	SOP(S)#	Analysts Signed Off On Method
Customer Service Billing	NA	NA	NA	Laurie Wieting, Mary Boden
Service Sample Custodian	NA	NA	1910.1 1920.1	Jackie Fosler, Laurie Wieting, Mary Boden, Sharyl Holthus, Kim Mai, Jody Sims, Carl Easterling
Customer Service Data Entry	NA	NA	1900.1	Jackie Fosler, Laurie Wieting, Mary Boden, Carl Easterling, Jody Sims
Customer Service Mail	NA	NA	NA	Carl Easterling, Jody Sims, Jackie Fosler
Service Reporting	NA	NA	1800.1	Jackie Fosler, Laurie Wieting, Mary Boden,
Service Sample Log-In	NA	NA	1800.1	Jackie Fosler, Laurie Wieting, Mary Boden, Carl Easterling, Jody Sims and all Bacti staff
Cyanide by ISE	SM 4500-CN-F	NA	4180.3	Tara Wulfekoetter, Kim Mai, Anita Jackson
Diquat & Paraquat	EPA 549.2	Agilent HP 1100 DAD1	3330.2	Jim Balk
EDB & DBCP	EPA 504.1	Agilent HP GC 6890	3620.1	Terry Jones, Mary Boden
Fecal Coliform	SM 9222D	NA	6410.1	Tara Wulfekoetter, Anita Jackson, Toni Groshans, Kim Mai, Michael Yates, Sharyl Holthus
Flame AA	SM 3111B	Perkin-Elmer 300	2210.2, 2220.1, 2230.1, 2240.1, 2330.1, 2330.2	Toni Groshans, Anita Jackson,
Fluoride	SM 4500-F-C	Lachat 8500	4100.2	Michael Yates, Kim Mai, Sharyl Holthus
Glyphosate	EPA 547	Agilent HP 1100 FLD2	3320.1	Jim Balk

Laboratory Staffing Test Method Listing

Analyte	Method #	Equipment Used	SOP(S)#	Analysts Signed Off On Method
Haloacetic Acids	EPA 552.2	Agilent HP GC 6890	3650.1	Toni Groshans, Jim Balk, Mary Boden
Herbicides	EPA 515.3	Agilent HP GC 6890	3610.2	Jim Balk, Toni Groshans, Mary Boden, Chunkai Wang
HPC (Simplat)	SM 9215B	NA	6450.1	Tara Wulfekoetter, Anita Jackson, Sharyl Holthus, Laurie Wieting, Kim Mai, Toni Groshans
ICP-Metals	EPA 200.8 EPA 245.1, 245.2, 245.5 SM 3112B	Perkin-Elmer 6100 GC/MS	2800.1	Anita Jackson, Toni Groshans
Mercury		Cetac Mercury Analyzer	2400.3	Toni Groshans, Anita Jackson, Kim Mai
Microwave	EPA 3015	CEM Mars 5	2170.1	Toni Groshans, Anita Jackson, Kim Mai, Tara Wulfekoetter
Nitrate/Nitrite	EPA 353.2	Lachat 8500	4120.2	Kim Mai, Sharyl Holthus, Michael Yates
Nitrite	EPA 353.2	Lachat 8500	4210.2	Kim Mai, Sharyl Holthus, Michael Yates
Ortho-Phosphate	EPA 365.1	Lachat 8500	4140.2	Michael Yates, Kim Mai, Sharyl Holthus
pH	EPA 150.1 SM 4500-H-B		6100.1	Sharyl Holthus, Michael Yates, Kim Mai, Toni Groshans
Radon	SM 7500-RN EPA 913.0 EPA 330.5	Packard Liquid Scintillation System	3110.1	Jim Balk, Thulani Senanayake
Residual Chlorine, Total	HACH 8167SM 4500-Cl-G	NA	4230.1	Sharyl Holthus, Kim Mai
Sample Disposal	NA	NA	7400.1	Anyone
SOC's	EPA 525.2 EPA 375.4	Thermo-Finnegan Polaris Q GC/MS Agilent GC/MS	3730.1	Terry Jones
Sulfate	SM4500-SO4-E	Shimadzu 2401 UV/VIS	4160.3	Tara Wulfekoetter, Kim Mai
SSC	ASTM D3977-97	NA	6230.1	Sharyl Holthus, Kim Mai, Anita Jackson

Laboratory Staffing Test Method Listing

Analyte	Method #	Equipment Used	SOP(S)#	Analysts Signed Off On Method
TDS	EPA 160.1 SM2540C	NA	6220.1	Sharyl Holthus, Michael Yates, Kim Mai, Mary Boden
TKN	EPA 351.2	Lachat 8500	4130.2	Kim Mai, Michael Yates, Sharyl Holthus, Anita Jackson
Total Alkalinity	EPA 310.1 SM 2320B	NA	4190.1	Sharyl Holthus, Kim Mai, Michael Yates
Total		Thermo DSQ / Agilent	3710.1	Thulani Senanayake, Terry Jones
Halomethanes	EPA 524.2 SM 2340C			
Total Hardness	EPA 130.2	NA	6500.1	Sharyl Holthus, Kim Mai, Michael Yates
Total				
Phosphorus	EPA 365.4	Lachat 8500	4150.2	Kim Mai, Michael Yates, Sharyl Holthus, Anita Jackson
Toxaphene & PCB's	EPA 505	Agilent HP GC 6890	3630.1	Terry Jones, Mary Boden
TSS	EPA 160.2	NA	6210.1	Sharyl Holthus, Kim Mai, Michael Yates, Mary Boden
Turbidity	EPA 180.1 SM 2130B	Hach 2100 AN Turbidimeter	6600.2	Anita Jackson & Toni Groshans in Metals Sharyl Holthus, Kim Mai, Michael Yates in Inorganics
VOC's	EPA 524.2	Thermo DSQ / Agilent GC/MS	3710.1	Thulani Senanayake, Terry Jones
Management of Lab Waste	NA	NA	7300.1	Mary Boden, Michael Yates

APPENDIX M1

**INITIAL DEMONSTRATION OF CAPABILITY
CERTIFICATION STATEMENT**

Analyst _____ Date _____

Instrument/Make/Model _____

Matrix _____

Method # _____ SOP# _____

Parameter(s) or class of analytes: _____

We the undersigned, CERTIFY that:

1. The analyst identified above, using the cited test method, which is in use at this facility for the analyses of samples under the United States Environmental Protection Agency (EPA) or National Environmental Laboratory Accreditation Program (NELAP), has met the Initial Demonstration of Capability.
2. The test method was performed by the analyst identified on this certification.
3. A copy of the test method and the Laboratory specific SOPs are available for all personnel on site.
4. The data associated with the demonstration capability are true, accurate, complete and self-explanatory.
5. The following must be performed and documented prior to analysis of "real world environmental samples and the completion of this IDC:
 - A. Reagent Blank must contain analyte of interest at a concentration no greater than half the RL
 - B. Accuracy (mean recovery of a minimum of 4 LFB samples), must be within method limits,
 - C. Precision (%RSD relative standard deviation), must be within method limits,
 - D. MDL study must meet MDL study requirements (See the back of this form for MDL requirements),
 - E. Pass an unknown PT or blind sample,
 - F. SOP must be reviewed and/updated if changes are needed.
6. All raw data (including a copy of this certification form) necessary to reconstruct and validate these analyses have been retained at the facility, and that the associated information is well organized and available for review by authorized assessors.
7. The certification form will be kept in the analyst's training file in the QA office. The IDC data will be kept on file in the QA office. All raw data will be stored with the analyst's records.

Analyst Name and Title	Signature	Date
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QA Managers Name	Signature	Date
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MDL Requirements

MDLs Considerations:

1. The lowest standard should be approximately equal to the estimated limit of quantitation.
2. For most inorganic analyses, the blank should be included as a point on the calibration curve. It is not acceptable to force any calibration curve through zero.

Choosing Spike Level:

1. The best spiking level is 1-5 times the estimated detection level, as specified in the procedure.
2. Consider the signal response that the spiked level will give on the system that is used
3. Is the signal off scale?
4. Is the signal distinguishable from the background noise? It is recommended to have an S/N ratio of 2.5 to 10. $S/N_{est} = X_{ave} / S$
where X_{ave} = avg of either calculated concentrations or analytical signals
 S = sample standard deviation of the replicates
5. Consideration of the signal to noise ratio (S/N) may help you choose the appropriate spike level
6. The calculated MDL must be $> 1/10$ of the spike level.
7. If the calculated MDL exceed the spike level it is not statically possible to differentiate the spiked sample from a blank.
8. **WAY TO CHECK YOUR SPIKE LEVEL Calculated MDL < Spike Level < 10 X Calculated MDL**

Replicate Sample Preparation:

1. Requires a minimum of 7 replicates of a sample at the appropriate concentration. Use 8 replicates if you think you may need to toss out one as an outlier
2. Samples must be processed exactly as prescribed in the method. Using unprocessed samples is unacceptable and is not representative of the true MDL.
3. Reagent water MDLs for most environmental samples should be calculated by preparing a single stock solution and splitting it at least into seven replicates. Impractical for many procedures so can also prepare and process each sample individually.
4. It is recommended that you validate each matrix specific (ex. soils) MDL by preparing and analyzing a single matrix spike at the MDL concentration to see if the analytical system can distinguish the sample from the blank.
5. In order to account for day to day variability, analyze the seven or more replicate standards in different sample batches on different analysis dates. Cert. Manual requires that it be made over a period of at least 3 days.

Analyzing Blanks:

1. At least one method blank should be analyzed with each set of MDL samples to measure background contamination.
2. It is not acceptable to subtract blanks for methods that do not allow subtraction for ordinary samples.

Calculations:

1. Always use the sample standard deviation
2. Always use the correct Student t-value at the 99% level. For 7 replicates this is 3.14
3. Always use all significant figures through the calculation and round the final MDL to the number of digits used when reporting results for the method. It is acceptable to round the calculated value up to the nearest decimal place. It should never be rounded down unless you can routinely achieve the rounded value.
4. $MDL = (t\text{-value})(\text{standard deviation of the samples})$
5. The MDLs should be within 50% of each other when there are multiple analysts/instruments. Always report the highest calculated MDL. Can modify the F-Ratio test in 40 CFR Part 136 to test reasonableness of considering two MDL determinations equivalent.

Common Sense Check:

1. Is the MDL reasonable? Perform a five point check:
 - a. Does the spike level exceed 10 times the MDL? If so, the spike level is too high. (Required)
 - b. Is the MDL higher than the spike level? If so, the spike level is too low. (Required)
 - c. Does the calculated MDL meet regulatory requirements for necessary programs? (Required)
 - d. Is the signal/noise (S/N) in the appropriate range? (Typical range is 2.5-5)
 1. An S/N less than 2.5 indicates that random error in the series of measurements is too high and the determined MDL is probably too high. In that instance the samples should be spiked at a higher level to increase the signal.
 2. An S/N greater than 10, usually indicates the spike concentration is too high and the calculated MDL is not necessarily representative of the LOD. In that instance, the samples should be spiked at a lower level to decrease the signal.
 - e. Are the replicate recoveries reasonable?

Percent Recoveries:

1. In order for the MDL to be realistic, the average %Rec for samples should be reasonable.
 $\text{Average \% Rec} = (X_{ave}/\text{spike level}) \times 100\%$ X_{ave} = the average concentration of the samples
2. **Use the limits of the LFB if not specified in the method.**

APPENDIX M2

PROFICIENCY DOCUMENTATION

FOR (method) _____

INSTRUMENT (Make/Model) _____

Type of Training:	INITIAL
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I verify that _____ has been trained and has met the requirements
(Trainee-analyst's name)

specified below for the following:

1. _____ Appropriate SOPs read and understood _____
(SOPS)
2. _____ Trainee has acquired _____ formal in-house training.
(hours)
3. _____ Trainee was observed while performing the procedure in conformance with SOP(s) delineated above.
4. _____ Trainee has successfully completed tasks with minimal supervision.
5. _____ Trainee has successfully completed an MDL Study if method requires a MDL study.
6. _____ Trainee has passed a blind or PT sample and results are attached.
7. _____ Other Specify): _____

Analyst: _____ Date: _____
(Trainee)

Approved by: _____ Date: _____
(Qualified Trainer)

Approved by: _____ Date: _____
(QA Manager)

Current Equipment List June 2016

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Description	Area	Method(s)	Mfg.	Tag #	Purchase Date	Cost	Serial or Vin #	Model#	Location	Room	PO # or Agency Req #	Lab Tag
2	AA 300 Flame	Metals	SM3111B, SM3112B	Perkin-Elmer	No Tag	Feb-01	28,634.88	041S1020128	300	Metals	143	PO 160125	1
3	AA 300 NT Controller Assy	Metals	SM3111B, SM3112B	Perkin-Elmer	Not Tag	Feb-01	5,058.00	2GQCB01	Dell GX110/M	Metals Located in AA 300 Flame	143		1B
4	Alpha/Beta Gamma survey monitor	BT	varied	Camberra	No Tag	Nov-07	550.00	MCB2140 source 0506817 monitor	EM77022	BT	Rad Chem	500318	
5	Aqua tek 70 autosampler & Tekmar 3100	VOC's	EPA Method 524.2	Tekmar-Dohrmann	No Tag	Sep-99	25,649.00	99210013 for 3100 99195005 for aqua tec 70	14-3100-000 14-AA70-400	Organic	4	PO 157568	2
6	Aqua tek 70 autosampler & Tekmar 3100	VOC's	EPA Method 524.2	Tekmar-Dohrmann	No Tag	?	?	00171007 for 3100 00111014 for aqua tec 70	14-3100-000 14-AA70-400	Organic	4	Included in Construction Contract	3
7	Autoclave, Pass through	BSL III Lab	Varied	Primus	No Tag	Jun-05	68,463.00	16494	PSS5-A-MSSD	BSL III Lab	2	525846 OP	4
8	Autoclave w/PRI-Saver	Bacti/Metals	Varied	Primus	20P200015	Apr-14	33,432.12	18080	PSS5-A-MSSD	Dishroom	131		
9	Bacti Cinerator	BSL III Lab	Micro	Kendall	No Tag	Jun-04	208.63	K0413032	IV	BSL III Lab	2	184	
10	Balance Mettler	Pipet Calibration	Varied	Mettler	10427	Jun-89	1,316.00	120694	AE100	Organics	29	HL70118	
11	Balance Mettler PM480 Delta Range	Bacteriology	Varied	Mettler	No Tag	?	<500.00	1113100046	PM480	Bacti	38		
12	Balance, Galaxy Mettler PM480	Organics	Organics	Unknown	9417	Oct-94	1,478.15	Unknown	GT410 E	Organics	31		
13	Balance, Mettler	Metals	Metals	Mettler	20P9960	UK	UK	2113384580	PB3001	Box in room 6	140	From Butte LLW Lab Tag 9960	
14	Balance, Mettler AE100	Inorganics	Varied	Mettler	20P10433	Jun-90	1,581.12	K09297	AE100	Inorganics	35b	HL70055	
15	Balance, Mettler Toledo	Inorganics	Varied	Mettler	20P100157	Apr-06	3,242.28	1127071457	XS204	Inorganics	35b	87645-OP	
16	Balance, Mettler Toledo	Pipet Calibration	Pipet Cal	Fisher	20P200005	Sep-08	2,234.64	1129323433	XS64	Organic	29	227286OP	
17	Balance, Mettler Toledo	BSL III Lab	Varied	Mettler	No Tag	Jun-04	3,555.00	1125253687	PR2003 Delta Range	BSL III Office	25	HL0400212	5
18	Balance, PE 3600	Organics	Varied	Perkin Elmer	No Tag	UK	UK	UK	3600		31	HL 50137	
19	Balance, Sartorius	Extra	Extra	Sartorius	1160	Jun-76	1,014	2510076	2432	Metal Prep under counter	140		
20	Balance, Sartorius MCS Microbalance & printer	Air PM 2.5 & Air PM 10	Air PM 2.5 & Air PM 10	Sartorius	No Tag	May-98	12,204.49	80404492	MC-5	Air	Air Room	Agency Req 3426	6
21	Barnstead Nanopure UV distiller	Organics	Varied	ThermoLyne	No Tag	Dec-00	3,375.00	1191001178359 113-9001178359	D11911	Varied	4		7
22	Block Digester:Easy Digest 40/20	TKN	EPA 351.2	Westco Scientific Instruments	20P100074	Aug-03	5041.70	1306	AD40	Latchat	34	HSL0300305	
23	Block Digester:Easy Digest 40/20	TKN	EPA 351.2	Westco Scientific Instruments from IRAMA Corp	20P100185	Aug-07	5210.67	1402	AD40	Latchat	34	166207OP	
24	BOD Incubator #5	BOD	EPA 405.1	VWR	No Tag	Jan-02	4,957.36	1100300	2030	Inorganics	34	HSL0000443	8
25	BOD, YSI Oxygen Meter	BOD	EPA 405.1	YSI	No Tag	Apr-01	1013.00	00C0957	52	Inorganics	34	HL0000126	

Current Equipment List June 2016

	A	B	C	D	E	F	G	H	I	J	K	L	M
26	Camera GC 1600c	BSL III Lab	StarPak	Prosilica	20P200004	Aug-09	2,322	02-2151A-06122	GC1600C	BSL III	BSL III Lab		
27	Camera/Digital Video Recorder	BSL III Lab	Varied	Security North American Video	100111	May-05	7,840.00	412KVPAA032064	DX8000	BSL III Lab	2		
28	Caravan, Dodge 2000	Varied	Varied	Dodge	20P100147	Mar-05	9,000.00	1B4GP44G7YB780133	Grand SE/Sport	Varied	NA		
29	Card reader panel	BSL III Lab	Varied	Johnson Control	No Tag	May-05	2,254.55	NA	NA	BSL III Lab	2	46871-OP	
30	Cart for Loading Vans	Not Applicable	Not Applicable	Salesmaker	9423	Jun-94	1,195.00	None	289	Under stairs			
31	Centrifuge Mini	BSL III Lab	PCR	Fisher	No Tag	Aug-08	360.00	70627663		BSL III Lab	25	168700 OP	
32	Centrifuge Swinging Bucket Rotor	BSL III Lab	Varied	IEC/Thermo Electron	20P100097	Jun-04	1,642.94	NA	8947	BSL III Lab	2	HL0400216	
33	Centrifuge, Multi RPI/IEC	BSL III Lab Bulk Chemical & Hazardous Waste Storage	Varied	IEC/Thermo Electron	20P100096	Jun-04	6,831.00	84660605	120	BSL III Lab	2	HL0400216	
34	Chemical Safety Building	Not Applicable	Not Applicable	Haz Stor	No Tag	Apr-00	5,471.50	13299	UK	3701 S. 14th	Outside	PO 159161	
35	Chiller, Isotemp II	VOC's	EPA 524	Fisher	2551E200021	Apr-15	2,701.14	12759501150415		Organics	4		
36	Constant Flow Air Sampler	Varied	Varied	Unknown	8025	Oct-91	811.50	Unknown	224-PCXR7K	East Basement Hallway			
37	Digital Multimeter (Voltmeter)	Organics	Organics	Simpson	2833	Jan-79	1,341	O41647	461	Organic	4	HL50263 / 02833	
38	Diskmate Extraction Station	SOC'S	EPA Method 525.2	VWR Scientific	2551E9404	Mar-85	2,177.65	None Available	JT7463-6	Organic	133		
39	Dry Bath	Bacti	Varied	Barnstead Thermolyne	No Tag	?	<1,000	82105118674	DB17615 PN 114-8400-02 PN 483- B600-01 Part # 483W001- 02	Bacti	38		
40	Easy Distillation System	Ammonia Distillation	EPA Method 350.1	Westco Scientific Instruments	20P100076	Feb-02	14,605.90	1082		Inorganics	35	10076	
41	EDL System II Power Supply	Metals	SM3111B Back-up	Perkin Elmer	20P10446	Mar-94	3,650.00	533783	System II	Metals	143 Not used		
42	EDL System II Power Supply	Metals	SM3111B	Perkin Elmer	No Tag	Probably before 1994	around 3,500	472734	System II	Metals	144 Not used		39
43	Empore Vacuum Manifold 47- 6 station	SOC'S	EPA Method 525.2	Varian	20P8851	Sep-94	2,600.00	123	NA	Organic	up stairs hall cupboard		
44	Empore Vacuum Manifold 47- 6 station	SOC'S	EPA Method 525.2	Varian	20P9416	Oct-94	2,600.00	114	NA	Organic	up stairs hall cupboard		
45	Empore Vacuum Manifold 47- 6 station	SOC'S	EPA Method 525.2	Empore	No Tag	Jun-04	2,346.22	NA	NA	Organic	133	HL0300207	40
46	Empore Vacuum Manifold 47- 6 station	SOC'S	EPA Method 525.2	Empore	No Tag	Jun-07	2,346.22	NA	NA	Organic	133	HL0300207	41
47	Fax Machine	Varied	Varied	Samsung	No Tag	Sep-14	370.00	Z65MB8KFB0034	SF-760P	Varied	Hall by mail boxes		
48	FIAS 400	Mercury	SM3112B	Perkin-Elmer	No Tag	May-99	12,900.00	5269	400	Metals	143	PO 155943	9
49	FIAS 400 AS-90 autosampler	Mercury	SM3112B	Perkin-Elmer	No Tag	May-99	4,900.00	3742	AS-90	Metals	143	PO 155943	10
50	Fireboy Plus	BSL III Lab	Varied	IBS(Integra BioScience)	No Tag	Jun-04	538.97	NG-2211AP1042	14900	BSL III Office	25	HSL0400211	

	A	B	C	D	E	F	G	H	I	J	K	L	M
51	Flask Scrubber Dishwasher	Inorganics	Varied	Labconco	20P100082	Nov-03	5,243.00	030706258P	UK	Varied	35	HHSS4074	
52	Flask Scrubber Dishwasher Upper Spindle Rack	Inorganics	Varied	Labconco	No Tag	Nov-03	1,045.00	None	UK	Varied	35	HHSS4074	
53	Flash Rack for Dishwasher	Dish room UP	varied	UK	20P9463	Jan-95	1,662.00	None	None	Varied		Dish room	
54	Flash Rack for Dishwasher	Dish room UP	varied	UK	20P9464	Jan-95	1,662.00	None	None	Varied		Dish room	
55	Flash Rack for Dishwasher	Dish room UP	varied	UK	20P9465	Jan-95	1,662.00	None	None	Varied		Dish room	
56	Fluorescence Microscope	Not Used at this time	Not Used at this time	Leitz	20P9099	Aug-81	8,979.00	None	Alux 20	Not in use		Lab storage	
57	Freezer #0	Organics	Organics	True Brand	9400	Mar-95	1,165.00	1114110	T-12F	Organic	28		
58	Freezer, -70 Ultra Low Alarm System	BSL III Lab	Varied	Revco	Included in Freezer-70 Ultra Low system	Jun-04	Included in Freezer -70 Ultra Low system	NA	NA	BSL III Lab	2	HSL0400184	
59	Freezer, -70 Ultra Low CO2 Backup Sytem	BSL III Lab	Varied	Revco	Included in Freezer-70 Ultra Low system	Jun-04	Included in Freezer -70 Ultra Low system	NA	NA	BSL III Lab	2	HL0400184	
60	Freezer, -70 Ultra Low System	BSL III Lab	Varied	Revco	No Tag	Jun-04	13,149.44	TO90209463	Ultima II ULT12186-9-A36	BSL III Lab	2	HL0400184	11
61	Freezer, undercounter #1	VOC's	EPA 524.2	VWR	No Tag	Dec-02	825.00	X04L55032XL	U200SGA14	Organics	28	HL100463	
62	Fume Hood #7	Inorganics	TKN Prep	Labconco	20P10438	Jan-93	5,306.00	UK	UK	Inorganics	34	HL70001	
63	Fume Hood 4 ft w/2 Service Fix #3	Organics	Varied	Labconco	No Tag	Jun-01	3,153.04	1061520	UK	Organics	29	HL0100201	12
64	Fume Hood 6 ft	Organics	Varied	Labconco	20P100128	May-05	3,840.00	050130948H	UK	Organic	29	HL0100035	
65	Fume Hood 6 ft	Organics	Varied	Labconco	20P1000127	May-05	3,840.00	050130947H	UK	Organic Extraction	26	HL0100035	
66	Fume Hood 8 foot epoxy worksurface #8	Inorganics	COD/Acid Baths	Labconco	No Tag	Jan-01	1128.00	oo1261736	None	Inorganics	35	HL100034	
67	Fume Hood 8 ft & 2 Base cabinets #1	Metals	Varied	Labconco	2551E9685	Sep-94	7,849.53	HL40317	UK	Metals	140		
68	Fume Hood 8 ft & 2 Base cabinets #10	Organics	Varied	Labconco	20P9686	Sep-94	7,849.53	UK	UK	Organics	133		
69	Fume Hood 8 ft & 2 Base cabinets #5	Organics	Varied	Labconco	2551E9687	Sep-94	4,849.53	UK	UK	organics	31	HL40227 & HL40316	
70	Fume Hood 8 ft & 2 Base cabinets #9	Inorganics	TDS/Reagent Prep	Labconco	20P9449	Sep-94	7,849.53	UK	UK	Inorganics	35	SW Hood 09449	
71	Fume Hood Base LCN 96831-06 #7	Inorganic	TDS/ Reagent Prep	Labconco	20P10440	Jan-93	3,175.00	UK	UK	Inorganics	34		
72	Fume Hood flammable cabinet for 4 foot hood #3	Organics	Varied	Labconco	No Tag	Apr-01	1492.00	438624	None	Organics	29	HL100037	
73	Fume Hood with 2 Service Fixtures #8	Inorganics	Varied	Labconco	No Tag	Feb-01	6,303.21	1261736	None	Inorganics	35	HL0100036	14
74	Fume Hood Work surface base #2	Metals	Varied	Labconco	No Tag	Jan-01	1440.00	000639121C	None	AA Lab	143	HL100035	
75	Enclosure w/o Sensor (Metal Prep Hood) #2	Metals	SM3111B, SM3112B, EPA 200.8	Labconco	No Tag	Feb-01	4,873.08	010247675C	UK	AA Metals	143	HL0100033	15

	A	B	C	D	E	F	G	H	I	J	K	L	M
	Fume Hood, Ventilation Standard Protector 4 ft for Lachat #13	Nutrients	Varied	Labconco	No Tag	Feb-01	1,840.30	None Available	UK	Inorganics	36	HL0100037	13
76	Gas Chromatograph	Organics	EPA 552.2	Agilent /HP	10149	Sep-00	44,941.85	US000038285	6890	Organics	30	PO 159553	
77	Gas Chromatograph	Organics	EPA 515.3	Agilent/HP	No Tag	Jun-99	36,021.24	US000029208	6890	Organic	30	PO 15175	16
78	Gas Chromatograph	Organics	EPA 504.1 EPA 505	Agilent/HP	No Tag	Jun-99	36,021.24	US000029176	6890	Organic	30	PO 15175	17
79	Gas Chromatograph with Headspace Autosampler	Blood Alcohol	Title 179	Agilent	20P200008 20P200009	Feb-14	62,987.40	USHZ799622 CN14030023	7890B 7697a	Alcohol	24	507937 OP	
80	Gas Chromatograph with Headspace Autosampler	Blood Alcohol	Title 179	Agilent/HP	No Tag	Jun-99	35,616.02	US00029192 - GC IT900303602 - HS	6890 7694	Alcohol	24	PO 15175	18
81	GC Headspace Autosampler	Blood Alcohol	Title 179	Agilent	No Tag	May-16	27,850.69	CN16220014	7697A (G4556A)	Alcohols	24	669327 OP	
82	Gas Leak Detector	Organics	Organics	Supelco	10441	Jan-93	980.09	None	21-250	Organics	29		
83	GC/MS, Polaris Q	SOC'S	EPA Method 525.2	Thermo-Finnigan	100071	Feb-02	70,620.00	MS - 110146 GC - TR102024 AS300 - 42012277	Polaris Q	Inorganics	30	58117-OP	
84	GC/MS Thermo Electron MS	VOC's computer included in MS System	EPA Method 524.2	Thermo Electron	20P100139 TAG 100151	Jan-06	76,680.00	100404 for MS 20062954 for GC	Thermo Trace DSQ II	Organic	4	69252-OP	
85	GC/MS, Thermo Electron, Computer	VOC's GC included in MS System	EPA Method 524.2	Thermo Electron	Included in 100139	Jan-06	Included in tag 100139	8C49P81	Dell	Organic	4	69252-OP	
86	GC/MS, Thermo Electron, GC		EPA Method 524.2	Thermo Electron	Included in 100139	Jan-06	Included in tag 100139	20062954	Trace Ultra GC	Organic	4	69252-OP	
87	GC/MS, Agilent	SVOC's	EPA 825	Agilent	MS-2551E200023 GC-2551E200022 AS-2551E200024	Mar-15	92,702.91	MS - US1614L410 GC - CN15133183 AS - CN15070020	MS - 5977A MS - 5977A GC - 7890B AS - 7650	Organics	30	584243 OP	
88	GC/MS, Agilent	VOC'S	EPA 824	Agilent	No Tag	Mar-15	111,272.79	MS - US1612L430 GC - CN15093121 AS - US15064007 Stratum-US15050004	MS - 5977A GC - 7890B Aquatek100 Stratum PTC	Organics	4	584511 OP	
89	Gem Series HPGE Detector GEM-20180	Organics	Rad Chem	Ortec	No Tag	Dec-94	20,000	22-P947A	20180	Organic	33		19
90	Gem Series HPGE Detector GEM-23185-P	Organics	Rad Chem	Ortec	No Tag	May-92	15,000	TP20478A	23185P	Organic	33		20
91	Hood, Biological Safety	BSL III Lab	Varied	LabConco	No Tag	Jun-04	10,772.12	040722955AG	Delta Series 3621236213 Type A2	BSL III Lab	2	HL0400200	21
92	Ice maker	Metals	Varied	Manitowoc	20P100144	Dec-05	3,095.70	110117214	QF0406	Metals Upstairs	143	75856-OP	
93	ICP MS	Metals	EPA Method 200.8	Perkin-Elmer	No Tag	Mar-99	137,720.00	o289903	Elan 6100	Metals	142	PO 156232	22
94	ICP/MS w/FastPREP SC4 DX	MET/MINR	EPA 200.8	Thermo-Scientific	20P200016 20P200017	May-14	164,771.00	SU03029R ICAP Qa X4SZ-100518 SC4 DX	ICAP QA	Metals	142	532323 OP	
95	Incubator, CO2 Stackable	BSL III Lab	Varied	VWR	No Tag	Jun-04	6,916.88	#1 2375T #2 2376B	7029604	BSL III Lab	2	HL0400199	23
96	Incubator, CO2 Stackable	BSL III Lab	Varied	VWR	No Tag	Jun-04	6,916.88	#3 2376T #4 2376B	7029604	BSL III Lab	2	HL0400199	24
97	Incubator, Thelco #1	Coliform Bacteria	Varied	Precision	20P100089	May-04	2,077.43	604051240	SDM	Bacti	38	HL_400133	

	A	B	C	D	E	F	G	H	I	J	K	L	M
99	Incubator, Thermo #2	Coliform Bacteria	Varied	Precision	20P100087	May-04	2,077.43	604051238	5DM	Bacti	38	HL400133	
100	Incubator, Thermo #3	Coliform Bacteria	Varied	Precision	20P100088	May-04	2,077.43	604051239	5DM	Bacti	38	HL400133	
101	Incubator, Thermo #4 Inspector 2000DSP Gamma Spec System with Germanium Detector	Coliform Bacteria	Varied	Precision	20P100086	May-04	2,077.43	604051237	5DM	Bacti	38	HL400133	
102	Lachat Autosampler	Organics	Rad Chem		No Tag, May be on Rad Program	From Rad Program DHHS	?	CITS 97-3060	GC2018, 79355L-7, 2002 CSL, 10017450	Organic	29	DOH10427	25 Page 94
103	Lachat Autosampler	Nutrients	Varied	Hach/Zellweger	20P100179	Jun-05	6,553.00	090659A520	ASX-520	Inorganics	34	115845ZO	
104	Jeep Grand Cherokee 2008	Lab wide pipet calibration	NA	Jeep	2551E20094	Sep-15		1J8HR48N78 C215572	Grand Cherokee	Lab	NA		
105	Lachat 8500 FIAS w/ASX520 Autosampler	Nutrients	TKN/TPOX/NO3	Hach	20P200010 20P200012	Dec-14	50,000.00	140100001636 140100002236	8500	Inorganics	34	50768 OP	
106	Lachat 8500 FIAS w/ASX520 Autosampler	Nutrients	NH3/NO2/OPO4	Hach	20P200011 20P200013	Dec-14	50,000.00	140100001637 140100002249	8500	Inorganics	36	50768 OP	
107	Lachat 8500 FIAS w/ASX Autosampler	Nutrients	EPA 353.2 & 385.1	Hach/Zellweger	20P100116	Oct-04	40,179.00	4090000036 Cetac1104212ASX	8500 ASX-510	Inorganics	36	21276OH	
108	LC System & accessories	Organics	EPA 845.2	Agilent/HP	20P100021	Apr-01	70,356.00	DE11112984	1100-FLD-2	Organics	31	PO 160264	
109	LC System & accessories	Organics	EPA 531.1 EPA 547	Agilent/HP	20P100079	Feb-00	47,957.79	DE91608509	1100-DAD-1	Organics	31	PO 158298	
110	Lift, Mechanical	Inorganic	Varied	RDO Material Handling	No Tag	Sep-00	1,675.00	52872-537502	PEL-88	Inorganic	35	HL0000310	27
111	LightCycler 4.5 w/ labtop & HP printer	BSL III Lab	Varied	Roche	20P200003	Apr-08	31,975.00	1408933	1.5	BSL	25	20191220	
112	LightCycler Carousel Centrifuge	BSL III Lab	Varied	Roche	20P200002	Jun-07	4,750.00	40684882	2	BSL	25		
113	Liquid Scintillation System	Radon in Water	SM7500-RN	Packard	20P10454	May-96	52,210.00	403751	B 2555	Organic	33		
114	LN2 Dewer	Radchem	Varied	Camberra	No Tag	Jun-03	1,200.00	D-50	D-50	Rad Chem	33	HL500211	
115	Magisert Inserting System	Customer service	Varied	Clartus	20P100113	May-05	7,362.00	05D0-6551	M300	Customer Service Organics	9	46124-OP	
116	Mercury Analyzer w/ ASX 400 autosampler & pump	Metals	EPA 245.2	Cetac Technologies	20P100148	Oct-05	16,200.00	080501Q1T6	Quick Trace M6100	Metals	143	63048 ZO	
117	Microscope Fluorescent 100 X Lens	BSL III Lab	Varied	Nikon/Boycce Scientific	No Tag	Jun-04	1,712.75	NA	Eclipse 80i	BSL III Lab	2	HL0400215	28
118	Manifold, Lachat 8500, for Fluoride	Nutrients	SM 4500F-C	Hach	20P200018	Feb-15	4,072.00	NA	NA	Inorganics	36	Master Lease 2013B 4.1	
119	Manifold, Lachat 8500, for Ammonia	Nutrients	EPA 350.1	Hach	20P200019	Feb-15	2,939.00	NA	NA	Inorganics	36	Master Lease 2013B 4.1	
120	Microscope Power source	BSL III Lab	Varied	Nikon/Boycce Scientific	No Tag	Jun-04	1,455.20	10150315	M100	BSL III Lab	2	HSL0400215	28
121	Microscope, Eclipse 80i and related parts	BSL III Lab		Nikon/Boycce Scientific	No Tag	Jun-04	Total partd cost 16,874.80	See parts below	See parts below	BSL III Lab	2	HSL0400214 & HSL0400215	28
122	Microscope, EPI Fluorescent attachment	BSL III Lab	Varied	Nikon/Boycce Scientific	No Tag	Jun-04	2,087.60	NA	Eclipse 80i	BSL III Lab	2	HL0400215	28

Current Equipment List June 2016

	A	B	C	D	E	F	G	H	I	J	K	L	M
123	Microscope, Nikon Labophot III Model	Not Used at this time	Not Used at this time	Nikon	20P8946	Nov-93	3,521.70	UK	UK	Not in use	Lab storage		
124	Microscope, Polarizing	Not Used at this time	Not Used at this time	Olympus	20P5897	Apr-87	6525.00	UK	UK	Not in use	Lab storage		
125	Microscope, Substage and stand	BSL III Lab	Varied	Nikon/Boycce Scientific	No Tag	Jun-04	3,356.65	400405	Eclipse 80i	BSL III Lab	2	HL0400214	28
126	Microscopic Stereoscope	Not Used at this time	Not Used at this time	Fisher	5077	May-81	906	UK	UK	Not in use	Lab storage	HL40136	
127	Microtiter Plate Reader & Software	BSL III Lab	Varied	Coulter Beckman	No Tag	Jun-04	7,752.00	253501136	AD340C	BSL III Lab	2	HL0400187	29
128	Microtiter Plate Washer	BSL III Lab	Varied	Coulter Beckman	No Tag	Jun-04	3,435.70	241501017	MW96/384	BSL III Lab	2	HL0400186	30
129	Microwave Digester, CEM	Metals	EPA 3015	CEM	20P100068	Sep-03	19,560.00	DS9628	Mars5	Metals	143		
130	Microwave Vessel Starter Kit	Metals	EPA 3015	CEM	20P100069	Sep-03	3,450.00	HP500	Mars5	Metals	143		
131	Microwave Vessel Starter Kit	Metals	EPA 3015	CEM	20P100070	Sep-03	3,450.00	HP500	Mars5	Metals	143		
132	Millipore Elix Water System w/ 60 L Reservoir	Varied	Varied	Millipore	20P100073	Nov-03	4,266.00	F3MN960551	UK	Varied	35		
133	Millipore Direct-Q3 UV	Metals	Varied	Millipore	20P20014	Mar-14	4,625.00	F4BA26279D	Direct-Q3	Metals	144	522559 OP	
134	Millipore Elix Water System w/ 60 L Reservoir & RO	Varied	Varied	Millipore purchased through Fisher	20P100122	Jan-05	5,304.05 Elix, 871.73 for reservoir & 469.51 for RO	F4SN99727C	Elix 10	Varied	upstairs dishroom	HL500023	
135	Millipore Mill-Q Academic Water System	Varied	Varied	Millipore	20P100072	Nov-03	2,641.00	F3KN31016A	UK	Varied	35		
136	MiniRadac Radiation Monitor	General	Varied	Canberra	No Tag	Oct-05	590.00	O7050295	MRAD213	Rad Chem	33	HL500308	
137	Oven, Blue M	Organics	Varied	Scientific Products	1255	Jan-81	195.00	UK	OVI-3551	Organic	29		
138	Oven, Precision Thelco #2	Inorganic	SSC	Precision Thelco	No Tag	?	less than 1,500.00	602031566	?	Inorganic	36	HSL0200168	
139	Oven, Precision Thelco #7	Inorganics	TSS	VWR Scientific	No Tag	Jul-04	1,260.30	604071157	51221147	Inorganic	34	HL0400288	
140	Oven, Thermo Electron	Inorganics	Drying glassware	Thermo Electron	No Tag	Jul-07	785.00	602873	6530	Inprganic	34		
141	Oven, Thermolyne Muffie #3	Organics	Varied	Thermolyne	20P8808	Aug-94	2,374.05	711940674736	F6020C-70	Organic	26	HL40311	
142	Oven, Thermolyne Type 6000 Ash Furnance #4	Organics	Varied	Baxter Healthcare	20P7323	Feb-90	2,365.00	53900554	F6038C	Organic	26	HL30228	
143	Oven, VWR #5	Organics	Varied	VWR Scientific	9813	Aug-94	411.30	300494	1305U	Organic	26	HL400312 PO143805	
144	Oven, VWR #5	Inorganic	Drying glassware	VWR Scientific	9814	Aug-94	411.30	O302594	1305U	Inorganic	35	HL700038 PO 143805	
145	Packard Y2K Upgrade	Radon in Water	SM7500-RN	Packard Instrument	No Tag	Apr-01	20,843.00	403751	Tri Carb 3100 TR	Organics	33	PO 160418	31
146	pH meter	BSL III Lab	Varied	Thermo Orion	No Tag	Jun-04	577.00	17466	250A3	BSL III Lab	2	HSL0400212	

	A	B	C	D	E	F	G	H	I	J	K	L	M
147	pH meter, Orion	Inorganics	Varied	Orion	No Tag	Jan-01	741.56	9418	330	Inorganics	36	HL100014	
148	pH meter, Orion	Inorganic	pH	Orion	No Tag Free	Jan-06	<1000.00	004008	370	Inorganics	36		
149	Pipet Calibration Software System	Lab wide pipet calibration	Pipette Calibration	Mettler Toledo	No tag	Nov-01	1127.78	None	None	Lab	organics	HL100434	
150	Portable Pressure Tank, 5-Gallon	Organics	EPA 549.1	Pope Scientific	9379	Dec-95	1,440.00	None	None	Organics	30		
151	Post column derivatization	Organics	EPA 547 EPA 531.1	Pickering	Included in 100021	Mar-06	18,000.00	1005300 Carbamate 3471 Gypposate	PCX	Organics	30	HHSS 6318, 23826-OR, 1345-OF	
152	Pump, Varsitic Power Dispenser #1	Bacti	Varied	Manostat	No Tag	?	less than 1,500.00	?	72-640-000	Bacti	38		
153	Pump, Varsitic Power Dispenser #2	Bacti	Varied	Manostat	No Tag	?	less than 1,500.00	?	72-640-000	Bacti	38		
154	Quantitray Sealer	Coliform Bacteria	9223B	Idexx	No Tag	Replacement 10/22/14	1000.00	04700-06-129		Bacti	38	HL03003617	
155	Quantitray Sealer PLUS	Bacti	9223B	Idexx	2551E200025	Dec-15	3350.00	QTP 13154900390 Traded in S/N 03459-04-075	WQTSPLUS	Bacti	38	63986SOP	
156	Quebec Colony Counter	Bacti	Bacti	Leica	No Tag	?	less than 1,500.00	?	3325	Bacti	38		
157	Rapid Solvent Evaporation system	SOC'S	525.2	Labconco	20P100090	Sep-04	7,031.42	42926600	NA	Organic	133		
158	Refrigerator	Bacteriology	Varied	True Brand	9392	Mar-95	1,263.00	1273584	T-23	Bacti	38		
159	Refrigerator	Varied	Varied	Whirlpool	No tag	Dec-07	389.99	V5U2473660	ET4WSKX5000	Varied	Upper Hallway		
160	Refrigerator	BSL III Lab	Varied	VWR	20P100085	Jun-04	2,671.29	1-3693635	T-23	BSL III Lab	2	HL0400188	
161	Refrigerator # 7	Alcohol	Alcohol	True Brand	9394	Mar-95	1,263.00	1273600	T-23	Alcohol	24		
162	Refrigerator #12	Inorganics	Varied	True Brand	20P100091	Mar-04	2,156.25	13660843	T-23	Inorganics	34	HL040090	
163	Refrigerator #2	Organics	Varied	True Brand	9393	Mar-95	1,263.00	1273588	T-23	Organic	29		
164	Refrigerator #3	Organics	Varied	True Brand	9395	Mar-95	1,263.00	1273603	T-23	Organic	29		
165	Refrigerator #5	Alcohol	Varied	Magic Chef	No Tag	Jun-05	549.00	16640026ZH	CF81722ARW	alcohol	24		
166	Refrigerator #8	Alcohol	Sample s	White Westinghouse	8346	Apr-01	399.99	LA-21710830	RT216PCWO	Alcohol	Upper Hallway		
167	Refrigerator #9	Air PM 2.5 & Air PM 10	Air PM 2.5 & Air PM 10	True Brand	9391	Mar-95	1,263.00	1273566	T-23	Air	26		
168	Refrigerator#20	Inorganics	Varied	True Brand	9396	Mar-95	1,263.00	1273730	T-23	Inorganics	34	HL50347	
169	Refrigerator, Double Wide	Blood Alcohol Sample Storage	Not Applicable	True Brand	No Tag	Nov-00	3531.20	2830825	T-49	Alcohol storage	24	HL0000392	32
170	Refrigerator, Double Wide, 49 cu ft #6	Blood Alcohol Sample Storage	Not Applicable	True Brand	20P100112	Nov-00	3,531.20	2830825	T-49	#6 Alcohol storage	24	HL0000392	
171	Refrigerator, Whirlpool	Break room	Not Applicable	Schafer's	No Tag	Nov-00	907.00	SK4149228	ED35JEXHW01	Break Room	37	HL_0000336	

	A	B	C	D	E	F	G	H	I	J	K	L	M
172	SensIR FTIR Halogen light	BSL III Lab	Varied	SensIR Technologies- Smiths Detection	No Tag	Jun-04	Included in system	AE07419	U-LH100-3	BSL III Office	25	HHSS4303 15147 ZO	33
173	SensIR FTIR Halogen light	BSL III Lab	Varied	SensIR Technologies- Smiths Detection	No Tag	Jun-04	Included in system	AD15321	U-LH100-3	BSL III Office	25	HHSS4303 15147 ZO	33
174	SensIR FTIR Olympus B5	BSL III Lab	Varied	SensIR Technologies- Smiths Detection	No Tag	Jun-04	Included in system	3L17249	BX51TRF	BSL III Office	25	HHSS4303 15147 ZO	33
175	SensIR FTIR Computer 7 printer	BSL III Lab	Varied	SensIR Technologies- Smiths Detection	For FTIR SYSTEM 26-0050590	Jun-04	Included in system	5ZSH551	6540	BSL III Office	25	HHSS4303 15147 ZO	33
176	SensIR FTIR IlluminatIR	BSL III Lab	Varied	SensIR Technologies- Smiths Detection	No Tag	Jun-04	Included in system	021220904A	NA	BSL III Office	25	HHSS4303 15147 ZO	33
177	SensIR FTIR System	BSL III Lab	Varied	SensIR Technologies- Smiths Detection	No Tag	Jun-04	61,916.00	Package SN# 2122 See parts below	See parts below	BSL III Office	25	HHSS4303 15147 ZO	33
178	SensIR FTIR Translight Polarizer/ Analyzer	BSL III Lab	Varied	SensIR Technologies- Smiths Detection	No Tag	Jun-04	900.00	NA	NA	BSL III Office	25	HL0400201	33
179	Solvent Cabinet, 36 in	Organics	Varied	VWR Scientific	No Tag	May-01	1,167.57	OOO438624	NA	Organics	31		
180	Steam Bath, Boekel	Inorganic	TDS	Boekel	10424	Jul-88	822.18	UK	UK	Inorganics	35	HL70066	
181	Steam sterilizer (autoclave)	Bacteriology	Varied	Castle Sybron	2814	Jun-80	UK	UK	591563	Varied	upper level dish room		
182	Steam sterilizer (autoclave) upgrade	Bacteriology	Not Applicable	Castle Sybron	Added to 2814	Feb-01	20,852.00	UK	MP-116/ 3100	Varied	upper level dish room	PO 160077	
183	Stomacher Blender	BSL III Lab	Varied	Seward Brinkman	No Tag	Jun-04	4,031.13	41215	MCL400C	BSL III Lab	2	HL0400185	34
184	Syrena Portable Gamma Unit	Bio Terror	Gamma Detection	Canberra	20P100077	Jun-04	4,250.00	176	EM72971	Inside Building Back Dock Door	Dock	HL0400179	
185	Syrena Portable Gamma Unit	Bio Terror	Gamma Detection	Canberra	20P100078	Jun-04	4,250.00	175	EM72971	Inside Building Front Door	Office	HL0400179	
186	Turbidimeter	Metals	EPA Method 180.1	Hach	No Tag	Jan-01	2,820.75	010100005696	2100AN	Metal Prep	140	HL0100010	35
187	Turbidimeter, Portable	Metals	EPA Method 180.2	Hach	10198	Mar-88	1,005.00	98030001 173	2100P	Metal Prep	140		
188	UPS Voltage Regulator	BSL III Lab	Varied	Liebert Corp	20P100161	Aug-06	4383.00	0614400184BW572	GXT2-5000-RT208	BSL III Work for Organic	Instrument Room	112221-OP	
189	UPS Voltage Regulator	BSL III Lab	Varied	Liebert Corp	No Tag	Aug-06	1347.50	AF0710617000218	GXT2-5000-RT120	BSL III	25	112221-OP	
190	UPS Voltage Regulator	BSL III Lab	Varied	Liebert Corp	No Tag	Aug-06	1347.50	AF0710617000220	GXT2-5000-RT120	BSL III Lab	25	112221-OP	
191	UV/VIS Spectrophotometer	BSL III Lab	Varied	Hach	20P100160	Aug-06	8,711.07	1172898	DR5000	BSL III Lab	25	112649-OP	
192	UV/VIS Spectrophotometer	Not used	Varied	Hach	20P10197	Apr-88	5,365.00	U0001070	DR14000U	Inorganics cabinet	36	HL10197	
193	UV/VIS Spectrophotometer	Sulfate COD	EPA Method 375.4 EPA 410.4	Shimadzu	20P100014	Mar-01	14,935.00	A10833880762	UV2401	Inorganics	36	PO 160239 /10016	
194	Voltage Regulator	Organics	EPA 524	Liebert Corp	20P100135	Jan-06	4373.00	0528700052BW572	GXT2-5000RT208	Organic	4		
195	Voltage Regulator	Organics	EPA 524	Liebert Corp	20P100136	Jan-06	4373.00	0528700049BW572	GXT2-5000RT208	Organic	4		
196	Vortexer Digital Mini	BSL III Lab	Varied	Fisher	No Tag	Jun-04	270.85	135	128103	BSL III Lab	2	HL0400213	

	A	B	C	D	E	F	G	H	I	J	K	L	M
197	Water Bath	Coliform Bacteria	SM9223B	Precision	No Tag	?	?	9502-102	253	Bacti	Lab storage		36
198	Water Bath	Coliform Bacteria	SM3223B	Pecision	No Tag	?	?	9404-302	253	Bacti	38	H40222	37
199	Water Bath Concentric Ring	Inorganic	TDS	Fisher	20P200006	Sep-08	1,679.48	83206420		Inorganic	35	227268OP	
200	Water Heating Bath	BSL III Lab	Varied	Thermo Electron	No Tag	Jun-04	1,500.00	104086012	EX-35D1	BSL III Lab	2	HL0400212	38

Current Equipment List June 2016

Appendix N June 2016

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Current Equipment List June 2016

Appendix N June 2016

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Current Equipment List June 2016

Appendix N June 2016

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Appendix N June 2016

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80	This HS moved to 6890 GC
81	7694 HS, S/N IT90303602 retired May 2016.
82	Installed on new 7890 GC
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84	Trading in 2015
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Current Equipment List June 2016

Sample Container Type, Preservation, Holding Time, and Turnaround Time Chart

ANALYTE	METHOD	CONTAINER TYPE & VOLUME REQUIRED	PRESERVATION	HOLDING TIME	TURN AROUND TIME
13 Parameter includes: Alkalinity, Calcium, Chloride, Nitrate, Fluoride, Iron, Hardness, Manganese, Sodium, pH, Sulfate, Special Quantitray, Total Dissolved Solids	See individual tests	(1) IDEXX 120 ml bottle, one white plastic bottle with yellow sulfuric acid sticker, one white bottle with nitric acid sticker, one plastic bottle with no preservative, and one 500 ml bottle	15-30 mg Sodium Thiosulfate in IDEXX bottle, sulfuric acid in nitrate bottle, Nitric acid in hardness bottle, add HNO3 to pH < 2 on receipt of cubitainer at lab. Cool 4°	Varies per test method	14 days for final report
N-methyl carbamoyloximes and N-methylcarbamates Non-chlorinated	EPA 531.1	(2) 40 ml vials with red dots	1.2 ml Monochloroacetic acid, pH<2 Cool, 4 C	28 days	21 days
N-methyl carbamoyloximes and N-methylcarbamates Chlorinated	EPA 531.1	(2) 40 ml vials Both with green cots	5 mg liquid Sodium Thiosulfate Cool, 4 C	28 days	21 days
1,2-Dibromomethane and 1,2-Dibromo-3-Chloropropane	EPA 504.1	(2) 40 ml vials & one trip blank	3 mg Sodium Thiosulfate, Cool 4 C	14 days collection to extract, 24 hours extract to analysis	14 days
Alkalinity, as CaCO3	SM 2320B	(1) 125 ml plastic bottle or 1L cubitainer	Cool 4 C	14 days	7 days
Alpha-emitting Radium Isotopes	600/4-75-008	Quart or gallon Cubitainer	None	6 months	30 days
Aluminum	EPA 200.8	125 ml plastic bottle or 1L cubitainer	When received at lab HNO3, pH<2 added to container	6 months	21 days
Antimony	EPA 200.8	125 ml plastic bottle or 1L cubitainer	When received at lab HNO3, pH<2 added to container	6 months	21 days
Arsenic	EPA 200.8	125 ml plastic bottle or 1L cubitainer	When received at lab HNO3, pH<2 added to container	6 months	21 days
Asbestos	EPA 100.2	(2) 1L amber bottles	Cool 4C	48 hours to Contract Lab	Contract Lab
Barium	EPA 200.8	125 ml plastic bottle or 1L cubitainer	When received at lab HNO3, pH<2 added to container	6 months	21 days
Beryllium	EPA 200.8	125 ml or 1L plastic bottle	When received at lab HNO3, pH<2 added to container	6 months	21 days
Bicarbonate/Carbonate	SM2320B	500 ml plastic bottle	Cool 4C	14 days Contract Lab	21 days Contract Lab
Bismuth	EPA 200.8	500 ml plastic bottle	HNO3<2	6 months Contract Lab	21 days Contract Lab
Blood Alcohol	Title 177	(2) 10 ml vacutainers	Sodium Fluoride & Potassium Oxalate	14 days	5 days
BOD/CBOD	EPA 405.1 SM 5210.B	1L cubitainer	Cool 4C	48 hours	7 days
Boron	EPA 200.7	500 ml plastic bottle	HNO3<2	Contract Lab	14 days Contract Lab
Bromate	EPA 317.0 REV 2.0	125 plastic bottle	.12 ml of 5% EDA	28 days Contract lab	21 days Contract Lab
Cadmium	EPA 200.8	125 ml plastic bottle or 1L cubitainer	When received at lab HNO3, pH<2 added to container	6 months	21 days
Calcium FLAA	SM 3111B EPA 325.2	125 ml plastic bottle or 1 liter cubitainer	When received at lab HNO3, pH<2 added to container	6 months	14 days
Chloride	SM 4500-Cl-E	125 ml plastic bottle or 1L cubitainer	None	28 days	14 days

Sample Container Type, Preservation, Holding Time, and Turnaround Time Chart

ANALYTE	METHOD	CONTAINER TYPE & VOLUME REQUIRED	PRESERVATION	HOLDING TIME	TURN AROUND TIME
Chlorite	EPA 300.1	250 ml plastic bottle	Cool 4C, 1 ml EDA	14 days Contract Lab	21 days Contract Lab
Chlorinated Acids Non-chlorinated	EPA 515.3	(2) 60 ml amber vials	Cool 4 C	14 days to extract; 14 days from extract to analysis	20 days
Chlorinated Acids Chlorinated	EPA 515.3	(2) 60 ml amber vials	4.8 mg of Sodium Thiosulfate, Cool 4 C, Dark container	14 days to extract; 14 days from extract to analysis	20 days
Cobalt	EPA 200.8	125 ml plastic bottle or 1L cubitainer	When received at lab HNO ₃ , pH<2 added to container	6 months	21 days
Chromium	EPA 200.8	125 ml plastic bottle or 1L cubitainer	When received at lab HNO ₃ , pH<2 added to container	6 months	21 days
COD	EPA 410.4 / Hach 8000	125 ml plastic bottle	Cool 4 C, H ₂ SO ₄ <2	28 days	14 days
Colliert & Colliert Quantitray	SM 9223B	120 ml IDEXX bottle (Requires a minimum of 100 ml of sample)	15-30 mg Sodium Thiosulfate	30 hours	3 days
Conductivity	SM 2510B	125 ml plastic bottle or 1L cubitainer	Cool, 4 C	28 days	7 days
Copper	EPA 200.8	1L cubitainer	When received at lab HNO ₃ , pH<2 added to container	6 months	21 days
Cyanide, ISE	SM4500-CN-F	125 ml Nalgene bottle with white NaOH sticker	NaOH pH> 12, Cool, 4 C	14 days	14 days
Diaquat and Paraquat	EPA 549.2	500 ml PVC high density amber bottle	50 mg Sodium Thiosulfate, Cool, 4 C, Upon receipt at lab add 10% sulfuric acid to pH <2	7 days to extract; 21 days from extract to analysis	21 days
DIC (Dissolved inorganic carbon)	SW9060	500 ml amber glass bottle	Cool 4C	28 days Contract lab	14 days Contract Lab
Dioxin	EPA 1613	(2) 1L amber bottles	Cool, 4 C	30 days Contract Lab	Contract Lab
Dissolved Oxygen	SM4500-O-G	1L cubitainer	Cool, 4C	Contract Lab	Contract Lab
Endothall	EPA 548.1	(2) 1L amber bottles	Sodium Thiosulfate	7 days Contract Lab	Contract Lab
Fecal Coliform	SM 9223 B QT	120 ml or 250 ml sterile IDEXX bottle depending on # of dilutions required & tests requested	Chlorinated system Sodium Thiosulfate required Cool, < 4 C	30 hour Drinking Water, 24 hour for non-compliance, 6 hours for private & compliance	4 days
Fecal Strep	IIID.2**	120 ml or 250 ml sterile IDEXX bottle depending on # of dilutions required & tests requested	Chlorinated system Sodium Thiosulfate required Cool, < 4 C	6 hours	4 days
Filterable (TDS)	EPA 160.1 SM2540C EPA 340.2 /	500ml plastic cubitainer	Cool, 4 C	7 days	7 days
Fluoride	SM4500-F-C	120 ml Nalgene bottle	None	28 days	10 days
Glyphosate Non-Chlorinated	EPA 547	(2) 40 ml vials & 1 trip blank, Teflon lids	No preservative, Cool 4 C	14 days non-frozen; 18 months frozen	21 days
Glyphosate Chlorinated	EPA 547	(2) 40 ml vials & 1 trip blank, Teflon lids	4 mg Sodium Thiosulfate , Cool 4 C	14 days non-frozen; 18 months frozen	20 days
Gross Alpha	EPA 900.0	500ml plastic cubitainer	None	6 months Contract Lab	Contract Lab

Sample Container Type, Preservation, Holding Time, and Turnaround Time Chart

ANALYTE	METHOD	CONTAINER TYPE & VOLUME REQUIRED	PRESERVATION	HOLDING TIME	TURN AROUND TIME
Halobacetic Acids	EPA 552.2 EPA 130.2 / SM 2340C	(2) 60 ml amber vials with green stickers	6mg ammonium chloride, sent to chlorinated systems only, Cool, 4 C	14 days to extract; 14 days from extract to analysis if frozen, if not frozen 7 days	20 days
Hardness, Total, by Titrimetric		125 ml Nalgene bottle or 1L cubitainer	HNO ₃ , pH<2, Cool 4 C	6 months	7 days
Heterotrophic Plate Count	SM 9215B	120 ml IDEXX bottle with at least 100 ml of sample	Sodium Thiosulfate, Cool, 4 C	8 hr (max transit time 6 hours & 2 hour processing time) or 24hr max if sample kept at <4 C & > 0 C.	7 days
Iron Bacteria	IRB-BART	Idexx bacti bottle	Cool, 4C	24 hours	14 days
Iron, Drinking water	EPA 236.1 / SM 3111B EPA 236.1 /	125 ml plastic bottle or 1L cubitainer	When received at lab HNO ₃ , pH<2 added to container	6 months	21 days
Iron, Environmental	SM 3111B	125 ml plastic bottle or 1L cubitainer	HNO ₃ , pH<2	6 months	21 days
Langier Index	See individual tests	1L cubitainer and (1) plastic bottle with nitric acid sticker	HNO ₃ , pH<2 for Total Hardness bottle		
Lead	EPA 200.8	1L cubitainer	When received at lab HNO ₃ , pH<2 added to container	6 months	21 days
Magnesium FLAA	EPA 242.1 / SM 3111B	125 ml plastic bottle or 1L cubitainer	When received at lab HNO ₃ , pH<2 added to container	6 months	14 days
Manganese	EPA 200.8 EPA 245.2, EPA 245.5, SM 3112B	125 ml plastic bottle or 1L cubitainer	When received at lab HNO ₃ , pH<2 added to container	6 months	21 days
Mercury		1L cubitainer	When received at lab HNO ₃ , pH<2 added to container	28 days	21 days
Molybdenum	EPA 200.8	125 ml plastic bottle or 1L cubitainer	When received at lab HNO ₃ , pH<2 added to container	6 months	21 days
Nickel	EPA 200.8	125 ml plastic bottle or 1L cubitainer	When received at lab HNO ₃ , pH<2 added to container	6 months	21 days
Nitrogen - Kjeldahl	EPA 351.2	1L cubitainer	H ₂ SO ₄ , Cool, 4 C	28 days	14 days
Nitrogen - Nitrate/Nitrite	EPA 353.2	125 ml plastic bottle or 1L cubitainer, Sulfuric Acid Sticker	H ₂ SO ₄ , pH<2	28 days	7 days
Nitrogen-Ammonia Distilled	EPA 350.1	125 ml plastic bottle or 1L cubitainer	H ₂ SO ₄ , pH<2 Cool, 4 C	28 days	14 days
Nitrogen-Ammonia Non-Distilled	EPA 350.1	125 ml plastic bottle or 1L cubitainer	H ₂ SO ₄ , pH<2 Cool, 4 C	28 days	14 days
Nitrogen-Nitrite	EPA 353.2	125 ml plastic bottle or 1L cubitainer	Cool, 4 C	48 hours	7 days
Non-filterable (TSS)	EPA 160.2	1L cubitainer	Cool, 4 C	7 days ideally .25 hours, can hold 14 days	7 days 7 days Page 87
pH	EPA 150.1	125 ml or 1L plastic bottle	None		
Phase II IOC includes: Arsenic, Barium, Cadmium, Chromium, Fluoride, Mercury, Selenium	See individual tests	1L cubitainer and (1) white plastic bottle	When received at lab HNO ₃ , pH<2 added to the 1 liter cubitainer	6 months metals, 28 days Fluoride and Mercury	Total report 21 days

Sample Container Type, Preservation, Holding Time, and Turnaround Time Chart

ANALYTE	METHOD	CONTAINER TYPE & VOLUME REQUIRED	PRESERVATION	HOLDING TIME	TURN AROUND TIME
Phase V includes: Antimony, Beryllium, Cyanide, Nickel, Sulfate, Thallium	See individual tests	1L cubitainer, (1) white plastic bottle with NaOH sticker, (1) white plastic bottle no preservative	NaOH pH> 12 for Cyanide bottle, Cool, 4 C	See individual tests	21 days for final report
Phosphate - Ortho- as P	EPA 365.1	One 125 ml plastic bottle or one liter cubitainer	Filter immediately, Cool, 4 C	48 hours	7 days
Phosphorus - Total	EPA 365.4	One 125 ml plastic bottle or one liter cubitainer	Cool, 4 C, H2SO4 < 2	28 days	14 days
PoChlorinated Biphenyls & Toxaphene	EPA 505 EPA 258.1 / SM 3111B	Two 40 ml vials One 125 ml plastic bottle or one liter cubitainer	3 mg Sodium Thiosulfate, Cool, 4 C When received at lab HNO3, pH<2 added to container	14 days collection to extract, 24 hours extract to analysis	14 days
Potassium FLAA or FLAE	EPA 524.2	Two 40 ml vials & one trip blank all with HCL and blue sticker, a DO NOT OPEN sticker on blank	0.25 ml HCL in all vials, Cool 4 C	14 days preserved	10 days
Purgeable Organics Drinking Water Non-Chlorinated	EPA 524.2	Two 40 ml vials & one trip blank all with an ascorbic acid label and green sticker	All vials get 25 mg of Ascorbic acid (The blank gets 4 drops of 50% HCL), a blue aticker and a DO NOT OPEN sticker, Collector adds 4 drops of HCL to samples vials after collection, Cool 4 C	14 days preserved	10 days
Purgeable Organics Drinking Water Chlorinated	EPA 524.2	(3) 40 ml vials & (1) trip blank all with ascorbic acid label and green sticker	Ascorbic acid (25mg) (the blank gets 4 drops of 50% HCL), a blue sticker and a DO NOT OPEN sticker, Collector adds 4 drops of HCL to other vials after collection, Cool 4 C	14 days preserved	10 days
Radium-226	EPA 903.1	One half gallon cubitainer	None	6 months	6 weeks
Radium-228	EPA 904.0	One half gallon cubitainer	None	6 months	6 weeks
Radon, liquid scintillation	SM 7500-RN	(4) 40 ml glass vials with tetlon lined caps	None	3 days	5 days
Residual Chlorine	SM4500-CL-G	125 ml plastic bottle	None	6 hours	7 days
Salinity	SM2520B	250 ml plastic bottle	Cool, 4C	28 days Contract lab	Contract Lab
Selenium	EPA 200.8	125 ml plastic bottle or 1L cubitainer	When received at lab HNO3, pH<2 added to container	6 months	21 days 14 days Contract Lab
Silica	EPA 200.7	500 ml plastic bottle	HNO3<2	6 months Contract Lab	14 days Contract Lab
Silicon	EPA 200.7	500 ml plastic bottle	HNO3<2	6 months Contract Lab	Lab
Silver	EPA 200.8	125 ml plastic bottle or 1L cubitainer	When received at lab HNO3, pH<2 added to container	6 months	21 days
Sodium FLAA or FLAE	EPA 273.1 /3111B	125 ml plastic bottle or 1L cubitainer	When received at lab HNO3, pH<2 added to container	6 months	14 days
Sulfate Reducing Bacteria Sulfate Turbidometric	SRB-Bart EPA 375.4 / SM 4500-SO4-E	Idexx bacti bottle 125 ml plastic bottle or 1L cubitainer	Cool, 4C	24 hours	14 days Page 88
Sulfide	SM4500-S-F	500 ml plastic bottle	Cool, 4 C	28 days	14 days 14 days Contract Lab
Synthetic Organic Compounds, Drinking Water Non-Chlorinated	EPA 525.2	(2) 1L amber glass bottles	Cool 4C, Zinc acetate, NaOH>9 4 ml .50% HCL, Cool, 4 C	7 days to Contract Lab 14 days to extract, 30 days from extraction to analysis	14 days

Sample Container Type, Preservation, Holding Time, and Turnaround Time Chart

ANALYTE	METHOD	CONTAINER TYPE & VOLUME REQUIRED	PRESERVATION	HOLDING TIME	TURN AROUND TIME
Synthetic Organic Compounds, Drinking Water Chlorinated	EPA 525.2	(2) 1L amber glass bottles with green dots	50 mg Sodium Sulfite, Cool, 4 C, 4 ml of 50% HCL added when received at Lab	14 days to extract; 30 days from extraction to analysis	14 days
SSC (Suspended Sediment Concentration)	ASTM D3977-97	8 Oz clear glass container	None	14 days	21 days
Thallium	EPA 200.8	125 ml plastic bottle or 1L cubitainer	When received at lab HNO ₃ , pH<2 added to container	6 months	21 days
Total Organic Carbon	SM 5310B SW6010B	(2) 40ml glass vials	Phosphoric acid, Cool 4 C	28 days Contract lab	21 days Contract Lab
Total Sulfur	EPA 200.7	500 ml plastic bottle	HNO ₃ <2		14 days Contract Lab
Turbidity	EPA 180.1 SM 2130B	125 ml plastic bottle	None	48 hours	7 days
Uranium, Isotopic	HASL 300 U02	(1) quart or gallon cubitainer	None	6 months	4 weeks Contract Lab
Uranium, Mass	EPA 200.8	125 ml plastic bottle	When received at lab HNO ₃ , pH<2 added to container	6 months	21 days
Vanadium	EPA 200.8	125 ml plastic bottle	When received at lab HNO ₃ , pH<2 added to container	6 months	21 days
Zinc	EPA 200.8	125 ml plastic bottle or 1L cubitainer	When received at lab HNO ₃ , pH<2 added to container	6 months	21 days

APPENDIX P

NEBRASKA DEPARTMENT OF ENVIRONMENTAL QUALITY
ANALYTICAL REQUEST FORM

East Run

NDEQ Program: Surface Water	Project Name: Ambient Stream Network
Resource Tracking #: 03 026 5652	
Sample Collector:	Send Results To: John Lund

Trip Number: D E Q _____ 0 3 A **Visit No.** 1
 Sampler I.D. _____ Departure Date (mm/dd) (yy) & Trip # per Day (A, B etc.) _____ (1
 etc.)

Station Number/ QC ID Number	Location Description	Collection Date	Collection Time	Lab Number	Containers per Sample
SLP2ANTLP104	Antelope Cr – State Fair				4
SLP2LSALTC08	Little Salt Cr - Lincoln				4
SLP2SALTC180	Salt C-Greenwood				4
SLP2WAHOO107	Wahoo C-Ashland				4
SLP1PLATT150	PlatteR-Louisville				4
SMT1PAPIO165	Papillion Cr – Ft. Crook				4
SNE1WPNGW135	Weeping Water C - Union				4
SLP2SALTC301	Salt Cr – Pioneers Street				4

PARAMETER REQUEST

Contract Lab Parameters

Total Suspended Solids (00530)	Nitrate-Nitrite Nitrogen, as N. (00630)	Kjeldahl Nitrogen, Total (00625)
Ammonia, as N. (00610)	Phosphorus, as P., Total (00665)	Chloride, as Cl, (00940)

NDEQ Bio-Lab Parameters

Bayer Crop Science Lab

Atrazine; Alachlor; Metolachlor	Balance
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CONTAINER/PRESERVATION

<input checked="" type="checkbox"/> Un-Preserved Cubie	<input checked="" type="checkbox"/> Cubie/H ₂ S ₄	Cubie/HNO ₃	Sterilized Bacteria Bottle
Un-Pres. Glass W/ Teflon Lid (Qt.)	Pres. (H ₂ S ₄) Glass W/ Teflon Lid (Qt.)	<input checked="" type="checkbox"/> Unpres. Pest. Jar W/ Teflon Lid (140 ml)	40 ml Glass Vial W/Teflon Lid
Filtered/Un-Pres	Filtered/Pres. (H ₂ S ₄)	Filtered/Pres.(HNO ₃)	Un-Pres./No Air Space
<input checked="" type="checkbox"/> 140 ml Amber Plastic Bottle			

Note: Contract Lab = 2 Cubies; Bio-Lab = 1 glass bottle; Aventis Lab = 1 plastic bottle

CHAIN OF CUSTODY RECORD

Delivered By:	Received By:	Date:	Time:	Lab Numbers:

COMMENTS : _____

Standard Operating Procedures Table of Contents

Series	SOP #	Title	Method	Revision Date	Last Review Date	Current Version Author
1000		GENERAL PROCEDURES				
	1100.1J	Training and Qualifications		06/18/13	10/07/15	Wieting
	1500.1H	Records Management		03/15/16		Koehler-Brown
	1600.1H	Preparation of Standard Operating Procedures (SOP's)		06/18/13	12/04/15	Wieting
	1800.1K	LIMS Login and Reporting		11/24/15	11/24/15	Fosler
	1900.1M	Customer Service Procedures		01/05/16		Koehler-Brown
	1910.1F	DEQ Customer Services		12/03/15		Koehler-Brown
	1920.1D	Data Entry into LIMS		06/18/13	12/04/15	Boden
2000		METALS				
	2100	Digestions Procedures				
	2170.1I	Microwave Assisted Acid Digestion	SM3030K, EPA 3015, EPA 3015A	06/02/16		Jackson
	2180.1A	Sample Filtration by Vacuum	EPA 200.8 REV 5.4 /SM3030B	08/02/16		Jackson
	2200	Minerals				
	2210.2J	Calcium, Total and Dissolved, FLAA DW & ENV	EPA 215.1/ SM3111B	03/04/11	08/04/16	Jackson
	2220.1K	Magnesium, Total and Dissolved, FLAA DW & ENV	EPA 242.1/ SM3111B	02/18/11	08/04/16	Jackson
	2230.1J	Potassium, Total and Dissolved, FLAA ENV & DW	EPA 258.1/ SM3111B	02/18/11	08/04/16	Jackson
	2240.1K	Sodium, Total and Dissolved, FLAA ENV & DW	EPA 273.1/ SM3111B	02/18/11	08/04/16	Jackson
	2300	Flame Analysis, FLAA				
	2330.2H 2330.1I	Iron environmental & Drinking Water (combined w/2330.2B)	EPA 236.1/ SM3111B	03/04/11	08/04/16	Jackson
	2400	Mercury				
	2400.3I	Mercury, FIAS & Cold Vapor AA & Digestion	EPA 245.1 Rev 3.0, 245.2, 245.5/ SM3112B	01/14/16		Groshans
	2800	ICP Metals				
	2800.2	Metals by ICP/MS including Turbidity for Metal Prep "iCAP Q"	EPA 200.8	05/31/16		Groshans
3000		ORGANICS				
	3100	Radiochemistry				
	3110.1D	Radon in Drinking Water, liquid scintillation	RN	09/16/10	07/29/16	Balk
	3200	Analysis of Blood Alcohol				
	3230.1F	Data review and Handling	Title 177	07/28/16		Wieting
	3240.1G	Body Fluid Alcohol Analysis (HP)	Title 177	12/29/11	07/29/15	Langan
	3260.1C	HP Maintenance	Title 177	12/29/11	07/29/15	Langan

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Series	SOP #	Title	Method	Revision Date	Last Review Date	Current Version Author
	3300	Analysis by HPLC				
	3310.1G	N-Methyl Carbamoyloximes and N-Methylcarbamates	EPA 531.1	01/10/13	07/29/16	Balk
	3320.1F	Glyphosate	EPA 547	01/10/13	07/29/16	Balk
	3330.2D	Diquat and Paraquat	EPA 549.2	02/18/11	07/29/16	Balk
	3600	Analysis by GC				
	3610.2H	Chlorinated Acids by ECD	EPA 515.3 Rev 1.0	01/31/14	07/27/16	Boden
	3620.1J	EDB, DBCP, and 1,2,3-TCP	EPA 504.1 Rev 1.1	03/10/14	07/27/16	Jones
	3630.1J	Polychlorinated Biphenyls (PCB's) and Toxaphene	EPA 505 Rev 2.1	12/21/15		Boden
	3650.1J	Haloacetic Acids by ECD	EPA 552.2 Rev 1.0	01/31/14	07/27/16	Boden
	3700	Analysis by GC/MS				
	3710.1J	Purgeable Organics, Drinking Water	EPA 524.2 Rev 4.1	05/10/16		Senanayake
	3730.1J	Synthetic Organic Compounds, Drinking Water	EPA 525.2 Rev 2.0	08/11/16		Jones
	3800	AGGREGATE ORGANIC CONSTITUENTS				
	3800.1F	Chemical Oxygen Demand	EPA 410.4/ Hach8000	01/22/14	07/27/16	Holthus
	3900.1H	Biochemical Oxygen Demand	EPA 405.1	03/31/16		Wulfekoetter
4000		INORGANIC, NON-METALLICS				
	4100.2F	Fluoride by QuikChem 8500	SM4500F-C Lachat # 10-109-12-2-A	07/23/14	07/27/16	Yates
	4110.2K	Ammonia as N by QuikChem 8500	EPA 350.1 Lachat # 10-107-06-1-C EPA 353.2	06/08/15	06/29/16	Yates
	4120.2H	Nitrate/Nitrite as N by QuikChem 8500	Lachat # 10-107-04-1-A EPA 351.2	07/22/14	07/27/16	Mai
	4130.2K	Total Kjeldahl Nitrogen by QuikChem 8500	Lachat # 10-107-06-2-D EPA 365.1	08/25/14	07/27/16	Mai
	4140.2I	Orthophosphate by QuikChem 8500	Lachat # 10-115-01-1-A EPA 365.4	08/05/14	07/27/16	Yates
	4150.2M	Total Phosphorus by QuickChem 8500	Lachat # 10-115-01-1-C EPA 375.4/	08/25/14	07/27/16	Mai
	4160.3K	Sulfate by Turbidimetric Method	SM4500SO4-E EPA 325.2/ SM4500-CL-E	03/25/16		Wulfekoetter
	4170.2H	Chloride by QuikChem 8500	Lachat # 10-117-07-1-B	09/10/10	07/27/16	Pomajzl
	4180.3L	Cyanide by Ion Selective Electrode	SM4500-CN-F	04/22/16		Wulfekoetter
	4190.1J	Alkalinity, Manual Titration	SM2320B	02/21/14	07/27/16	Holthus
	4210.2I	Nitrite by QuikChem 8500	Lachat # 10-107-05-1-A	07/22/14	07/28/16	Mai
	4230.1D	Total Residual Chlorine	SM4500-CL-G	02/08/11	07/27/16	Holthus

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Series	SOP #	Title	Method	Revision Date	Last Review Date	Current Version Author
6000		PHYSICAL/ PROPERTIES/ MICROBIOLOGICAL				
	6100.1H	pH, Aqueous/Soil, Manual Electrode	SM4500-H-B	01/22/14	07/27/16	Holthus
	6210.1G	Total Suspended Solids	EPA 160.2	10/26/10	07/27/16	Holthus
	6220.1G	Total Dissolved Solids	SM2540C	10/27/10	07/27/16	Holthus
	6230.1C	Suspended Sediment	ASIM D3977-97 (2002)	10/26/10	07/27/16	Holthus
	6300.2I	Conductivity, Manual Cell	EPA 120.1/ SM2510B	10/08/10	07/27/16	Holthus
	6410.2C	Fecal Coliform by Colilert Quantitray	SM9223B	04/04/16		Wulfekoetter
	6440.1Q	Colilert	SM9223B	03/16/16		Wulfekoetter
	6450.1J	Heterotrophic Plate Count/ Simplate Method	SM9215E	03/25/16		Wulfekoetter
	6460.1B	Bart Test for Sulfur Related Bacteria	Hach	01/24/14	01/28/16	Wulfekoetter
	6470.1B	Bart Test for Irons Related Bacteria	Hach	01/24/14	01/28/16	Wulfekoetter
	6500.1H	Hardness, Total by EDTA Titration	EPA 130.2/ SM2340C EPA 180.1 SM	01/22/14	07/27/16	Holthus
	6600.2I	Turbidity	2130B	10/28/10	07/27/16	Holthus
7000		SAFETY/GOOD LABORATORY PRACTICES/ DISPOSAL				
	7300.1E	Management of Lab Waste		07/25/14	12/11/15	Boden/Wieting
	7400.1E	Sample Disposal		06/18/13	12/10/15	Boden/Wieting
	7500.1E	Contingency Plan for Emergencies Involving Hazardous Materials		08/14/14	12/11/15	Boden/Wieting
	7600.1 K	CHP (See Separate Notebook)		10/07/15		Irons
	7700.1B	Incident Response Manual		04/11/16		Koehler-Brown
8000		QUALITY ASSURANCE/ QUALITY CONTROL				
	8100.1H	Ancillary Equipment Documentation		06/17/13	10/07/15	Wieting
	8200.1H	Documenting Data Quality		06/19/13	10/07/15	Wieting
	8320.1I	Data Review/ Reporting Results		06/18/13	10/07/15	Wieting
	8400.1H	Audits and On-site Evaluations		06/18/13	10/07/15	Wieting
	8500.1G	Corrective Action Documentation and Procedures		06/19/13	10/07/15	Wieting
9000		AIR				
	9200.1G	PM2.5 Air Quality		07/01/14	07/29/16	Jackson
SM: Standard Methods for the Examination of Water and Waste Water, 20th Edition, 1998						
SM: Standard Methods for the Examination of Water and Waste Water, 21st Edition, 2005						
SM: Standard Methods for the Examination of Water and Waste Water, 22nd Edition, 2012						
100-600 Series: Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020. Revised 3/1983						
CFR Part 136, Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water						

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Series	SOP #	Title	Method	Revision Date	Last Review Date	Current Version	Author
Act, Tables IA,IB, IC, ID, and IE, as published in the Fedral Register, Vol 65, No. 165, pp. 50758-50770, October 1991.							
SW: 1000-8000 Series: Test Methods for Evaluatong Solid Wastes, Physical/Chemical Methods, (SW-846) Third Edition, 1986, as ammended by Update I (July 1992), Update II (September 1994), Update IIA (August 1993), and Update IIB (February 1995)							

ANCILLARY EQUIPMENT TABLE

Equipment	Frequency of Check or Calibration	Acceptable Ranges	Re-certification Frequency	Checked by Whom	Records maintained in
Ovens, Incubators	Daily when in use	As specified in individual methods		Analyst using the equipment	Each section, in logbook
Refrigerators, Freezers	Daily when in use, 1x/week when not in use	Refrigerator 4 °C +/- 2 °C Freezer -20°C to -5°C		Team leader or designated back-up	Each section, in logbook or on equipment. Historical yearly temperature charts are placed in the QA Office logbook at the end of each year.
Balances and Weights	Before daily use Preventative maintenance annually Non-reference weights are calibrated with reference weights semi annually for bacti /inorganic and annually for organic	Acceptance range for weights is 0.2% of known value	→ → → → → → → → → → → → → → → → → → Reference weights are recertified at least every 5 years by an outside source.	First analyst to use → → → → Outside service → → → → → Outside service or in lab analyst → → → → →	Each section in balance logbook QA Office QA Office
Pipettes	Quarterly	For accuracy, the average of 4 measurements must be within +/- 5% of the calibrated volume. For precision, the average of four measurements must be within +/- 2.5% of the calibrated volume.		Each section does their own	List, date, pass/fail status in Logbook –Kept with pipet calibration system in the organic section Cal. data kept with software & I drive
Thermometers	Annually against NIST thermometer.	The difference between the working thermometer and the certified thermometer must be within +/- 1°C. Incubator thermometers must be within +/- 0.5°C.	NIST thermometer re-calibrated at least once every five years by an outside source	NIST – outside service Working – each section does their own	QA Office in thermometer calibration logbook
Water stills	Conductivity Monthly PH Monthly Total Residual chlorine-Monthly Heterotrophic Plate Count-Monthly Metals- Yearly Bacti Quality-annually Fluoride & Nitrate annually	<2umhos/cm at 25 °C pH: 5.5-7.5 Total Residual chlorine <0.01 mg/L Heterotrophic Plate Count < 500 cfu/ml, Pb, Cd, Cr, Cu, Ni, Zn: no greater than 0.05 mg/L per contaminate, collectively, no greater than 0.1 mg/l Bacteriological Quality of Reagent water: Ratio of growth rate 0.8:3.0 Fluoride < 4 Nitrate < 10		Collected by primary analysts in Bacti, inorganic and inorganic test areas. Ran by each appropriate analyst	Water still Logbook in QA Office Filter changes-QA Office Other maintenance- QA Office
ECD wipe tests	Every 6 months			Analyst for that GC	QA Office
Fume Hoods	Annually			Outside expert	QA Office
Autoclaves	Temp, pressure, & time with each run. Killet ampules monthly in Bacti only, Cycle timing check quarterly			Analyst using the equipment	Routine Daily, Monthly, and Quarterly logbook- next to each autoclave
Laser Thermometer	Weekly against cooler thermometer Monthly against Calibrator	The emissivity settings shall be adjusted to bring the laser reading to 50°C +/- 1°C	Calibrator recertified annually	Customer service section	Customer service section Historical records placed in QA office at the end of each year

APPENDIX T

__ CORRECTIVE ACTION REPORT

Date Corrective Action Plan is due _____ Initiation Date ____/____/2016

LABORATORY CORRECTIVE ACTION

CORRECTIVE ACTION INITIATED BY: _____

- | | | | | | |
|--------------------------|--------------------|--------------------------|------------------------|--------------------------|--------------------------------------|
| <input type="checkbox"/> | Customer Service | <input type="checkbox"/> | Bench Analyst | <input type="checkbox"/> | Lab Management |
| <input type="checkbox"/> | Customer Complaint | <input type="checkbox"/> | Instr. Problem >3d | <input type="checkbox"/> | PT Study failure |
| <input type="checkbox"/> | Other | <input type="checkbox"/> | Sample(s) over HT | <input type="checkbox"/> | Internal audit & Inspection problems |
| | | <input type="checkbox"/> | Compromised Data | <input type="checkbox"/> | External inspection (EPA, other) |
| | | <input type="checkbox"/> | Control chart trending | <input type="checkbox"/> | Spot check |
| | | <input type="checkbox"/> | Other | <input type="checkbox"/> | Other |

Identify the problem: See attached Describe the nonconforming event or analysis result. Include details of staff member notified, date and time of notification, customer or outside involvement, analysis data, etc., as applicable. Attach any documentation that supports and/or supplements this description. If PT Failure, attach copy of PT report.

Corrective Action Plan: See attached Indicate the response(s) to the nonconformance, including all processes or raw data reviewed, QA or Mgmt. staff notified, analysis repeated, analysis halted, etc.

Prevention.

Describe policies and practices to be implemented by the laboratory as a result of the investigation of this problem/preventable error

Describe how the laboratory will monitor itself to ensure the effectiveness of newly implemented policies and practices.

Identify the individual(s) responsible for monitoring the effectiveness of implemented policies and practices.

Conclusion. (Discuss the effectiveness of the corrective action): See attached

C.A. completed by: _____ **Date** _____

QA Manager Approval: _____ **Date** _____

Corrective Action Closed by QA Manager: Signature _____ **Date:** _____

Save Typed Reports by CAR # & date to I:\Corrective Action Reports (Example: #20 Metals WS-3 PT 6-21-12)

QA/QC Terminology

Acceptance Criteria/Limits: specified limits placed on characteristic of a quality control item as defined in required methods. These limits are either statistically defined by historical Method performance or by specific method requirements.

Accuracy: the degree of agreement between an observed value and an accepted reference value. Accuracy includes a combination of random error (precision) and systematic error (bias) components which are due to sampling and analytical operations; a data quality indicator.

Analyst: the designated individual who performs the “hands-on” analytical methods and associated techniques and who is the one responsible for applying required laboratory practices and other pertinent quality controls to meet the required level of quality.

Audit: a systematic evaluation to determine the conformance to quantitative and qualitative specifications of some operational function or activity.

Batch: environmental samples that are prepared and/or analyzed together with the same process and personnel, using the same lot(s) of reagents. A preparation batch varies by method and is usually composed of one to twenty environmental samples of the same matrix, meeting the above-mentioned criteria and with a maximum time between the start of processing of the first and last sample in the batch to be 24 hours. An analytical batch is composed prepared environmental samples (extracts, digestates or concentrates) which are analyzed together as a group. An analytical batch can include prepared samples originating from various environmental matrices and can exceed twenty samples.

Bias: consistent deviation of measured values from the true value, caused by systematic errors in a procedure.

Blank: a sample that has not been exposed to the analyzed sample stream in order to monitor contamination during sampling, transport, storage or analysis. The blank is subjected to the usual analytical and measurement process to establish a zero baseline or background value. See **Method Blank**.

Blind Sample: a sub-sample for analysis with a composition known to the submitter. The analyst/laboratory may know the identity of the sample but not the composition. It is used to test the analyst or laboratory’s proficiency in the execution of the measurement process.

Calibration: to determine, by measurement or comparison with a standard, the correct value of each scale reading on a meter, instrument, or other device. The levels of the applied calibration standard should bracket the range of planned or expected sample measurements.

Calibration Curve: the graphical relationship between the known values, such as concentrations, of a series of calibration standards and their instrument response. See **Initial Calibration Curve**.

Calibration Method: a defined technical procedure for performing a calibration.

Calibration Standard: a substance or reference material used to calibrate an instrument.

Certified Reference Material (CRM): a reference material one or more of whose property values are certified by a technically valid procedure, accompanied by or traceable to a certificate or other documentation which is issued by a certifying body.

Chain of Custody: an unbroken trail of accountability that ensures the physical security of samples and includes the signatures of all that handle the samples.

Check Standard: a reference standard obtained from an independent source of the calibration standard used to verify the concentration of the calibration standard.

Confirmation: verification of the identity of a component through the use of the use of an approach with a different scientific principle from the original method. These may include, but are not limited to: Second column confirmation, Alternate wavelength, Derivation, Mass spectral interpretation, Alternative detectors, or additional cleanup procedures.

Conformance: an affirmative indication or judgment that a product or service has met the requirements of the relevant specifications, contract, or regulation; also the state of meeting the requirements.

Continuing Calibration Verification: the analysis of an analytical standard reference used to verify the initial calibration curve.

Corrective Action: the action taken to eliminate the causes of an existing nonconformity, defect, or other undesirable situation in order to prevent recurrence.

Data Audit: a qualitative and quantitative evaluation of the documentation and procedures associated with environmental measurements to verify that the resulting data are of acceptable quality (i.e., that they meet specified acceptance criteria).

Data Quality Objectives: Data Quality Objectives (DQOs) are statements of the data quality required from an investigative evaluation as established by the end user during the planning phase of a project requiring laboratory support. The DQOs are qualitative and quantitative statements of quality of data required to support specific decisions or regulatory actions.

Data Reduction: the process of transforming raw data by arithmetic or statistical calculations, standard curves, concentration factors, ECT. and collation into a more useable form.

Deficiency: an unauthorized deviation from acceptable procedures or practices, or a defect in an item.

Demonstration of Capability: a procedure to establish the ability of the analyst to generate acceptable accuracy.

Detection Limit: the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated degree of confidence. See **Method Detection Limit**.

Document Control: the act of ensuring that documents (and revisions thereto) are proposed, reviewed for accuracy, approved for release by authorized personnel, distributed properly and controlled to ensure use of the correct version at the location where the prescribed activity is performed.

Equipment Blank: a sample of analyze-free media that has been used to rinse common sampling equipment to check effectiveness of decontamination procedures.

Estimated Detection Limit: an estimate of the detection limit using one of the following:

- A. The concentration value that corresponds to an instrumental signal/noise in the range of 2.5 to 5.
- B. The concentration equivalent of three times the standard deviation of the replicate instrumental measurements of the analyte in reagent water or matrix of interest.
- C. That region of the standard curve where there is a significant change in sensitivity, ie break in the slope of the standard curve.
- D. Instrumental limitation

Estimated Value: a calculated value based on a reasonable approximation of the true value.

Field Blank: blank prepared in the field by filling a clean container with pure de-ionized water and appropriate preservative, if any, for the specific sampling activity being undertaken.

Holding Time: the period of time (usually in hours or days) from sample collection until sample preparation or analysis. The initial time is the time a grab sample is collected or the time the last aliquot of a composite is collected. The final time is the time sample preparation or analysis begins.

Holding Times (Maximum Allowable Holding Times): the maximum established times that samples (extracts, digestates, or concentrates) should be held prior to sample preparation or analysis. This time requirement can be expressed in various time units (i.e., hours, days, weeks, etc.). Holding times are evaluated in the same units as specified.

Initial Calibration Curve: the calibration curve with concentrations bracketing the range of interest performed at the beginning of the analytical process and again each day prior to sample analysis or at a frequency required by a specific method.

Internal Standard: a known amount of standard added to a test portion of a sample as a reference for evaluating and controlling the precision and bias of the applied analytical method.

Instrument Blank: a clean sample (e.g., distilled water) processed through the instrumental steps of the measurement process; used to determine instrument contamination.

Laboratory Duplicate: aliquots of a sample taken from the sample container under laboratory conditions and processed and analyzed independently.

Laboratory Control Sample (LCS): a sample matrix free from analytes of interest, spiked with verified known amounts of analytes from a source independent of the calibration standards or a material containing known and verified amounts of analytes.

Laboratory Control Sample Duplicate (LCS Dup): a second replicate laboratory control sample prepared in the laboratory and analyzed to obtain a measure of the precision of the recovery for each analyte

Laboratory Replicate Analyses: the measurements of the variable of interest performed identically on two or more sub-samples of the same samples within a short time interval.

Limit of Detection: the lowest concentration level that can be determined by a single analysis and with a defined level of confidence to be statistically different from a blank.

Matrix: the component or substrate that contains the analyte of interest. For the purposes of batch and QC requirement determinations, the following matrix distinctions shall be used:

- A. Aqueous: any aqueous excluded from the definition of Drinking Water matrix or Saline/Estuarine source. Includes surface water, groundwater, effluents, and TCLP or other extracts.
- B. Drinking Water: any aqueous sample that has been designated a potable or potential portable water source.
- C. Solids: includes soils, sediments, sludges, and other matrices with > 15% settable solids.

Matrix Spike (Spiked sample or fortified sample): a sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of the target analyte concentration is available.

Matrix Spike Duplicate (Spiked sample duplicate or fortified sample duplicate): a second replicate matrix spike prepared in the laboratory and analyzed to obtain a measure of the precision of the recovery for each analyte.

May: denotes permitted action, but not a required action.

Method Blank: a sample of a matrix similar to the batch of associated samples (when available) that is free from the analytes of interest, which is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences are present at concentrations that impact the analytical results for sample analyses.

Method Detection Limit: the minimum concentration of a substance (an analyte) that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minimum Quantitation Limit (MQL): the concentration level below which the variance of the results for a particular analyte (element or compound) exceeds the acceptable quality control criteria. This value corresponds to the lowest quantitative point on the calibration curve or the lowest demonstrated level of acceptable quantitation.

Non-targeted Analyte: an analyte that is detected by an analytical system, but the method has not specifically targeted the parameter. In this instance there would not have been a calibration standard used to calibrate the analytical system specifically for this analyte. (This would most often occur with analyses for organic parameters.) The identification (qualitative analysis) of the non-target analyte is generally based on a comparison to known or published information (e.g., spectra from published libraries) and is usually considered as tentative or provisional. The amounts reported are calculated relative to known concentrations of other reference materials and as reported would be considered to be estimated. These analytes are also often referred to as tentatively identified compounds (TICs).

Outlier: an observation (or subset of observations) which appears to be inconsistent with the remainder of that set of data.

Precision: the degree to which a set of observations or measurements of the same property, obtained under similar conditions, conform to themselves; a data quality indicator. Precision is usually expressed as standard deviation, variance, or range, in either absolute or relative terms. Precision refers to the level of agreement among repeated measurements of the same characteristic.

Preservation: refrigeration and/or reagents added at the time of same collection (or later) to maintain the chemical and/or biological integrity of the sample.

Proficiency Test Sample (PT): a sample, the composition of which is unknown to the analyst and is provided to test whether the analyst/laboratory can produce analytical results within specified acceptance criteria.

Pure Reagent Water: shall be water in which no target analytes or interferences are detected as required by the analytical method.

Quality Control Sample: an uncontaminated sample matrix spiked with known amounts of analytes from a source independent from the calibration standards. It is generally used to establish intra-laboratory or analyst specific precision and bias or assess the performance of all or a portion of the measurement system.

Quantitation Limits: the maximum or minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be quantified with the confidence level required by the data user.

Range: the difference between minimum and maximum of a set of values.

Raw Data: any original factual information from a measurement activity or study recorded in a laboratory notebook, worksheets, records, memoranda, notes, or exact copies thereof that are necessary for the reconstruction and evaluation of the report of the activity or study. Raw data may include photography, computer printouts, magnetic media, and recorded data from automated instruments. If exact copies of raw data have been prepared (e.g., tapes which have been transcribed verbatim, data and verified accurate by signature), the exact copy or exact transcript may be submitted.

Reagent Blank (Method Reagent Blank): a sample consisting of reagent(s), without the target analyte or sample matrix, introduced into the analytical procedure at the appropriate point and carried through all subsequent steps to determine the contribution of the reagents and the involved analytical steps.

Reference Material: a material or substance one or more properties of which are sufficiently well established to be used for calibration of the apparatus, the assessment of a measurement method, or for assigning values to materials.

Reference Method: a method of known and documented accuracy and precision issued by an organization recognized as competent to do so.

Reference Standard: a standard, generally of the highest meteorological quality available at a given location, from which measurements made at that location are derived.

Reporting Limit: also known as the Minimum Quantitation Limit (MQL) in data reporting.

Sample: a particular aliquot of a certain matrix collected at a specific location, date, time. This aliquot could be distributed over several different size or type containers depending on the analytical and/or preservation requirements.

Selectivity: the capability of a test method or instrument to respond to a target substance or constituent in the presence of non-target substances.

Sensitivity: the capability of a method or instrument to discriminate between measurement responses representing different levels (e.g., concentrations) of a variable of interest.

Shall: denotes a requirement that is mandatory whenever the criterion for conformance with the specification requires that there is no deviation. This does not prohibit the use of alternative approaches or methods for implementing the specification so long as the requirement is fulfilled.

Should: denotes a guideline or recommendation whenever noncompliance with the specification is permissible.

Spike: a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery efficiency or for other quality control purposes.

Standardized Reference Material (SRM): is a certified reference material produced by the National Institute of Standards and Technology or an equivalent organization and characterized for absolute content, independent of analytical method.

Target Analyte: an individual analyte that is specifically targeted for analysis by using a method designed and validated for the analyte. The technique will include calibration standard and other quality control parameters to calibrate and document the ability of an analytical system to successfully analyze for the target analyte.

Tractability: is the property of a result of a measurement whereby it can be related to appropriate standards, generally international or national standards, through an unbroken chain of comparisons.

Verification: confirmation by examination and provision of evidence that specified requirements have been met