QUALITY ASSURANCE MANUAL

Revision No. 9.4
July 24, 2015

OnSite Environmental Inc.
14648 NE 95th Street
Redmond, Washington 98052
(425) 883-3881

Approved By: _____ _____
Stacey Duran — Date
Laboratory QA/QC Officer

Approved By: _____ _____
Karl Hornyik — Date
Laboratory Director

Copy No.: _____

Issued To: _____

Date Issued: _____

Revision History

Origination Date: Unknown

Revisions 1.0 through 8.0
The status of the electronic files and originals of these versions is unknown.

Revision 8.1 (February 26, 2002)
A copy of this revision is filed in the QA/QC files. The electronic copy is on the server and has been backed up.

Revision 9.0 (August 28, 2003)
The Quality Assurance Manual underwent significant major upgrade in response to an EPA review, which noted many deficiencies in the document. The NELAC Manual was used to insure the Quality Assurance Manual more fully addressed the issues that regulators and clients would be looking for in our Quality Assurance Manual and to anticipate possibly getting accredited under NELAC in the near future.

Revision 9.1 (January 28, 2004)
The Quality Assurance Manual underwent the annual review. The organization chart, instrument list, and SOP list were updated to reflect changes since the last revision.

Revision 9.2 (November 19, 2008)
The Quality Assurance Manual underwent the annual review. The organization chart, instrument list, and SOP list were updated to reflect changes since the last revision.

Revision 9.3 (August 3, 2012)
The Quality Assurance Manual was revised as follows:
- Added a Data Integrity Policy
- Added a Data Integrity and Ethics Training section
- Updated instrumentation
- Updated maintenance SOP list
- Updated organizational chart
- Update floor plan
- Updated Appendix A
- Updated Appendix B

Revision 9.4 (July 24, 2015)
The Quality Assurance Manual was revised as follows:
- Annual Review
- Grammatical and spelling corrections
- Updated organizational chart
- Updated equipment list
- Updated maintenance SOP list
- Updated sample preparation SOP list
- Updated Appendix B

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Appendices

1.0 Quality Assurance Policy and Objectives

1.1 Mission Statement

OnSite Environmental Inc. provides high quality and timely chemical analyses to environmental, engineering and industrial clients.

1.2 Core Values

At OnSite Environmental Inc. we hold the following principles and values to be the most important, and we consider these values in making decisions in our business:

- Honesty
- Safety of our employees and community
- Good science
- Fairness
- Quality

1.3 Data Integrity and Ethics Policy

It is the policy of OnSite Environmental Inc. that appropriate and adequate Quality Assurance activities shall be implemented to document that all environmental data generated, stored, reported, or used is of known and adequate statistical quantity and quality to fulfill the needs of the primary data user.

Data shall be accurate, precise, complete, representative, comparable and, when required, legally defensible. This policy is intended to embrace both internal data, generated by internal Department monitoring and testing activities, and external data arising from regulated activities, contracts, grants, and cooperative agreements.

Ethics is a set of moral principles, a code of right and wrong, or behavior that conforms to accepted professional practices.

Fraud is an intentional act of deceit that may result in legal prosecution. Unethical actions become fraudulent when a law is violated. For example, it is unethical to change the acquisition date of a file for a chromatogram to meet holding times. It becomes fraud when the results are mailed or faxed to the client (wire fraud or mail fraud).

All employees at all times shall conduct themselves in an honest and ethical manner. Compliance with this policy will be strictly enforced. Unethical behavior is grounds for immediate termination.

Examples of unethical behavior include, but are not limited to the following:

- Artificially fabricating results
- Misrepresenting data such as peak integration, calibration, tuning, or system suitability
- Improper clock settings to meet holding times
- Intentional deletion of non-compliant data
- Improper manipulation of data or software
- Improper handling of data errors, non-compliant data, or QC outliers
- Lack of reporting unethical behavior by others

OnSite Environmental Inc. is committed to ensuring the integrity of our data, incorporating the highest appropriate standard of quality in all of our analytical programs.

Personnel shall not condone any accidental or intentional reporting of deceptive or misleading data.

If management requests personnel to engage in an activity that compromises data integrity, they have the right to refuse compliance with the request and to appeal the action through the Quality Assurance Officer.

Management shall not instruct subordinates to perform any practices that would violate this policy, nor will management discourage, intimidate or inhibit a staff member who may choose to appeal instruction under this agreement and will not retaliate against those who do so.

An employee must report any suspected unethical behavior or fraudulent activities to one of the following management representatives:

- Robert Wallace, Laboratory Director
- Karl Hornyik, Laboratory Manager, or
- Stacey Duran, Laboratory QA/QC Officer

If an employee wishes to remain anonymous, they may choose to describe the situation in an unsigned note to one of the above representatives. If the facts of the case are not clear after an investigation, a committee of senior employees may be asked to investigate the situation further and offer an opinion to the owners of the corporation.

1.4 Standards of Conduct

Our standards are those generally expected of employees in any professional business organization. Employees engaged in any of the following activities, or others deemed equally serious, will forfeit all benefits of employment:

- Theft or embezzlement
- Willful violation of safety or security regulations
- Conviction of a felony
- Working for a competitor
- Establishing a competing business
- Being intoxicated or under the influence of drugs or alcohol while at work
- Possession of drugs on the job
- Falsification of records
- Abuse, destruction, waste or unauthorized use of equipment, facilities or materials
- Gambling while on premises
- Chronic tardiness or absenteeism
- Breach of company or client confidentiality

This list of offenses is to highlight general company expectations and standards and does not include all possible offenses or types of conduct that will result in discipline or discharge. Management reserves the absolute right to determine the appropriate degree of discipline, including discharge, warranted in individual cases.

There may be no alcoholic beverages on the company premises, other than at times designated as company functions. At such times, non-alcoholic beverages will be provided as well.

Company policy requires employees to have no relationships or engage in any activities that might impair their independence or judgment. Employees must not accept gifts, benefits or hospitality that might tend to influence them in the performance of their duties. It is expected that there will be no employment by any competing company or any employment by any outside interest or engaging in any outside activity that might impair an employee's ability to render full time service to OnSite Environmental Inc.

1.5 Data Integrity and Ethics Training

Data integrity and ethics procedures in the laboratory include training, signed and dated integrity documentation for all laboratory employees, periodic monitoring of data integrity, and documented data integrity procedures.

Section managers uphold the spirit and intent by supporting integrity procedures, by enforcing data integrity procedures, and by signing and dating the data integrity procedure training forms.

Data integrity training is provided for all employees initially upon hire and annually thereafter.

Attendance at an initial data integrity training (part of new employee orientation) and the annual refresher training is recorded with a signature attendance sheet.

Specific integrity procedures for analyses involving chromatography (i.e. GC, GC/MS, etc.) are identified in SOP 1.12 Manual Integration. Training on this SOP is provided to all staff that performs chromatographic analyses.

Employees shall report all violations to management or Quality Assurance Officer.

Failure to report an integrity violation is an act of condoning the activity and is equivalent to having actually committed the violation.

The mechanism for confidential reporting of ethics and data integrity issues is:

- Unrestricted access to senior management or Quality Assurance Officer.
- An assurance that personnel will not be treated unfairly for reporting instances of ethics and data integrity breaches.
- Anonymous reporting.

Any potential data integrity issue is handled confidentially, to the extent possible, until a follow-up evaluation, full investigation, or other appropriate actions have been completed and the issues clarified. Inappropriate activities are documented, including disciplinary actions, corrective actions, and notifications of clients, if applicable. The documents are maintained for a minimum of 5 years.

Data integrity procedures are reviewed as part of the internal yearly audit and periodically monitored through in-depth data review of audit trails or records review as a part of internal monthly audits.

1.6 Confidentiality

During the course of business, employees are privy to data or information considered confidential or proprietary by our clients. This information includes, but is not limited to, test results, origin of samples, business relationship with client, any procedures and processes that they conduct or investigate, information about their business, our own laboratory procedures, and clients. All such information is kept strictly confidential and discussed only with corporate officers for the client's company. **The information will not be discussed with anyone**, even those within the client's company not designated as a contact, without prior permission from the client.

We are often contacted by government agencies or consultants hired by our clients. Without express permission, we only discuss the test methods or QC limits, and then solely if it is obvious from the conversation that the caller has a copy of the original report. Any discussion of the information listed in the above paragraph requires written permission from the designated contact. Permission by the designated contact may be granted by phone and should be followed in writing.

1.7 Complaint Resolution

Anytime a serious complaint is received, it is recorded in a permanent record so it can be tracked to insure resolution and brought to the attention of management.

A serious complaint is one that questions the validity of our results. Standard Operating Procedure 1.13 addresses the steps taken to document and resolve the complaint. In general, the nature of the complaint is documented and then given to the Laboratory Director. Someone is assigned to resolve the issues. The progress of the complaint is tracked during weekly staff meetings. Finally, after resolution, the complaint is fully documented and kept in the Laboratory QA/QC Officer's files for future reference.

1.8 Objectives

The overall objective of the quality assurance program for OnSite Environmental Inc. is to provide legally defensible analytical data that meet or exceed customer and regulatory requirements. To accomplish this, the following are performed:

- Maintain appropriate chain of custody of samples submitted to the laboratory.
- Maintain an effective, on-going quality control program to measure and verify laboratory performance.
- Monitor daily operational performance of the laboratory and provide timely corrective action for out of control events.
- Track corrective actions for resolution and appropriateness.
- Meet data requirements for accuracy, precision and completeness.
- Maintain traceability of measurements.
- Maintain complete records of data and reports generated by the laboratory.
- Provide sufficient flexibility to allow controlled changes in routine methods and Standard Operating Procedures to meet specific client data quality objectives.
- Maintain a data review process.
- Train employees in good analytical technique and in requirements of Standard Operating Procedures they are responsible to perform.

OnSite Environmental Inc. uses four controlled types of documents to establish the steps necessary to achieve these objectives.

Quality Assurance Manual (QAM) -- The primary Quality Control/Quality Assurance document for the laboratory is the Quality Assurance Manual. This manual provides an overview of the entire quality assurance program for OnSite Environmental Inc. The Laboratory Director, Laboratory Manager and Laboratory QA/QC Officer must approve the Quality Assurance Manual. The Quality Assurance Manual will be reviewed and revised, if necessary, at least annually.

Standard Operating Procedures (SOP) – Standard Operating Procedures document in sufficient detail the steps necessary to reproduce specific tasks within the laboratory. They are written to insure consistency from employee to employee and from day to day. They also serve as excellent training and reference documents for new employees. The author of the SOP, the Laboratory Manager and the Laboratory QA/QC Officer must approve Standard Operating Procedures. Each SOP will be reviewed and revised, if necessary, at least annually.

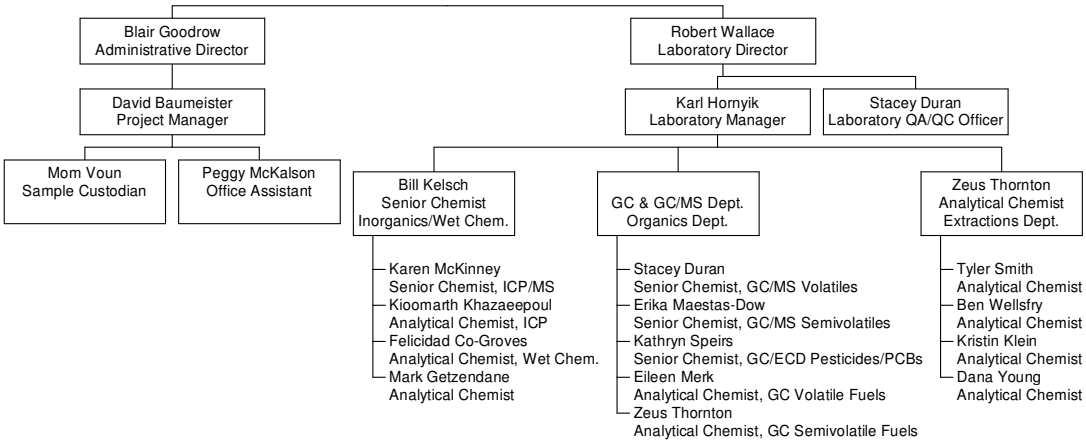
Laboratory Notebooks – Laboratory notebooks are used to document critical measurements and information such as sample weights, sample volumes, extract final volumes, dilutions, standard preparations, instrument maintenance, refrigerator, pipet and balance calibration and verification activities, etc. These bound notebooks are controlled documents that are tracked by the Laboratory QA/QC Officer. The procedure for controlling, maintaining and reviewing Laboratory Notebooks can be found in Standard Operating Procedure 1.01.

Quality Assurance Project Plans (QAPP) – These documents are typically created and provided by our clients. These documents may detail specific data quality objectives that are to be met for a specific client project. Since these data quality objectives may differ from what is internally defined by OnSite Environmental Inc.'s QA/QC program, it is absolutely required that the QAPP be submitted to OnSite Environmental Inc. for approval before work is started at the laboratory so that we can determine if the data quality objectives can be met and what, if any, changes need to be made in our Standard Operating Procedures, QA/QC program or reporting process to achieve these data quality objectives. OnSite Environmental Inc. will not be responsible for external data quality objectives that are not achieved unless we have approved a written QAPP prior to the beginning of the project. **Clients that submit work to us without an approved written QAPP specifically agree to the data quality objectives specified by OnSite Environmental Inc.'s internal QA/QC program.**

2.0 Organization and Personnel

2.1 Organization

The organization of the laboratory personnel is as follows:



2.2 Job Descriptions and Quality Assurance Responsibilities

The following positions are presently defined at OnSite Environmental Inc. Resumes of the key management positions can be found in Appendix A. Although the minimum requirements are desirable, equivalent education, experience or demonstrated transferable skills may be substituted for the requirements at the discretion of the Laboratory Director.

Laboratory Director

Position requires a minimum of a BA or BS in chemistry or related scientific field and at least eight years of laboratory experience. Management experience is highly desirable.

The Laboratory Director is ultimately responsible for the entire laboratory and the implementation of the quality assurance program.

The Laboratory Director shall certify that personnel with appropriate educational and/or technical background perform all tests for which the laboratory is accredited. Such information shall be documented.

Administrative Director

Position requires a minimum of a BA or BS, preferably in chemistry or other scientific field, and at least three years of management experience.

The Administrative Director is responsible for the front office activities, which include:

- Client services
- Payroll
- Personnel
- Purchasing
- Accounts payable
- Accounts receivable
- Contract administration

Laboratory Manager

Position requires a minimum of a BA or BS in chemistry or related scientific field and at least five years of laboratory experience at the analyst level. Management experience is highly desirable. The Laboratory Manager reports directly to the Laboratory Director.

The Laboratory Manager is responsible for:

- Managing and helping laboratory staff with production issues such as work schedules, workloads, instrument troubleshooting, and reporting of data
- Implementing and supervising the quality assurance program
- Supervising and maintaining the data review processes
- Performing Tier II data reviews
- Training staff

Laboratory QA/QC Officer

Position requires a minimum of a BA or BS in chemistry or related scientific field and at least four years of laboratory experience at the analyst level. Experience in data validation, statistics or previous QA/QC experience is highly desirable. The Laboratory QA/QC Officer reports directly to the Laboratory Director.

The Laboratory QA/QC Officer shall:

- Serve as the focal point for QA/QC and be responsible for the oversight and review of quality control data
- Be able to evaluate data objectively and perform assessments without outside (e.g., managerial) influence
- Have documented training and experience in QA/QC procedures
- Have a general knowledge of the analytical test methods for which data review is performed
- Arrange internal laboratory audits at least annually
- Arrange for performance evaluations and maintaining accreditations
- Notify laboratory management of deficiencies in the quality assurance program and monitor corrective action
- Maintain QA/QC documents and reports
- Monitor complaints and corrective actions for resolution
- Assist Laboratory Manager with Tier II data reviews

Project Manager

Position requires a minimum of a BA or BS, preferably in chemistry or other scientific field, and at least one year of laboratory experience at the analyst level. The Project Manager reports directly to the Administrative Director except for technical issues, which should be directed to the Laboratory Director, Laboratory Manager and/or Laboratory QA/QC Officer as appropriate.

Typical duties of the Project Manager include:

- Working with clients on establishing the analytical scope of each client project
- Reviewing client data quality objectives to make sure we can meet them
- Initiating specialized work plans for projects under QAPP guidance
- Supervising the purchasing, preservation and shipment of bottles and containers for client projects

- Supervising the Sample Custodian in receiving and maintaining proper chain of custody procedures of incoming samples
- Coordinating sample testing within holding time and turn around time restrictions within the laboratory
- Coordinating subcontracting of analytical work to other laboratories
- Performing Tier III data reviews
- Coordinating preparation of preliminary and final reports and electronic data deliverables

Senior Chemist

Position requires a minimum of a BA or BS, preferably in chemistry or other scientific field, and at least three years of laboratory experience at the analyst level. Experience and training may be substituted for educational requirements. Senior Chemists report directly to the department supervisor or the Laboratory Manager.

Senior Chemists duties include:

- Helping extract or digest samples
- Maintaining and calibrating instruments
- Preparing and analyzing samples
- Processing and reporting data
- Documenting non-conformances
- Performing Tier I and Tier II data reviews
- Troubleshooting and repairing analytical equipment
- Developing new methods

Analytical Chemist

Position requires a minimum of a BA or BS, preferably in chemistry or other scientific field, and at least one year of laboratory experience. Experience and training may be substituted for educational requirements. Analytical Chemists report to their department supervisor or to the Laboratory Manager in the absence of a department supervisor.

Analytical Chemists duties include:

- Helping extract or digest samples
- Maintaining and calibrating instruments
- Preparing and analyzing samples
- Processing and reporting data
- Performing Tier I data reviews
- Documenting non-conformances

Chemist

Position requires a minimum of a high school diploma and preferably at least one year of college chemistry. Chemists report to the department supervisor or to the Laboratory Manager in absence of a department supervisor.

Chemist duties typically include:

- Extracting or digesting samples
- Maintaining and calibrating instruments

- Preparing and analyzing samples
- Processing and reporting data
- Performing Tier I data reviews
- Documenting non-conformances

Sample Custodian

Position requires a minimum of a high school diploma. The Project Manager supervises the Sample Custodian.

Sample Custodian duties include:

- Logging in samples maintaining proper chain of custody protocols
- Documenting non-conformances
- Maintaining sample storage facilities
- Coordinating sample disposal
- Packing and shipping sample containers to clients
- Assisting Project Manager and Administrative Director in their duties

Office Assistant

Position requires a minimum of a high school diploma. The Project Manager supervises the Office Assistant.

Office Assistant duties include:

- Creating reports from submitted sample data
- Assisting Project Manager and Administrative Director in their duties

2.3 Personnel Training

OnSite Environmental Inc. has a formal training program covered in Standard Operating Procedure 1.06. In general, employees are familiarized with the Quality Assurance Manual, the Health and Safety Manual, the Employee Manual, and the Standard Operating Procedures they are expected to perform. A tour of the laboratory is given with attention given to the safety features of the laboratory such as fire extinguishers, first aid kits, eye wash stations, spill kits, evacuation routes, etc.

Training in first aid and CPR is offered to the employees every two years to make sure most employees have current certifications.

A training record is kept for each employee documenting when and what training has been received by the employee and by whom the training was given.

Each chemist must also pass a Demonstration of Capability procedure to document that they can achieve acceptable precision and accuracy from their technique with each of the technical Standard Operating Procedures they perform.

Employees are encouraged to attend external training courses to further their knowledge of analytical chemistry. Employees should contact the Laboratory Director for what steps they need to take to coordinate time off and reimbursement if the suggestion is approved.

2.4 Quality Assurance Document Control, Distribution and Revision

The Quality Assurance Manual, Standard Operating Procedures and Laboratory Notebooks are controlled documents. The revision history and distribution of these documents must be recorded using the Standard Operating Procedure 1.07 used to control documents. The Laboratory QA/QC Officer is responsible for document control.

Uncontrolled versions of these documents are acceptable but the distribution and revision distributed must also be documented as discussed in SOP 1.07. Only the Laboratory Director, Laboratory Manager and Laboratory QA/QC Officer may authorize the release of controlled documents.

Standard Operating Procedure 1.00 details the process required to create, review, revise, promulgate, retire and archive Standard Operating Procedures.

Standard Operating Procedure 1.01 details the process required to create, promulgate and archive Laboratory Notebooks and to do a QA/QC review of their contents.

The Quality Assurance Manual and appropriate Standard Operating Procedures are distributed by the Laboratory QA/QC Officer to each department for access by all employees.

2.5 Quality Assurance Assessments

2.5.1 Internal Audits

The Laboratory QA/QC Officer manages internal audits at two levels. A QC review meeting takes place once a month, and a lab-wide audit is performed once a year using Standard Operating Procedure 1.15.

In general, the monthly QC meeting consists of a review of any major QA/QC events or trends that may have occurred in the preceding month, as well as any applicable corrective measures taken to resolve these issues. In addition, random spot checks of data may be performed in order to assure compliance with standard laboratory operating procedures, including but not limited to:

- Check in and acceptance of sample into laboratory
- Storage temperature and location of client samples
- Sample extraction SOPs followed correctly
- Samples analyzed using correct SOP procedures
- Initial Calibration, Initial Calibration Verification and Continuing Calibration Verifications performed properly
- Quality Control limits met for precision and accuracy
- Non-conformances documented properly
- Corrective actions on non-conformances appropriate
- Data review process followed
- Raw and electronic data properly documented, gathered and archived
- Report generated correctly and without transcription errors
- Case narrative included and adequately addresses any issues with data

The annual audit is a more thorough look at all QA/QC operations for the laboratory. This audit is to occur in January of each year following Standard Operating Procedure 1.15. Following the audit, the Laboratory QA/QC Officer shall prepare a report summarizing the results of the annual audit and the

monthly audits from the previous year. The report will be presented to management for the management review process.

2.5.2 **Managerial Review**

In February of each year, the Laboratory Director, Administrative Director, Laboratory Manager, Laboratory QA/QC Officer and Project Manager will hold a meeting to conduct a review of its quality system and its testing and calibration activities to ensure its continuing suitability and effectiveness and to introduce any necessary changes or improvements in the quality system and laboratory operations. The review shall take into account the outcome of recent internal audits, performance audits, any changes in the volume and type of work undertaken, feedback from clients, corrective actions and other relevant factors. This procedure is covered in more detail in Standard Operating Procedure 1.16. The results from this meeting shall be documented and a copy of the report shall be kept in the Laboratory QA/QC Officer's files. The Laboratory Manager is required to address and document the resolution of any deficiencies.

2.5.3 **Performance Audit**

Performance audits are typically performed as part of the accreditation process. The audit can include three different activities including performance evaluation samples, reviews of QA/QC documents such as the Quality Assurance Manual and Standard Operating Procedures and onsite audits by the accrediting authority. The Laboratory Director, Laboratory Manager or Laboratory QA/QC Officer may also order a single blind or double blind performance evaluation if they feel it would be helpful in identifying QA/QC problems within the laboratory. The performance audit process is covered in Standard Operating Procedure 1.17. The report of any performance audits shall be kept in the QA/QC Officer's files and the Laboratory Manager is required to address and document the resolution of any deficiencies.

2.5.4 **Audit Review/Corrective Actions**

The review and corrective action process is included as part of the Internal Audit, Management Review and Performance Audit Standard Operating Procedures 1.15, 1.16 and 1.17. Standard Operating Procedure 1.18 details the process for documenting non-conformances and the associated corrective action.

3.0 Facilities and Equipment

3.1 **Facility Description**

OnSite Environmental Inc. is located at 14648 NE 95th Street, Redmond, Washington 98052. This facility supports all normal laboratory operations.

The volatiles department has its own HVAC system that is independent from the extractions lab, semivolatiles labs and inorganics lab.

Zoned heating and air-conditioning maintain temperature within the laboratory. Temperature is generally set for employee comfort at normal room temperature of 68-72 °F. If a specific test method requires a controlled temperature, humidity or other environmental control, such controls can be found in the individual test Standard Operating Procedure.

Floorplan


Office
Office
Office
Office
Office
SVOC
PCB
Pest
Herb
Office
Admin
Kitchen
Gases
Diesels
Extractions
Hazardous
Waste
Admin
Wash
Room
Compressed
Gas Tanks
Storage
Storage
Wet Chem
Walk
In
Fridge
Volatiles
Metals
Gas/BTEX
Metals
Volatiles
Metals
TOC

3.2 Instrumentation and backup alternatives

All GC and GC/MS departments have back-up instrumentation. The metals department uses the ICP/MS to backup all functions of the ICP. The ICP can partially backup the ICP/MS; however, it cannot achieve the ultra low detection limits of this instrument.

GC Volatiles

Daryl:
GC Serial #3235A46317
Hewlett Packard 5890 Series II GC/PID/FID
Tekmar/Hewlett Packard 2032 Automatic Liquid Sampler
Tekmar Liquid Sample Concentrator 2000

Hope:
GC Serial #3203A40474
Hewlett Packard 5890A Series II GC/PID
Varian Archon Autosampler
Tekmar Liquid Sample Concentrator 2000

GC/MS Volatiles

Albert:
GC Serial #3336A57367
MS Serial #3440A02022
Hewlett Packard 5890 Series II plus Gas Chromatograph
Hewlett Packard 5972A Mass Spectrometer
Varian Archon Autosampler
Hewlett Packard Liquid Sample Concentrator

Jessie:
GC Serial #US00033566
MS Serial #US94260049
Hewlett Packard 6890A Gas Chromatograph
Hewlett Packard 5973N Mass Spectrometer
Varian Archon Autosampler
Tekmar/Dohrmann Liquid Sample Concentrator 3100

Morris:
GC Serial #CN10745114
MS Serial #US74828211
Agilent Technologies 7890A Gas Chromatograph
Agilent Technologies 5975C Mass Spectrometer
Teledyne Tekmar SOLATek 72 Autosampler
Teledyne Tekmar Stratum Concentrator

Waldo:
GC Serial #CN10391147
MS Serial #US10402603
Agilent Technologies 7890A Gas Chromatograph
Agilent Technologies 5975C Mass Spectrometer
EST Analytical Centurion Autosampler
EST Analytical Encon Evolution Concentrator

GC Semivolatiles

Isaac:
GC Serial #2728A13937
Hewlett Packard 5890 GC/FID/FID
Dual Hewlett Packard Autosamplers

Teri:
GC Serial #US10403046
Agilent Technologies 6890N GC/FID/FID

Dual Agilent Technologies Autosamplers

Vigo: GC Serial #CN10741091
Agilent Technologies 7890A GC/FID/FID
Dual Agilent Technologies Autosamplers

GC/MS Semivolatiles

Ralph: GC Serial #3336A55281
MS Serial #3434A01677
Hewlett Packard 5890 Series II plus Gas Chromatograph
Hewlett Packard 5972 Mass Spectrometer
Hewlett Packard Autosampler

Corey: GC Serial #US00007773
MS Serial #US82321650
Hewlett Packard 6890 Gas Chromatograph
Hewlett Packard 5973 Mass Spectrometer
Hewlett Packard Autosampler

GC/ECD

George: GC Serial #3140A39359
Hewlett Packard 5890 Series II Gas GC/ECD/ECD
Hewlett Packard Autosampler

Frank: GC Serial #US92305459
Hewlett Packard 6890 plus GC/ECD/ECD
Hewlett Packard Autosampler

Ulysses: GC Serial #CN10741076
Agilent Technologies 7890A GC/ECD/ECD
Agilent Technologies Autosampler

Inorganics/Wet Chemistry

Precious (ICP) ICP Serial #ELO3068480
Varian Vista-MPX
Varian SPS-5 Autosampler

Xavier (ICP/MS) ICP/MS Serial #81DN3093002
Perkin Elmer NexION 300D ICP/MS
Elemental Scientific Inc. SC2 DX Autosampler

Yogi Mercury Analyzer Serial #040503QTA
CETAC Quick Trace Mercury Analyzer M-7500
CETAC ASX-520 Autosampler

Olympia UV/VIS Spectrophotometer Serial #AQA 113606
Thermo Spectronic Helios Aquamate

Koi Wet Chemistry Analyzer Serial #090588
AQ2 Discrete Analyzer, SEAL

Nemo Total Organic Carbon Analyzer Serial #H51104635289CS
Shimadzu TOC-UCSH Analyzer

3.3 Maintenance Activities

Preventative maintenance is an important part of a Quality Assurance Program. Maintenance activities are all described in their respective Standard Operating Procedures for the following equipment:

Refrigerator Maintenance	8.01
Calibration of Volumetric Pipets	8.03
Thermometer Calibration	8.04
Balance Calibration	8.05
Sonicator Calibration	8.08
Microwave Calibration	8.09
Maintenance of High Purity Water System	8.10
Laboratory Maintenance	8.13
Glassware Cleaning and Washing	8.14
Oven Maintenance	8.15
Fume Hood Maintenance	8.16
DryVap Procedure and Maintenance	3.11
RapidVap N2 Procedure and Maintenance	3.12
Centrifuge Procedure and Maintenance	3.13
Speed-Vap Procedure and Maintenance	3.14

4.0 Sample Processing

4.1 Sample Receiving and Storage

When samples arrive in the laboratory, the Sample Custodian logs the samples into the laboratory using Standard Operating Procedure 1.02. The Sample Custodian works closely with the Project Manager to make sure the analysis plan meets the customer requirements and that any special requirements detailed in a client quality assurance project plan are met and conveyed to the rest of the laboratory. This procedure includes the following steps:

- Verify samples for damage and proper preservation and temperature
- Verify samples arrived within acceptable holding time
- Verify the sample labels match the chain of custody
- Verify that the samples meet the acceptance policy of the laboratory
- Assign a project number to the sample group
- Assign a sample identification number to each sample and label each sample
- Log the required information into a sample notebook for record keeping
- Complete and sign the chain of custody and create a project file
- Document any non-conformances found
- Store samples in the proper refrigerators
- Complete and distribute the paperwork required for each testing protocol
- Prepare documents and shipments of samples to be subcontracted

Evidence of collection, shipment, receipt and laboratory custody until disposal must be documented. Documentation is accomplished by means of a chain of custody record that records each sample and the individuals responsible for sample collection, shipment and receipt. A sample is considered to be in custody if it is:

- In a person's actual possession
- In view after being in a person's actual possession
- Locked or sealed to prevent tampering
- In a secured area accessible only to authorized personnel

OnSite Environmental Inc. refrigerators and laboratory space are considered a secured area, thus chain of custody is considered to be maintained the entire time they are stored and processed while at our facility. This procedure is adequate and acceptable for the vast majority of our clients.

Some quality assurance project plans require a much stricter custody procedure. In such cases, the samples will be stored in locked refrigerators maintained by assigned sample custodians. Employees will have to obtain the samples from the sample custodian and sign for the samples. The employee will return the sample to the sample custodian immediately after using the sample unless it is to be consumed in analysis. Sample extracts will also be kept in locked refrigerators and the sample custodian will release them to the chemist when they are ready to analyze the sample extract. This procedure is detailed in Standard Operating Procedure 1.03.

4.2 Sample Preparation

The actual sample preparation steps are provided in the Standard Operating Procedure for each analytical method. The extraction and digestion departments also are careful to document proper chain of custody and non-conformances as the samples are being processed. The organic extraction and inorganic digestion departments maintain the following Standard Operating Procedures to maintain consistency in the actual practices they use to prepare samples:

Organic Extraction Department

♦ Separatory Funnel Water Extractions	Method 3510	SOP 3.08
♦ Solid Phase Extraction	Method 3535	SOP 3.10
♦ Ultrasonic Soil Extractions	Method 3550	SOP 3.07
♦ Microscale Solvent Extraction	Method 3570	SOP 3.15
♦ Microwave Extraction	Method 3546	SOP 3.16
♦ Waste Dilution	Method 3580	SOP 3.06
♦ Acid Cleanup	Method 3665	SOP 3.00
♦ Silica Gel Cleanup	Method 3630	SOP 3.03
♦ Florisil Cleanup	Method 3620	SOP 3.01
♦ Alumina Cleanup	Method 3611	SOP 3.02
♦ Sulfur Cleanup		SOP 3.05
♦ BOND ELUT SAX Cleanup		SOP 3.04
♦ Sonicator Calibration		SOP 8.08
♦ DryVap Procedure		SOP 3.11
♦ RapidVap Procedure		SOP 3.12
♦ Diazomethane Generation		SOP 3.09
♦ Centrifuge Procedure		SOP 3.13
♦ SpeedVap Procedure		SOP 3.14
♦ Glassware Washing and Cleaning		SOP 8.14

Inorganic Digestion Department

♦ Dissolved Metals Water Preparation	Method 3005	SOP 6.02
♦ Hotplate Water Digestion	Method 3010	SOP 6.03
♦ Hotplate Soil Digestion	Method 3050	SOP 6.06
♦ Microwave Assisted Water Digestion	Method 3015	SOP 6.04

♦ MARS Microwave Water Digestion	Method 3015	SOP 6.10
♦ Microwave Assisted Soil Digestion	Method 3051	SOP 6.07
♦ MARS Microwave Soil Digestion	Method 3051	SOP 6.11
♦ Water Extraction for Hex. Chromium		SOP 6.08
♦ Alkaline Digestion for Hex. Chromium	Method 3060	SOP 6.09
♦ Calibration of Microwave		SOP 8.09
♦ TCLP Preparation	Method 1311	SOP 6.00
♦ SPLP Preparation	Method 1312	SOP 6.01
♦ Glassware Washing and Cleaning		SOP 8.14

4.3 Sample Analysis & Data Generation

The sample analysis and data generation procedures for sample holding time, sample preparation, instrument tuning and calibration, quality control requirements and data reduction e.g. are detailed in the Standard Operating Procedure for each method. See Appendix B for a list of tests and the associated Standard Operating Procedure number for which OnSite Environmental Inc. currently maintains accreditation.

4.3.1 Manual Integrations

The initials of the analyst and the date of any manual integrations are required on all raw data. Standard Operating Procedure 1.12 gives examples of proper and improper integrations for different situations and how to document any manual integrations that are performed to correct for improper auto-integration.

4.3.2 Traceability of Standards and Calibrations

It is important to be able to trace and document the standards we purchase, prepare and use to calibrate and verify the calibration of our instruments. Standards and neat chemicals used to make analytical standards and spiking solutions internally are tracked by lot number and are assigned internal identification numbers as they are recorded in laboratory notebooks upon receipt from the vendor. Calibration standards and spiking solutions prepared from these materials are also tracked in laboratory notebooks and assigned identification numbers so they can be tracked during sample preparation and sample analysis. Standard Operating Procedure 1.11 details this procedure.

4.3.3 Initial Calibration Verification

It is OnSite Environmental Inc. policy that all initial calibrations for SW-846 methods must be verified with initial calibration verification (ICV) standards. This standard should be near the midpoint of the calibration curve and is typically the same concentration as the continuing calibration verification standard. The ICV should be from a different manufacturer unless this is not feasible. In this case, a standard with a different lot number may be selected from the same manufacturer.

The ICV requirement can be useful to identify the following issues:

- Manufacturer incorrectly made the standard
- Standard has degraded and needs to be replaced
- Errors in standard preparation by the analyst
- Identifying poor (non-linear) calibration curves

4.4 Data Review

OnSite Environmental Inc. employs a three-tiered data review process. Checklists are used to document each level of review. In general, the chemist

performs the Tier I review. The chemist then submits the data to a senior chemist, the Laboratory Manager, the Laboratory QA/QC Officer, or the Laboratory Director for a Tier II review. If corrections need to be made after the Tier II review, then the data is given back to the chemist to correct and resubmit to the Tier II process. Otherwise, the data is submitted to the Project Manager who coordinates the generation of the report and performs the final Tier III review before signing off on the data and submitting it to the client. Any changes in the data found during a Tier III review need technical agreement by the Laboratory Director, Laboratory Manager or Laboratory QA/QC Officer. Preliminary data submitted to the client must pass through the Tier II level and be clearly marked as preliminary data. The data can then be reviewed again at a later time before the final report is submitted to the client. This review procedure is detailed in Standard Operating Procedure 1.04.

4.5 Data Reporting and Electronic Data Deliverables

The Administrative Director and Project Manager coordinate report generation with assistance from the Office Assistant. The reporting requirements and the process to generate reports are described in Standard Operating Procedure 1.19. OnSite Environmental Inc. makes a concerted effort, whenever possible, to reduce the amount of hand entering of data to avoid transcription errors. Results from the instruments are electronically processed into a report using software or macros (typically Microsoft Excel). The results are then cut and pasted into the final report (Microsoft Word) with the help of macros so that data that is entered by hand is minimized.

The Laboratory Manager coordinates Electronic Data Deliverables (EDDs). Since each client requires their own format, Standard Operating Procedure 1.19 only addresses how to verify the EDD to insure its accuracy and agreement with the final report.

4.6 Back up of Electronic Data and Archiving of Data

The file server is backed up once a month. The data backed up includes all analytical data files, final reports and any other documents generated by the front office. A redundant back up copy is also made and stored at an off-site location.

The hardcopy of all the raw data and reports are kept on file for several months so staff has easy access to the data or reports. When the files begin to get full, the excess data is archived into file boxes, labeled and sent to a secure, third party, off-site archival company where the data can be accessed upon request. Data is maintained for a minimum of five years.

The back up and archival procedures are detailed in Standard Operating Procedure 1.05.

4.7 Sample and Waste Disposal

It is OnSite Environmental Inc. policy to store samples for 30 days following date collected for follow-up analyses and to give the client time to request that the samples be archived, returned or disposed. Clients are typically not charged for sample disposal unless the material is extremely hazardous and could not be disposed of in our normal waste streams. If the client wishes us to return the samples, the client can either pick them up at the laboratory or pay for us to ship them back under chain of custody. If the client selects to archive the samples, a small fee per sample per month is assessed. The procedures for sample return, archival and disposal are addressed in Standard Operating Procedure 1.08.

Organic sample extracts are kept, at a minimum, until the holding time specified by the method expires (typically 45 days or less). Inorganic sample digestates are kept, at a minimum, for 30 days.

When samples are scheduled for disposal, employees follow Standard Operating Procedure 1.08, which specifies that the samples be segregated into the following waste streams:

- Solid wastes (predominately hydrocarbon contaminated soils)
- Acidified aqueous wastes (predominately hydrochloric, nitric & sulfuric acid)
- Solvent wastes (predominately hexane, methylene chloride and acetone)
- PCB contaminated oils

Samples that do not fit these waste streams are set aside and handled on a case-by-case basis.

5.0 Quality Control

5.1 Definition of a Batch

Samples from different projects and clients may be batched together for quality control purposes unless a quality assurance project plan specifies that the quality control samples must be selected from that particular project. A batch can consist of up to twenty client samples in addition to any quality control samples that are required. The samples must be extracted, digested or otherwise prepared for analysis within a twelve-hour window. If more than twenty samples are to be extracted, a second batch of quality control samples must be generated. The types of quality control samples can differ depending on the method. Accuracy is assessed with any surrogates that are used and the spike blank and any matrix spike samples that are required by the method. Precision is assessed with any sample duplicates or matrix spike duplicates that are required by the method.

5.2 Method Blanks

Method blanks are used to make sure that the extraction and analysis procedures did not contribute contamination to the analysis.

5.3 Spike Blanks

Spike blanks are used to make sure that the analytes of interest can be accurately recovered from a blank matrix.

5.4 Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike samples are used to make sure the analytes of interest can be accurately recovered from the sample matrix. The matrix spike duplicate is also used to make sure the analytes can be repeatedly recovered in an accurate and precise manner.

5.5 Duplicate Samples

Duplicate samples are used to make sure that sample results can be reproduced in a precise manner.

5.6 Surrogates

Surrogate compounds are compounds similar to the analytes of interest that are added to the sample at known concentration in order to track the accuracy of the sample extraction and analysis.

5.7 Standard Reference Materials

Standard Reference Materials are typically soil or sediment samples obtained from third party sources that have been extensively tested and have certified concentrations or concentration ranges of analytes of interest. Some quality assurance project plans require us to process a standard reference material while processing their samples as an accuracy check on our extraction and analysis procedures. OnSite Environmental Inc. currently analyzes standard reference material only if required by a client's quality assurance project plan.

Clients are responsible for the cost of purchasing or providing standard reference materials if required by their project.

5.8 Trip and Storage Blanks

Trip and storage blanks are useful in tracking potential contamination issues with sample shipping and storage. These types of blanks are analyzed only if specified or submitted by the client or quality assurance project plan. Clients are typically charged for these samples.

5.9 Method Detection Limit Studies

Method detection limit studies are conducted annually for all accredited test methods. Standard Operating Procedure 1.20 specifies how this procedure is to be handled.

5.10 Demonstration of Capability

New methods must undergo a Demonstration of Capability (initial precision and accuracy study) to verify that the method is performing adequately. Standard Operating Procedure 1.21 specifies how this test is to be done. Each sample preparation technician and chemist as part of our training program also conducts these studies.

5.11 Solvent and Chemical Lot Checks

Each new lot of solvents, acids and bulk chemicals used to extract or digest samples is checked for interferences and contamination before it is used in the laboratory. Standard Operating Procedure 1.10 details how this is done.

6.0 Quality Assurance

6.1 Accuracy

Accuracy is generally expressed as percent recovery, which is calculated as:

$$\text{Percent Recovery (\%R)} = \frac{X_s}{C_t} * 100$$

Where: X_s is the observed concentration of the analyte, and
C_t is the true concentration of the analyte

The acceptable range for accuracy is determined by the method or by control charting of actual laboratory samples. The analyst is responsible for verifying that the surrogate, spike blank and MS/MSD percent recoveries meet the quality control limits. A non-conformance form and corrective action must be initiated if the analyte does not fall within the appropriate quality control limits.

6.2 **Precision**

Precision is generally expressed as relative percent difference, which is calculated as:

$$\text{Relative Percent Difference (RPD)} = \frac{|X_1 - X_2|}{\left[\frac{X_1 + X_2}{2}\right]} * 100$$

Where: X_1 is the concentration from the first replicate sample, and
X_2 is the concentration from the second replicate sample

The acceptable range for precision is determined by the method or by control charting of actual laboratory samples. The analyst is responsible for verifying that the duplicate or MS/MSD recoveries meet the quality control limits. A non-conformance form and corrective action must be initiated if the analyte does not fall within the appropriate quality control limits.

6.3 **Completeness**

Completeness is expressed as the percentage of data quality objectives that are expected to be met by OnSite Environmental Inc. This requirement is generally specified as part of a quality assurance project plan. Although OnSite does not track this information routinely or have a specific limit that we internally specify must be met, we strive to achieve 100% at all times.

6.4 **Representativeness**

In order that the reported results are representative of the sample received, OnSite Environmental Inc. makes a reasonable effort to assure that the samples are adequately homogenized prior to sampling for analysis. OnSite Environmental Inc. cannot control factors in the field affecting sample representativeness; thus, it is ultimately the client's responsibility to ensure that the sample submitted is well homogenized prior to submitting it to the laboratory.

6.5 **Control Charting & Control Limits**

OnSite Environmental Inc. routinely tracks and control charts surrogate percent recoveries, spike blank percent recoveries, MS/MSD percent recoveries and the relative percent difference of MS/MSD samples for all methods that require these quality control samples. The chemist is responsible for recording this information.

Control limits are derived from the control charts and are updated at least once a year. The control limit is established as three standard deviations from the mean of the data set. Standard Operating Procedure 1.22 provides additional guidance on generating and maintaining control charts and quality control limits.

6.6 **Non-conformances & Corrective Action**

Non-conformances are generated throughout the laboratory by sample receiving, the extractions/digestion departments, the different analytical groups, the Tier I/II/III review process, the front office, and from internal audits. In order to make sure that each non-conformance is documented and that a resolution was implemented, the non-conformance procedure is governed under Standard Operating Procedure 1.18.

The non-conformances and corrective actions that are generated during third party audits, internal audits, management reviews and through non-conformance

forms are summarized each month for the monthly quality assurance meeting as part of SOP 1.14. The progress for each item is tracked at the following monthly meeting until the item is finally resolved.

Appendix A

Resumes

Blair Goodrow *Administrative Director*

Key Qualifications: Blair has twenty-three years of experience in managing an analytical environmental laboratory. Prior to this, Blair acquired over six years of experience as a CPA at a public accounting firm. He brings to the position of administrative director and financial manager a varied background in business and finance.

Education: Certified Public Accountant, certified 1986

Post Graduate Studies, Accounting, San Jose State University, 1982

Bachelor of Arts, Business-Economics, University of California, Santa Barbara, 1980

Employment:

- **OnSite Environmental, Inc.**, Redmond, WA, 1992 - Present
  Administrative Director/Financial Manager. Responsible for the marketing of the company. Also responsible for the financial and administrative functions of the company.

- **Analytical Services, Inc.**, Kirkland, WA, 1989-1992
  Controller. Responsible for all financial, banking, and administrative functions of the company. Set-up and maintained a computerized accounting system. Prepared monthly financial statements and all required tax reports.

- **Clothier and Head, PS.**, Seattle, WA, 1983-1989
  Senior Accountant. Reviewed and compiled financial statements and projections. Prepared and reviewed corporate, partnership and individual tax returns. Supervised and trained staff accountants.

Karl P. Hornyik *Laboratory Director*

Key Qualifications: Karl has over twenty years of experience in environmental chemistry. He is experienced in analytical support of projects involving UST management services, remediation of contaminated sites, site assessments, groundwater monitoring, and waste characterization. Specializing in organic chemistry, Karl has served as an analyst in all sections of the laboratory and so has a comprehensive knowledge of individual analytical techniques as well as how they function together as a whole.

Education: Bachelor of Science, Pre-Medicine, University of Oregon, 1990

Employment:

- **OnSite Environmental, Inc.**, Redmond, WA, 1995 – Present
Laboratory Manager. Responsible for supervising all areas of laboratory operations, including extractions and analyses. Perform final data review for organic analyses. Ensure that all analytical equipment is properly operating and maintained. Responsible for development and management of laboratory data systems including custom hard copy and electronic data sets to meet specific client requirements.

- **OnSite Environmental, Inc.**, Redmond, WA, 1993 – 1995
QA/QC Officer. Responsible for the implementation and improvement of the laboratory's quality assurance/quality control program. Develop, monitor and maintain laboratory standard operating procedures. Maintain certifications with state accrediting authorities. Oversee analysis of performance evaluation samples and conduct in-house performance audits.

- **Laucks Testing Laboratories**, Seattle, WA, 1991 – 1993
GC Chemist. Extracted and analyzed soil, water and waste samples for volatiles and semivolatiles constituents.

Project Experience:

- **Tulalip Landfill Superfund Site**. Project involved analytical testing of pre-construction fill prior to the principal remedial action. Contaminants of concern were volatile organics, semivolatile organics, PCBs, pesticides, herbicides, and metals.

- **EPA Superfund Technical Assessment and Response Team (START)**.
Projects typically involve analytical testing of hazardous materials for characterization prior to determining remedial actions. Contaminants that are typically analyzed for are volatile organics, semivolatile organics, PCBs, pesticides, herbicides, and metals. The project requires adherence to specific reporting and deliverable requirements that include CLP type deliverables and electronic data deliverables (SEDD 2A).

- **Port of Seattle**. Environmental Analytical Laboratory Services Contract. Projects typically involve analytical testing of soil and groundwater contaminated with total petroleum hydrocarbons (TPH). Additional contaminants of concern are volatile organics, semivolatile organics, PCBs, pesticides, herbicides, and metals. The project requires adherence to specific quality control, reporting and deliverable requirements.

David Baumeister *Project Manager*

Key Qualifications: David has over twenty years of experience in environmental chemistry and environmental regulations. Prior to project management, David acquired over seven years of experience as a GC chemist and extractions supervisor. He brings to the position of project manager a solid and varied background in environmental chemistry. He has a thorough understanding of applicable analytical methods, limitations and reporting limits involved with all of the departments found in our laboratory.

Education: Bachelor of Arts, Biology, Emory University, 1990.

Employment:

- **OnSite Environmental, Inc.**, Redmond, WA, 1999 - Present
  Project Manager. Coordinates and manages complex analytical projects from inception to completion. Serves as a liaison between laboratory personnel and clients.

- **OnSite Environmental, Inc.**, Redmond, WA, 1994-1998
  GC Chemist-Extractions Supervisor. Analyzed environmental samples by GC methods. Supervised extractions of all laboratory samples.

- **Alden Technologies Inc.**, Seattle, WA, 1993-1994
  Extractions Supervisor. Supervised staff of chemists performing extractions of all laboratory samples. Coordinated daily operations of group. Method development.

- **Analytical Technologies, Inc.,** Tukwila, WA, 1992-1993
  Extractions Technician. Performed extractions on laboratory samples. Responsible for chemical inventory.

- **Weyerhaeuser**, Federal Way, WA, 1991-1992
  Physical Chemist. Analyzed paper products for quality control. Established QA/QC guidelines for various products.

Project Experience:

- **King County Department of Health**. Soils investigation involving the support and development of a database of environmental information regarding the extent of contamination from the Tacoma metal smelter.

- **Port of Seattle**. Environmental Analytical Laboratory Services Contract. Mr. Baumeister manages the environmental chemistry support for this contract. Projects typically involve analytical testing of soil and groundwater contaminated with total petroleum hydrocarbons (TPH). Additional contaminants of concern are volatile organics, semivolatile organics, PCBs, pesticides, herbicides, and metals. The project requires adherence to specific quality control, reporting and deliverable requirements.

- **Ecology and Environment, Inc.** Superfund Technical Assessment and Response Team (START). Mr. Baumeister manages the environmental chemistry support for this contract. The projects under this contract typically involve analytical testing of hazardous materials for characterization prior to determining remedial actions. Contaminants that are typically analyzed for are metals, pesticides, herbicides, PCBs, volatile organics, semivolatile organics, and TPH. Mr. Baumeister coordinates project specific quality control requirements and deliverables that included CLP type deliverables and electronic data deliverables (SEDD 2A).

- **Sound Transit Environmental Assessment Services.** Mr. Baumeister managed the environmental chemistry support for this project. The project involved testing of soil and groundwater in support of Phase 1 and Phase 2 Environmental Assessments for dozens of properties involving several different consultants. Contaminants of concern were total petroleum hydrocarbons (TPH), volatile organics, semivolatile organics, PCBs, pesticides, and metals. The project, at times, required expedited turnaround of analysis.

Stacey Duran *Laboratory QA/QC Officer*

Key Qualifications: Stacey has over sixteen years of experience in environmental chemistry. Stacey has training and/or experience in all organic sections of the laboratory. She brings to the position of Laboratory QA/QC Officer not only a varied background in environmental chemistry, but also a legal background.

Education: Bachelor of Science, Pre-Medicine, The Evergreen State College, 1996.

Employment:

- **OnSite Environmental, Inc.**, Redmond, WA, 2006 - Present
  Laboratory QA/QC Officer. Responsible for the monitoring and improvement of the laboratory's quality assurance/quality control program

- **OnSite Environmental, Inc.**, Redmond, WA, 2004 - Present
  GC/MS Chemist. Extract and analyze environmental samples for Volatile Organic Compounds by GC/MS methods.

- **OnSite Environmental, Inc.**, Redmond, WA, 1999 - 2004
  GC Chemist. Extracted and analyzed environmental samples for gasoline, BTEX, and VPH by GC methods. Created SOPs.

  Health and Safety Officer. Maintained MSDS's and OSHA and WISHA guide books; updated safety manual; conducted safety training; maintained injury reports; officiated monthly meetings; ordered safety related supplies; and scheduled yearly physicals, Hazmat training, air quality testing, CPR/first aid training, and fire extinguisher maintenance. Created cost estimate.

  Hazardous Waste Administrator. Monitored collection and disposal of lab-produced hazardous waste and wrote yearly reports for DOE.

- **OnSite Environmental, Inc.**, Redmond, WA, 1998 - 1999
  Organic Extraction Technician. Performed organic extractions of environmental samples; analyzed FOG samples on IR; and ran clean-up methods on samples when necessary.

- **Friedman & Bruya, Inc.**, Seattle, WA, 1998
  Laboratory Assistant. Cleaned glassware; performed organic extractions on environmental samples; and performed shipping and receiving duties.

- **The Office of the Attorney General,** Olympia, WA, 1988 - 1998
  Legal Secretary. Handled garnishment action; transcribed tapes; created case files; completed agreements; prepared and filed legal documents; authored correspondence; scheduled depositions; computed attorneys' time sheets; handled quarterly case status reports for office; trained secretaries in specialty areas; archived documents; worked with the Washington State Patrol, Internal Affairs Unit, on a confidential document production project including hiring, training, and supervising of additional employees; scanning hard copies of death penalty cases using a new imaging system into a computer while mitigating any problems along the way.

Appendix B

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8.07	Never issued
8.08	Sonicator Calibration
8.09	Microwave Calibration
8.10	Maintenance of High Purity Water System
8.11	Never issued
8.12	Never issued
8.13	Laboratory Maintenance
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8.15	Oven Maintenance
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