QUALITY ASSURANCE PROJECT PLAN (QAPP)
FORMER OLIVER PLOW WORKS
533 SOUTH CHAPIN STREET
SOUTH BEND, INDIANA
VRP #6001202

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COMMUNITY AND ECONOMIC DEVELOPMENT COMMISSION
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INTRODUCTION

The Indiana Department of Environmental Management (IDEM) requires all environmental monitoring and measurement efforts in the Voluntary Remediation Program (VRP) to participate in a centrally-managed quality assurance (QA) program.

This Quality Assurance Project Plan (QAPP) presents the organization, objectives, functional activities and specific QA and quality control (QC) activities associated with the Confirmation Sampling Event at the Former Oliver Plow Works VRP site. This QAPP also describes the specific protocols which will be followed for sampling, sample handling and storage, chain-of-custody, and laboratory (and field) analysis.

All QA/QC procedures will be in accordance with applicable professional technical standards, IDEM requirements, applicable government regulations and guidelines, as well as, specific project goals and requirements. This QAPP, prepared by Envirocorp, Inc., has been prepared in accordance with all IDEM QAPP guidance documents and the model QAPP presented in the VRP Resource Guide.

1.0 PROJECT DESCRIPTION

1.1 Site Location History/Background Information

The site, approximately 38 acres, is located at 533 South Chapin Street; Portage Township; St. Joseph County; South Bend, Indiana (Figure 1 - Site Location Map). The site currently contains 29 buildings and several smaller buildings and ancillary structures. The only buildings which were recently occupied are the first floors of Buildings 29 and 29A, used by Jamil Packaging Corporation for warehouse space and Building 1, most recently used by the City of South Bend for welfare services.

The past use of the site was traced to 1886. The site was developed by the Oliver Plow Works. The site was used for manufacturing of farm equipment. The site was sold in 1960 to White Motor Company (White Farm Equipment), who continued to manufacture farm equipment. The property was sold in 1985 to Allied Products. Manufacturing operations ceased in 1986 or 1987. The facility has been vacant since that time, except for the uses noted above.

1.2 Past Data Collection Efforts/Current Status

Five previous environmental investigations have been conducted on the subject property. In August 1988, Roy F. Weston, Inc. (Weston) conducted an "Environmental Liabilities Assessment" of the site for Allied Products, Inc.; South Bend, Indiana. Weston later conducted a "Phase II Environmental Liabilities Assessment" and another "Environmental Liabilities Assessment" of the site for Allied Products, Inc. in January 1990.

In the last half of 1992, Chemical Waste Management, Inc., (ENRAC Division) conducted a polychlorinated biphenyls (PCBs) removal operation on the transformer pad located south of Building 30, the power plant. All transformers were drained of PCB-containing fluids. Approximately 264.53 tons of soil was removed at the time due to PCB contamination. All remaining soils were found below regulatory limits

Envirocorp, Inc. (Envirocorp) performed a Phase I "due diligence" investigation of the site for the City of South Bend in 1998. A number of "Recognized Environmental Conditions" (RECs) were noted during this investigation, including the former underground storage tank (UST) areas, potential hazardous waste storage areas, and areas with stained soils.

A Phase II Site Assessment was performed by Envirocorp in the fall of 1999, to address the RECs noted in the Phase I and determine the impact of site activities on localized groundwater. This investigation also included an asbestos survey of the buildings at the site, along with the installation of 41direct push soil borings, the analysis of select soil samples for volatile organic compounds (VOCs), polynuclear aromatics (PNAs), Resource Conservation and Recovery Act (RCRA) metals (silver, arsenic, barium, cadmium, chromium, lead, mercury, and selenium), and PCBs, and sampling and analysis of the groundwater for RCRA metals, VOCs, and PNAs. A trenching investigation was undertaken as part of this investigation in December 1999 into areas identified by an anonymous former employee of Oliver Plow as locations of past disposal of waste paints and solvents.

The results of the investigations completed by Envirocorp indicate the soils at the site do not appear to be impacted above Tier II cleanup levels for the listed chemicals of concern (COCs), except as noted in the RWP. Tetrachloroethylene was noted in a groundwater sample in an upgradient well (MW-1) above Tier II residential and non-residential levels, but was not found above the residential Tier II levels in any of the other eight installed monitor wells.

1.3 Project Scope and Objective

The intent of this investigation is to provide the needed data to allow for this site to obtain a certificate of closure and covenant not-to-sue for surface and subsurface soils. The groundwater will be addressed on a regional basis using a strategy currently being developed by the City of South Bend.

1.4 Sample Network Design and Rationale

The size of the area of investigation, approximately 38 acres, is outside of the normal scope of investigations (approximately 1 acre) described in the Voluntary Remediation Program (VRP) resource guide, July 1996. We have developed site specific Data Quality Objectives (DQO) and a Conceptual Site Model (CSM) for this investigation using the techniques and references contained in the Risk Integrated System of Closure (RISC) documents issued in February 2001 to develop an appropriate sampling strategy to properly characterize the site. These are included as attachments to the RWP.

We have divided the site into 12 areas. This division is based upon the data obtained from the previous investigations, historical information, and other factors described in the CSM. The analysis parameters for the soils in each area is based upon the potential presence of COCs. At least one sample from each area will be assessed for all of the parameters requested to be covered in the covenant not-to-sue.

The soil samples will be obtained using direct push sampling to a maximum depth of 12 feet. These samples will be assessed using field analysis and segregated for fixed laboratory analysis using the Ranked Set Sampling Technique. This is discussed further in the DQM and the Confirmation Sampling Plan.

1.5 Parameters to be Tested and Frequency

Parameters to be assessed as part of the investigative effort (Primary Parameters) to obtain the covenant not-to-sue include:

- Volatile Organic Compounds (VOCs) as defined under SW-846 Method 8260
- Semi-Volatile Organic Compounds (SVOCs) as defined under SW-846 Method 8270
- Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver
- PCBs

The samples will be assessed as described in the Project Completion Sampling Plan.

1.6 Intended Data Usage and Data Quality Objectives

The end use of the data will be the main determiner of the DQOs for each set of data. All of the data from the fixed laboratory will be used to obtain the covenant not-to-sue, and will be performed at DQO Level 4. The screening tests will be at DQO level 1. If additional investigation is required, this plan will be revised to indicate the proper level of data quality.

The DQOs, and when they will be used, are defined below, and a discussion of the use of DQOs in this investigation follows the DQO description.

Screening (DQO Level 1): This provides the lowest data quality, but the most rapid results. It is often used for health and safety monitoring at the site, preliminary comparison to applicable or relevant and appropriate requirements (ARARs), initial site characterization to locate areas for subsequent and more accurate analyses, and for engineering screening of alternatives (bench scale tests). These types of data include those generated on-site through

the use of field instruments such as an HNu, pH meter, field XRF meter, immunoassay kits, conductivity meter, and other real-time monitoring equipment at the site.

Field Analyses (DQO Level 2): This provides rapid results and better quality than in Level 1. This level may include mobile laboratory generated data depending on the level of quality control (QC) exercised.

Engineering (DQO Level 3): This provides an intermediate level of data quality and is used for site characterization. Engineering analyses may include mobile laboratory generated data and some analytical laboratory methods (e.g., laboratory data with quick turnaround used for screening, but without full QC documentation).

Confirmational (DQO Level 4): This provides the highest level of data quality and is used for purposes of risk assessment, evaluation of remedial alternatives, and verification that cleanup standards have been met. These analyses require full analytical and data validation procedures in accordance with United States Environmental Protection Agency (USEPA) recognized protocol. Data validation procedures will include a review by Mr. Furfaro, a degreed chemist, to assess the quality of the data obtained. This review will include an assessment of all sample holding times, sample analysis parameters, any matrix interferences, duplicates, matrix spike and matrix spike duplicate data, and all other laboratory supplied quality assurance (QA) QC data to validate the sample results before use in this project.

Non-Standard (DQO Level 5): This refers to analyses by non-standard protocols, for example, when exacting detection limits or analysis of an unusual chemical compound is required. These analyses often require method development or adaptation. The level of QC is usually similar to DQO Level 4 data.

The above criteria has been used to determine the level of QC for the data gathered during the project.

The following table illustrates the sample collection and analysis procedures for each sample matrix.

	Soils - Collected via Direct Push
Primary Parameters - Fixed Lab	-VOCs, SVOCs, - PCBs, RCRA Metals - One Duplicate per every 10 samples -One Matrix Spike/Duplicate per every 20 samples
Screening Parameters - Field	- Total Petroleum Hydrocarbons - PCBs by Immunoassay Techniques - Lead and Arsenic by a hand held XRF

All fixed laboratory parameters will be analyzed at DQO Level 4, and all screening parameters will be analyzed at DQO Level 1.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITY

The organization of the personnel involved in this project, the job title, and responsibilities include:

- *Richard T. Brown, Regional Manager:* Responsible for coordination of Envirocorp efforts and personnel. Final review and approval of all documentation and expenditures.

- *Michael A. Furfaro, Geochemist:* Project Manager responsible for the day to day management of the project. Designated contact person for the Client and IDEM for all mailings and other matters.

- *R. Joseph Trojan, Geologist:* Responsible for ensuring soundness of investigation and assisting in interpretation of all geologic information.

- *Eric P. Henderson, Geologist:* Responsible for ensuring soundness of investigation and assisting in interpretation of all geologic information

- *Billy W. Nievar, Senior Engineer*: Responsible for the oversight of sampling design network and other engineering related tasks.

- *Christopher Burgo, Senior Technician*: Responsible for various field activities and operations.

3.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

The overall QA objective is to develop and implement procedures for field sampling, chain-of-custody, laboratory analysis, and reporting which will provide results that are scientifically valid, and the levels of which are sufficient to meet DQOs. Specific procedures for sampling, chain-of-custody, laboratory instrument calibration, laboratory analysis, reporting of data, internal quality control, preventive maintenance of field equipment, and corrective action are described in other sections of this document. The purpose of this section is to state the specific, required QA objectives for accuracy, precision, and representativeness.

3.1 QA Objectives Defined

3.1.1 Accuracy

Accuracy is the closeness of agreement between an observed value and an accepted reference value. The difference between the observed value and the reference value includes components of both systematic error (bias) and random error. Laboratories assess the overall accuracy of their instruments and analytical methods (independent of sample or matrix effects) through the measurement of "standards," materials of accepted reference value.

Accuracy will vary from analysis to analysis because of individual sample and matrix effects. In an individual analysis, accuracy can be measured and expressed in terms of the recovery of surrogate compounds (organic analyses) or recovery of spiked compounds (inorganic analyses). This gives an indication of expected recovery for analytes tending to behave chemically like the spiked or surrogate compounds.

3.1.2 Precision

Precision is the agreement among a set of replicate measurements without consideration of the "true" or accurate value: i.e, variability between measurements of the same material for the same analyte. Precision is measured in a variety of ways including statistically, such as calculating variance or standard deviation.

3.1.3 Representativeness

Representativeness expresses the degree to which the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, process condition, or an environmental condition. Representativeness is a qualitative parameter which is

dependent upon the proper design of the sampling program and the laboratory QC protocol. We describe our efforts to accurately represent the conditions at the site in the DQO.

3.2 Level of Quality Control Effort

It is required that field blanks, trip blanks, field duplicates, and matrix spike samples are analyzed to assess the quality of the data resulting from the field sampling program. Laboratory duplicates (investigative samples split by the laboratory *in addition to* matrix spike/matrix spike duplicate [MS/MSD] samples) may also be analyzed. Field and trip blanks, consisting of distilled water, will be submitted to the analytical laboratory with the field samples. Field blanks are analyzed to check for procedural contamination at the site which may cause sample contamination and will be used with non-dedicated sampling equipment only. Trip blanks are used to assess the potential for volatile organic contamination of samples due to contaminant migration during sample shipment and storage. Field duplicate samples are analyzed as a check of sampling and analytical reproducibility; laboratory duplicates provide an estimate of the reproducibility of measurement. Matrix spikes provide information about the effect of the sample matrix on digestion and measurement methodology. All matrix spikes are to be performed in duplicate.

The field screening will have standards analyzed at least twice a day, at the beginning and end of each day, to determine the drift in the method.

3.3 Level of Effort by the Laboratories

The following are the *required* minimum QA/QC measures for DQO level 2 data.

a. A field blank will be submitted to the laboratory with the investigative samples and analyzed for the same parameters as the investigative samples. The minimum required is one per every 10 investigative samples.

b. A trip blank will be taken to the site and then analyzed by the laboratory for VOCs for all sites at which volatile organic analysis (VOA) is one of the analytical parameters. The trip blank consists of distilled deionized ultra pure water placed in two VOA vials, which are transported to the sampling site unopened, stored with the investigative samples, and kept closed until analyzed by the laboratory. One trip blank is required for each shipping container.

c. Field duplicates will be provided for each matrix sampled. The field duplicate will be analyzed for all parameters for which the investigative samples of that matrix are analyzed. The minimum number of field duplicates required is one per every 10 samples, or if there are fewer than 10 samples per matrix, 1 per matrix.

d. A matrix spike/matrix spike duplicate sample set will be analyzed, 1 for every 20 samples, or if fewer than 20 samples per matrix, 1 for each matrix sampled. The MS/MSD is an investigative sample which (for each applicable analytical parameter for that sample matrix) is split by the laboratory, spiked with target analytes for that analytical procedure, and analyzed with the other samples of that matrix. Samples chosen as MS/MSD should be selected prior to the sampling event so that sufficient sample volume is acquired; double volume is required for organic analyses.

e. The laboratory will run a method (preparation) blank at the beginning of each analytical run. If not, all samples are to be completed in one day; a minimum of one method blank per sample matrix per analytical method must be run at the beginning of each sample batch analyzed each day.

f. Upon initiation of an analytical run, the laboratory will perform calibration procedures as instructed by the analytical method(s) used, and where applicable, according to instrument manufacturer specifications. During the length of the run, continuing calibrations will be performed at the frequency specified. Where applicable, calibration blanks will be included in the calibration procedure.

g. Surrogate standards will be added to all samples for organic analysis (VOA, SVOA, pesticides/PCBs). Surrogate recovery will be used to assess accuracy of organic analyses.

h. Accuracy of inorganic analysis will be assessed by the percent recovery of spiked analytes.

i. At a minimum, precision will be estimated by calculating the relative percent difference (RPD) between MS and MSD samples and the RPD between duplicate samples. The acceptable amount of precision will be between 70% to 130%.

j. Sample chain-of-custody will be maintained and documented as outlined in Section 5.0. Copies of the chain-of-custody sheets will be submitted to IDEM as part of the analytical data package.

k. Data, documentation, reports, and other project records will be maintained for a minimum of three years after the date of submission of the final report or as required by IDEM, whichever is longer.

l. The control limits used, as outlined in the analytic method, will be maintained. Additional QC limits or measures specified in the analytical methods used must also be maintained.

3.4. Control Limits

Control limits are the maximum and/or minimum values defining a range for a specific parameter, as outlined within each analytical procedure, is considered to satisfactorily meet QC criteria. When the parameter falls outside that range, the procedure is considered to be out-of-control. Whenever the analytical procedure is or becomes out-of-control, corrective action must be taken to bring the analysis back into control. The corrective action must include: (1) finding the cause of the problem; (2) correcting the problem; (3) demonstrating the problem has been corrected by re-analyzing appropriate laboratory reference samples; and (4) repeating the analyses of any investigative samples that may have been affected by the control problem. The control limits used in this investigation will mirror the USEPA contract laboratory program, typically between 80% to 120% recovery.

Exceptions will be made on a case-specific basis. If the control limit is technically impracticable for a particular sample or analysis, documentation and narrative explanation should be submitted with the data report and raw data. The documentation will include evidence that a good faith effort was made to meet the control limit; this will generally include two attempts to analyze the sample.

4.0 SAMPLING PROCEDURES

This section will provide supplemental information similar to the Field Sampling Plan.

4.1. General

Field records will be written in indelible ink in a bound field notebook with prenumbered pages. All documentation errors will be corrected by drawing a single line through the error so that it remains legible; the error will then be initialed by the responsible individual and the date of the change noted. The correction will be written adjacent to the error. Each page in the bound field notebook will be signed and dated by the individual responsible for the

contents, and any blank space that remains on the page will be crossed out. Any deviations to this procedure will be reported to the project manager for review and correction.

4.2. Sample Collection

Sample collection information can be recorded in a bound field notebook with prenumbered pages, on a pre-printed form (Attachment A), or by other means. The following information will be documented. The samples will use unique identifiers.

For each sampling event

The site name and location, date, starting and ending times, weather, names of all people involved in sampling activities, level of personal protection used, documentation of adherence to protocol, any changes made to planned protocol, names of visitors to the site during sampling and reason for their visit, unusual observations, and signature of the person recording the information.

For each individual sample

A detailed description of location, any measurements made, the unique sample number assigned, the time the sample was taken, physical description of sample, depth from which sample was collected, whether grab or composite (if composite, how composited), equipment used to collect the sample, volume and number of sample containers, how sample is preserved, and signature of sampler. Each field duplicate will be given its own unique sample number; the description should include the unique sample number of its duplicate.

4.3. Maps and Drawings

A site map will be prepared based upon a primary drawing by a licensed surveyor that accurately documents the sample collection points and locations of monitoring wells. All sample locations not previously located on the site map will have it's horizontal location documented using a minimum of two reference points.

4.4. Chain-of-Custody Records

Sample custody will be discussed in detail in Section 5. Chain-of-custody records are initiated by the samplers in the field. The field portion of the custody documentation should include: (1) the project name; (2) signatures of samplers; (3) the sample number, date and

time of collection, and whether the sample is grab or composite; (4) signatures of individuals involved in sample; and (5) if applicable, air bill or other shipping number.

4.5. Calibration Records and Traceability of Standards/Reagents

If field or mobile laboratory analyses are performed, calibrations will be performed and documented. Calibration is a reproducible reference point to which all sample measurements can be correlated. A sound calibration program will include provisions for documentation of frequency, conditions, standards, and records reflecting the calibration history of a measurement system. The accuracy of the calibration standards is important, because all data will be in reference to the standards used. A program for verifying and documenting the accuracy of all working standards against primary grade standards will be routinely followed.

5.0 SAMPLE CUSTODY

5.1. Custody Defined

The custody sequence can be divided into three major segments: collection (field), laboratory analysis, and final evidence files. Within any of these segments, a sample or evidence file is in someone's custody if:

- it is in his/her actual physical possession;
- it is in his/her view, after being in his/her physical possession;
- it is in his/her physical possession, and he/she has placed it in a secure (locked) location; or
- it is in a designated secure area.

5.2. Field Chain-of-Custody Procedures/VRP Field Custody Requirements

a. The field sampler is personally responsible for the care and custody of the samples until transferred.

b. The sampler will keep a written record of the sampling operation and samples' identities. This documentation will include the following:

- information noted on the Site Information Sheet, included in Attachment A;
- a site map, as described in Section 4.3 above, accurately indicating sample collection points;

- information noted on the Sample Information Sheet or the Groundwater Sample Information Sheet, in Attachment A, for *each* sample collected including blanks, spikes, and duplicates; and
- a chain-of-custody document as provided by the laboratory.

c. Each sample will be placed in a container supplied by the laboratory with a completed sample label attached. The sample label will include, at a minimum: the sample number; the date and time sampled; the sample location; the parameters for which the sample is to be analyzed; and the sampler's initials. The nomenclature of the samples will be consistent with the previous investigations at the site, with the next sample number following the last sample number from the previous investigation.

d. Samples remain in the custody of the sampler until transfer of custody is completed. This consists of:

- delivery of samples to the laboratory sample custodian; and
- signature of laboratory sample custodian on chain-of-custody document as receiving the samples and signature of sampler as relinquishing samples.
- if a carrier is used to take samples between the sampler and the laboratory, the carrier will also sign the chain-of-custody form (as receiver from sampler and relinquisher to laboratory).

5.3. Laboratory Chain-of-Custody Procedures VRP Laboratory Custody Requirements

The following procedures will be followed by the laboratory.

a. All samples will be handled by the minimum number of people possible.

b. The laboratory will set aside a secured sample storage area consisting of a clean, dry, refrigerated, isolated room. This room should be capable of being locked if deemed necessary.

c. A specific person or persons will be designated custodian(s). All incoming samples will be received by the custodian who will indicate receipt by signing the chain-of-custody form.

d. The sample custodian will maintain a bound logbook or other official recordkeeping system to record the following information for each sample: person delivering sample;

person receiving sample; date and time received; source of sample; sample identification of log number; mode of transportation to laboratory; and condition in which sample received. A standardized format will be maintained.

e. The custodian will ensure that samples which are heat-sensitive, light-sensitive, radioactive, or which require special handling in other ways, are properly stored and maintained prior to analysis.

f. The analytical area will be restricted to authorized personnel only.

g. After sample analyses are complete, the laboratory may discard samples only with the concurrence of the sampler. If sample is discarded, time and date will be recorded. Analytical data is to be kept secured and released to authorized personnel only.

5.4. Final Evidence Files Chain-of-Custody Procedures

Envirocorp is the custodian of the evidence file. The evidence file will include: all reports; logs; field notebooks and other field records; pictures; contractor and subcontractor reports; correspondence; originals of laboratory reports, notebooks, and data; chain-of-custody documents; IDEM communications; and other records relevant to the VRP project. Envirocorp will maintain the evidence file in a secured, limited access area until all submittals for the VRP project, including the final report:

- have been reviewed and approved by the IDEM; and
- for a minimum of three years past the submittal date of the final report.

Securing the evidence file for a longer period of time is at the discretion of the City of South Bend.

6.0 CALIBRATION PROCEDURES AND FREQUENCY

6.1. Field Instruments/Equipment

Equipment to be used doing the field sampling will be examined to certify that it is operating condition. This includes checking the manufacturing's operating manual and the instruction and the instructions for each instrument to ensure that maintenance requirements are being observed. Field notes from previous sampling trips will be reviewed so that the notation on any prior equipment problems are not overlooked, and all necessary repairs to equipment

have been carried out. Calibration of field instruments is governed by the specific standard operating procedures (SOP), the USEPA 4000 series method, or manufacturers' recommendation for the applicable field analysis method, and such procedures take precedence over the following general discussion.

Calibration of field instruments will be performed at the intervals specified by the manufacturer or more frequently as conditions dictate. Field instruments may include an Organic Vapor Analyzer, a field XRF, or Organic Vapor Photoionization Detector. In the event that an internally calibrated field instrument fails to meet calibration/checkout procedures, it will be noted in the field log and returned to the manufacturer for service.

All field screening will follow USEPA method requirements including SW-846 Method 4030 and Method 4020 for PCBs for total petroleum hydrocarbons (TPH).

6.2 Laboratory Analysis

All analysis will follow the procedures stated in the USEPA SW-846 manual. The analytical methods to be used include:

VOCs - Method 8260
SVOCs - Method 8270
Metals - Appropriate 6000 Series Method
PCBs - Method 8080

7.0 ANALYTICAL PROCEDURES

The laboratory used during this project, TestAmerica, follows all guidelines as required under the SW-846 procedures manual. A copy of the laboratory QA/QC manual is included in Appendix B of this document.

8.0 INTERNAL QUALITY CONTROL CHECKS

The laboratory used during this project, TestAmerica, follows all guidelines as required under the SW-846 procedures manual. A copy of the laboratory QA/QC manual is included in Attachment B of this document.

9.0 DATA REDUCTION, VALIDATION, AND REPORTING

Envirocorp will review, validate, and reduce all data that is received. This review will include a review of all sample holding times, sample analysis parameters, any matrix interferences, duplicates, matrix spike and matrix spike duplicate data, and all other laboratory supplied QA/QC data to validate the sample results before use in this project.

Envirocorp will tabulate all detected analytes (data reduction) above method detection limits and review all qualified data to assure that the detection limits meet or exceed the Tier II non-residential cleanup goal. Any outliers or flagged data detected during this process will be assessed to assure that the problem does not interfere with the objectives of this project. This process will be documented by a memo from the reviewer of the analytical data to the file.

All data will be included in the first document submitted to the state after it is generated.

10.0 PERFORMANCE AND SYSTEM AUDITS

The laboratory used during this project, TestAmerica, follows all guidelines as required under the SW-846 procedures manual. A copy of the laboratory QA/QC manual is included in Attachment B of this document. Field audits of the screening methods will be performed on a daily basis. This will include running the calibration sample at least twice a day, once after the lunch break and once at the end of the day. If the method is found to have more than a 20% drift over the day, the impact on the drift on the RSS technique will be reviewed by the project manager and documented in the field notebook.

11.0 PREVENTIVE MAINTENANCE

The laboratory used during this project, TestAmerica, follows all guidelines as required under the SW-846 procedures manual. A copy of the laboratory QA/QC manual is included in Attachment B of this document.

12.0 SPECIFIC ROUTINE PROCEDURES TO ASSESS DATA PRECISION, ACCURACY, AND COMPLETENESS

The laboratory used during this project, TestAmerica, follows all guidelines as required under the SW-846 procedures manual. A copy of the laboratory QA/QC manual is included in Attachment B of this document.

13.0 CORRECTIVE ACTIONS

The laboratory used during this project, TestAmerica, follows all guideline as required under the SW-846 procedures manual. A copy of the laboratory QA/QC manual is included in Attachment B of this document.

Any errors noted by Envirocorp during the data assessment and reduction process will be reviewed with the QC personnel at TestAmerica to determine the nature of the problem, the potential impact of the problem on the accuracy and/or precision of the data, and any other concerns. If it is determined that the data is flawed or outside of the control limits set for this project, it will be discarded and not used as part of the assessment process.

14.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT

The laboratory used during this project, TestAmerica, follows all guidelines as required under the SW-846 procedures manual. A copy of the laboratory QA/QC manual is included in Attachment B of this document. Envirocorp personnel will produce a memo to the senior project manager documenting the level of the quality found in the laboratory and the field methods at the end of the project, or, if necessary, at any time the level of quality has dropped below project specified levels.