PACTIV CORPORATION

MACEDON FILMS SITE
MACEDON, NEW YORK

QUALITY ASSURANCE PROJECT PLAN
MACEDON FILMS SITE
MACEDON, NEW YORK

Site # C859025
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1.0 INTRODUCTION

This *Quality Assurance Project Plan* (*QAPP*) is designed to provide an overview of quality assurance/quality control (QA/QC) procedures and programs which will be adhered to during the investigation and remedial program as described in the Brownfield Cleanup Agreement Number B8-0669-04-06 (BCA) between Pactiv Corporation (Pactiv) and the New York State Department of Environmental Conservation (NYSDEC). The *QAPP* will identify specific methods and QA/QC procedures for chemically testing environmental samples collected from the Macedon Films Site in Macedon, Wayne County, New York (the site). The NYSDEC number for the site is C859025.

2.0 PROJECT/SITE DESCRIPTION

A complete project description of the Macedon Films Site is provided in the *Remedial Investigation Work Plan*, dated September 2, 2004.

3.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

The project organization chart is shown on Figure 1. The URS Project Manager will be responsible for overseeing both the analytical and field QA/QC activities, coordinating the overall project, and maintaining quality throughout the project.

The URS Field Manager is responsible for verifying that QA procedures are followed in the field so that valid, representative samples are collected. This person also will be responsible for coordinating the activities of the URS Field Team, and will be in daily communication with the Project Manager. The Field Manager will verify that all field work is carried out in accordance with the approved project plans.

The URS QA Officer is responsible for verifying that corporate QA procedures are followed. The URS QA Officer (or designee) will be in direct contact with the analytical laboratory to monitor laboratory activities so that holding times and other QA/QC requirements will be met. The analytical laboratory to be used for the analysis of air, soil, and water samples will be certified by the New York certified by State Department of Health Environmental Laboratory Approval Program (ELAP) for the specified analyses. The QA Manager of the laboratory will be responsible for performing project-specific audits and for overseeing the quality control data generated. Also, the Laboratory Project Manager will be in daily communication with the URS QA Officer (or designee).

4.0 DATA QUALITY OBJECTIVES

4.1 BACKGROUND

Data quality objectives (DQOs) are qualitative and quantitative statements, which specify the quality of data required to support the investigation of the site. The project DQOs focus on the identification of the end use of the data to be collected. The project DQOs will be achieved using screening and definitive data categories, as outlined in *Data Quality Objectives Process* for Superfund, Interim Final Guidance, QA/G-4, United States Environmental Protection Agency (USEPA, September 1993). The definitive data are generated using rigorous analytical methods, such as approved USEPA reference methods. The laboratory analytical methods to be used are presented in Table 1.

The project DQOs for data collected during this ongoing investigation are to:

- Evaluate the lateral extent of contamination of volatile organic compounds, semivolatile organic compounds, and metals through the analysis of soil and groundwater samples in the areas surrounding the site.

- Evaluate whether indoor air at the site is impacted by volatile organic compounds.

- Obtain data of sufficient quality and quantity to perform a Feasibility Study to evaluate remedial options for the site.

4.2 QA OBJECTIVES FOR CHEMICAL DATA MEASUREMENT

For the definitive data category described above, the data quality indicators of precision, accuracy, representativeness, comparability, and completeness will be measured during offsite chemical analysis. Samples shipped offsite will be analyzed by a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory.

4.2.1 Precision

Precision examines the distribution of the reported values about their mean. The distribution of reported values refers to how different the individual reported values are from the average reported value. Precision may be affected by the natural variation of the matrix or contamination within that matrix, as well as by errors made in the field and/or laboratory handling procedures. Precision is evaluated using analyses of field duplicates as well as laboratory matrix spike/matrix spike duplicates (MS/MSD) and matrix duplicates (MD), which not only exhibit sampling and analytical precision, but indicate analytical precision through the reproducibility of the analytical results. Relative percent difference (RPD) is used to evaluate precision. RPD criteria are specified in the methods identified in Table 1.

4.2.2 Accuracy

Accuracy measures the analytical bias in a measurement system. Sources of error are the sampling

process, field contamination, preservation, handling, sample matrix, sample preparation, and analysis techniques. Sampling accuracy may be assessed by evaluating the results of rinse and trip blanks. These data help to assess the potential contamination contribution from various outside sources. The laboratory objective for accuracy is to equal or exceed the accuracy demonstrated for the applied analytical methods on samples of the same matrix. The percent recovery (%R) criterion is used to estimate accuracy based on recovery in the MS/MSD, laboratory control sample (LCS), and matrix spike blank (MSB) samples. The MS/MSD, which will give an indication of matrix effects that may be affecting target compounds, are also a good gauge of method efficiency. Recovery criteria are specified in the methods identified in Table 1.

4.2.3 Representativeness

Representativeness expresses the degree to which the sample data accurately and precisely represent the characteristics of a population of samples, parameter variations at a sampling point, or environmental conditions. Representativeness is a qualitative parameter, which is most concerned with the proper design of the sampling program or subsampling of a given sample. Objectives for representativeness are defined for sampling and analysis tasks and are a function of the investigative objectives. The sampling procedures, as described in Section 2.0 of the *Field Sampling Plan* (*FSP*) have been selected with the goal of obtaining representative samples for the media of concern.

4.2.4 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. An objective for this program is to produce data with the greatest possible degree of comparability. This goal is achieved through using standard techniques to collect and analyze representative samples, and reporting analytical results in appropriate units.

Complete field documentation using standardized data collection forms will support the assessment of comparability. Comparability is limited by the other parameters (e.g., precision, accuracy, representativeness, completeness) because only when precision and accuracy are known can data sets be compared with confidence. For data sets to be comparable, it is imperative that the analytical methods and procedures be explicitly followed.

4.2.5 Completeness

Completeness is defined as a measure of the amount of valid data obtainable from a measurement system compared to the amount that was expected to be obtained under normal conditions. To meet project needs, it is important that appropriate QC procedures be maintained to verify that valid data are obtained. For the data generated, a goal of 90% is required for completeness (or usability) of the analytical data. If this goal is not met, then NYSDEC, Pactiv, and URS project personnel will determine whether the deviations may cause the data to be rejected and what, if any, further actions need to be taken.

5.0 SAMPLING LOCATIONS AND PROCEDURES

Sampling locations and procedures are discussed in Section 4.0 of the *Remedial Investigation Work Plan* and in the *FSP* and subsequent work plans submitted and approved by the NYSDEC in accordance with the BCA.

6.0 SAMPLE CUSTODY AND HOLDING TIMES

Proper documentation of sample collection and the methods used to control these documents are referred to as chain-of-custody procedures. Chain-of-custody procedures are essential for presenting sample analytical results as evidence in litigation or at administrative hearings held by regulatory agencies. Chain-of-custody procedures also serve to minimize loss or misidentification of samples and to ensure that unauthorized persons do not tamper with collected samples.

The procedures used in these investigations will follow the chain-of-custody guidelines of National Enforcement Investigations Center (NEIC) *Policies and Procedures*, prepared by the NEIC of the USEPA Office of Enforcement.

6.1 CUSTODY DEFINITIONS

- Chain-of-Custody Officer - The employee responsible for oversight of all chain-of-custody activities is the Field Manager (or his/her designee).

- Under Custody - A sample is "Under Custody" if:

    - It is in one's possession, or
    - It is in one's view, after being in one's possession, or
    - It was in one's possession and one locked it up, or
    - It is in a designated secure area.

6.2 RESPONSIBILITIES

The Field Manager will be responsible for monitoring all chain-of-custody activities and for collecting legally admissible chain-of-custody documentation for the permanent project file. An example chain-of-custody form is included in Appendix A. The URS Field Manager will be responsible for:

- Initially reviewing sample labels or tags, closure tapes, and chain-of-custody record forms. The Field Manager or his/her designee shall document this review for the project file.
- Training all field sampling personnel in the methodologies for carrying out chain-of-custody and the proper use of all chain-of-custody forms and record documents.
- Monitoring the implementation of chain-of-custody procedures.
- Submitting copies of the completed chain-of-custody forms to the Project Manager on a daily basis.

6.3 CHAIN-OF-CUSTODY

Chain-of-custody is initiated in the laboratory when the sample containers are cleaned, packed, and shipped to the site for use in the field. When the containers are received at the site, they will be checked for any breach of chain-of-custody seals or any evidence of tampering.

6.4 SAMPLE CONTAINERS AND HOLDING TIMES

Table 2 identifies the analytical methods, sample container and preservation requirements, and analytical holding times to be used for the samples collected as part of this investigation.

7.0 ANALYTICAL PROCEDURES

Table 1 identifies the specific methods to be performed on each of the sample matrices. All holding times begin with the validated time of sample receipt (VTSR) at the laboratory (except where noted otherwise on Table 2). All analyses will be performed in accordance with the following documents:

- USEPA Office of Solid Waste *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846 (Final Update III, June 1997).

- New York State Department of Environmental Conservation *Analytical Services Protocol*, June 2000 Edition.

- USEPA *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air*, Second Edition, January 1999.

8.0 CALIBRATION PROCEDURES AND FREQUENCY

In order to obtain a high level of precision and accuracy during sample processing and analysis procedures, laboratory instruments must be calibrated properly. Several analytical support areas must be considered so the integrity of standards and reagents is upheld prior to instrument calibration. The following sections describe the analytical support areas and laboratory instrument calibration procedures.

8.1 ANALYTICAL SUPPORT AREAS

Prior to generating quality data, several analytical support areas must be considered:

Standard/Reagent Preparation - Primary reference standards and secondary standard solutions shall be obtained from sources traceable to National Institute of Standards and Technology (NIST), or other reliable commercial sources to verify the highest purity possible. The preparation and maintenance of standards and reagents will be accomplished per the methods referenced in Table 1. All standards and standard solutions are to be formally documented (i.e., in a bound logbook) and should identify the supplier, lot number, purity/concentration, receipt/preparation date, preparer's name, method of preparation, expiration date, and any other pertinent information. All standard solutions shall be validated prior to use. Care shall be exercised in the proper storage and handling of standard solutions (e.g., separating volatile standards from nonvolatile standards). The laboratory shall continually monitor the quality of the standards and reagents through well documented procedures.

Balances - The analytical balances shall be calibrated and maintained in accordance with manufacture specifications. Calibration is conducted with two ASTM Class 1 weights that bracket the expected balance use range. The laboratory shall check the accuracy of the balances daily and properly document results in permanently bound logbooks.

Refrigerators/Freezers - The temperature of the refrigerators and freezers within the laboratory shall be monitored and recorded daily. This will verify that the quality of the standards and reagents is not compromised and the integrity of the analytical samples is upheld. Appropriate acceptance ranges ($4^{o}C \pm 2^{o}C$ for refrigerators) shall be clearly posted on each unit in service.

Water Supply System - The laboratory must maintain a sufficient water supply for all project needs. The grade of the water must be of the highest quality (analyte-free) in order to eliminate false-positives from the analytical results. Ultraviolet cartridges or carbon absorption treatments are recommended for organic analyses and ion-exchange treatment is recommended for inorganic tests. Appropriate documentation of the quality of the water supply system(s) will be performed on a regular basis.

8.2 LABORATORY INSTRUMENTS

Calibration of instruments is required to verify that the analytical system is operating properly and at the sensitivity necessary to meet method established quantitation limits. Each instrument for organic analysis shall be calibrated with standards appropriate to the type of instrument and linear range

established within the analytical method(s). Calibration of laboratory instruments will be performed according to methods specified in Table 1.

Calibration of an instrument must be performed prior to the analysis of any samples (initial calibration) and then at periodic intervals (continuing calibration) during the sample analysis to verify that the instrument is still properly calibrated. If the contract laboratory cannot meet the method-required calibration requirements, corrective action shall be taken as discussed in Section 11.0. All corrective action procedures taken by the contract laboratory are to be documented, summarized within the case narrative, and submitted with the analytical results.

9.0 INTERNAL QUALITY CONTROL CHECKS

Internal QC checks are used to determine if analytical operations at the laboratory are in control, as well as to determine the effect sample matrix may have on data being generated. Two types of internal checks are performed - batch QC and matrix-specific QC procedures. The type and frequency of specific QC samples performed by the laboratory will be determined by the specified analytical method and project specific requirements. Acceptable criteria and/or target ranges for these QC samples are presented within the analytical methods referenced in Table 1.

QC results that vary from acceptable ranges shall result in the implementation of appropriate corrective measures, potential application of qualifiers to the analytical data, and/or an assessment of the impact these corrective measures have on the established data quality objectives. Quality control samples including any project-specific QC will be analyzed are discussed below.

9.1 BATCH QC

Method Blanks - A method blank is defined as laboratory demonstrated analyte-free water, analyte-free solid or humid zero air that is carried through the entire analytical procedure. The method blank is used to determine the level of laboratory background contamination. Method blanks are analyzed at a frequency of one per analytical batch.

Laboratory Control Samples/Matrix Spike Blanks – An LCS or MSB is an analyte-free matrix spiked with all or a representative group of the analytes being analyzed for. The LCS/MSB is a measure of precision and accuracy that is used to verify that the analysis being performed in control. An LCS/MSB will be performed for each matrix.

9.2 MATRIX-SPECIFIC QC

Matrix Spike/Matrix Spike Duplicate Samples - An aliquot of a sample is spiked with known concentrations of specific compounds as stipulated by the methodology. The MS and MSD are subjected to the entire analytical procedure in order to assess both accuracy and precision of the method for the matrix by measuring the percent recovery and relative percent difference of the two spiked samples. The samples are used to assess matrix interference effects on the method, as well as to evaluate instrument performance. For sample batches greater than five, MS/MSDs are analyzed at a frequency of one each per twenty samples per matrix, as listed in Table 1.

Matrix Duplicates - The MD is a second aliquot of a sample, which is prepared and analyzed in a manner identical to that used for the parent sample. Collection of MD samples provides for the evaluation of precision both in the field and at the laboratory by comparing the analytical results of two samples taken from the same location. An MD (for inorganic parameters only) will be performed instead of the MSD. Every effort will be made to obtain replicate samples; however, due to interferences, lack of homogeneity, and the nature of the soil samples, the analytical results are not always reproducible. For sample batches greater than five, MD samples are to be included at a frequency of one per twenty samples per matrix, as listed in Table 1.

Field Duplicates – A field duplicate (FD) sample pair are independent samples, which are collected as close as possible to the same point in space and time. They are two separate samples taken from the same source, stored in separate containers, and analyzed independently. Field duplicates are useful in documenting the precision of the sampling process. Field duplicate samples are to be included at a frequency of one per twenty samples per matrix, as listed in Table 1.

9.3 ADDITIONAL QC

Rinsate (Equipment) Blanks – For soil and groundwater samples, an equipment blank is a sample of laboratory demonstrated analyte-free water passed over and/or through the cleaned sampling equipment. The water must originate from one common source within the laboratory and must be the same water used by the laboratory performing the analysis. For air samples, the equipment blank consists of zero humid air drawn through any equipment used for sample collection (e.g., flow controllers, filters, etc.) after it has been cleaned. An equipment blank is used to indicate potential contamination from sample instruments used to collect and transfer samples. The equipment blanks should be collected, transported, and analyzed in the same manner as the samples acquired that day.

Trip Blanks - Trip blanks are not required for non-aqueous matrices. Trip blanks are required for aqueous sampling events. They consist of a set of sample bottles filled at the laboratory with laboratory demonstrated analyte-free water. These samples then accompany the bottles that are prepared at the laboratory into the field and back to the laboratory, along with the collected samples for analysis. These bottles are never opened in the field. Trip blanks must return to the laboratory with the same set of bottles they accompanied to the field. Trip blanks will be analyzed for volatile organics only. Trip blanks will be analyzed at the frequency stated in Table 1.

10.0 CALCULATION OF DATA QUALITY INDICATORS

10.1 PRECISION

Precision is evaluated using analyses of a field duplicate and/or a laboratory MS/MSD, which not only exhibit sampling precision, but indicate analytical precision through the reproducibility of the analytical results. Relative percent difference (RPD) is used to evaluate precision by the following formula:

$$RPD = \left(\frac{|X_1 - X_2|}{(X_1 + X_2)/2} \right) \times 100\%$$

where:

X_1 = *Measured value of sample or matrix spike*
X_2 = *Measured value of matrix duplicate or matrix spike duplicate*

Precision will be determined through the use of MS/MSD/MD analyses. RPD criteria for this project must meet the requirements of the methods referenced in Table 1.

10.2 ACCURACY

Accuracy is defined as the degree of difference between the measured or calculated value and the true value. The closer the numerical value of the measurement comes to the true value or actual concentration, the more accurate the measurement is. Analytical accuracy is expressed as the percent recovery of a compound or element that has been added to the environmental sample or laboratory demonstrated analyte free-water/solid matrix at known concentrations before analysis. Analytical accuracy may be assessed through the use of known and unknown QC samples and spiked samples. Accuracy will be determined from MS, MSD, MSB, and LCS analyses as well as from surrogate compounds added to organic fractions (i.e., volatile and semivolatile organics), and is calculated as follows:

$$\%R = \left(\frac{X_s - X_n}{K} \right) \times 100\%$$

where:

X_s - Measured value of the spike sample
X_u - Measured value of the unspiked sample
K - Known amount of spike in the sample

10.3 COMPLETENESS

Completeness is calculated on a per matrix basis for the project and is calculated as follows:

$$\%\,Completeness = \frac{N - X_n}{N} \times 100\%$$

where:

X_n - Number of invalid measurements
N - Number of valid measurements expected to be obtained

11.0 CORRECTIVE ACTIONS

Laboratory corrective actions shall be implemented to resolve problems and restore proper functioning to the analytical system when errors, deficiencies, or out-of-control situations exist at the laboratory. Full documentation of the corrective action procedure needed to resolve the problem shall be filed in the project records, and the information summarized in the case narrative. A discussion of the corrective actions to be taken is presented in the following sections.

11.1 INCOMING SAMPLES

Problems noted during sample receipt shall be documented by the laboratory. The URS Project QA Officer (or designee) shall be contacted immediately for problem resolution. All corrective actions shall be documented thoroughly.

11.2 SAMPLE HOLDING TIMES

If any sample extractions and/or analyses exceed method holding time requirements, the URS QA Officer (or designee) shall be notified immediately for problem resolution. All corrective actions shall be documented thoroughly.

11.3 INSTRUMENT CALIBRATION

Sample analysis shall not be allowed until all initial calibrations meet the appropriate requirements. All laboratory instrumentation must be calibrated in accordance with method requirements. If any initial/continuing calibration standards exceed method QC limits, recalibration must be performed, and if necessary, all samples affected back to the previous acceptable calibration check must be reanalyzed.

11.4 REPORTING LIMITS

The laboratory must meet all method-required quantitation limits, which are referenced in the methods listed in Table 1. If difficulties arise in achieving these limits due to a particular sample matrix, the laboratory must notify the URS QA Officer (or designee) for problem resolution. To achieve those quantitation limits, the laboratory must utilize all appropriate cleanup procedures. When any sample requires a secondary dilution due to high levels of target analytes, the laboratory must report all initial and secondary dilution sample results. Dilution will be permitted only to bring target analytes within the linear range of calibration. If samples are analyzed at a dilution with no target analytes detected, the URS QA Officer (or designee) will be immediately notified so that appropriate corrective actions can be initiated.

11.5 METHOD QC

All QC, including blanks, matrix spikes, matrix spike duplicates, matrix duplicates, surrogate recoveries, laboratory control samples, and other method-specified QC samples, shall meet the requirements of the methods referenced in Table 1. Failure of method-required QC will result in the review and possible qualification of all affected data. When the criteria are not met, the affected

sample(s) shall be reanalyzed (when required by the analytical method) within holding times to verify the presence or absence of matrix effects. If matrix effect is confirmed, the corresponding data shall be flagged accordingly using the flagging symbols and criteria as defined by the data validation guidelines identified in Section 12.2. If matrix effect is not confirmed, then the entire batch of samples may have to be reanalyzed at no cost to URS or Pactiv. The URS QA Officer (or designee) shall be notified as soon as possible to discuss possible corrective actions should unusually difficult sample matrices be encountered.

11.6 CALCULATION ERRORS

All analytical results must be reviewed systematically for accuracy prior to submittal. If upon data review, calculation and/or reporting errors exist, the laboratory will be required to reissue the analytical data report with the corrective actions appropriately documented in the laboratory report case narrative.

12.0 DATA REDUCTION, VALIDATION, AND USABILITY

The laboratory will provide NYSDEC ASP Category B deliverable data packages for all sample analyses. The standard NYSDEC Data Package Summary Forms (see Appendix B) will be completed by the analytical laboratory and included in the deliverable data packages.

12.1 DATA REDUCTION

Laboratory analytical data are first generated in raw form at the instrument. These data may be either graphic or printed tabular form. Specific data generation procedures and calculations are found in each of the referenced methods. Analytical results must be reported consistently. Data for aqueous samples will be reported in concentrations of micrograms per liter (µg/L) or milligrams per liter (mg/L). Data for soils will be reported in concentrations of micrograms per kilograms (µg/kg) or milligrams per kilogram (mg/kg) and reported on a dry weight basis. Data for air or soil gas samples will be reported in concentrations of parts-per-billion by volume (ppbv).

Identification of all analytes must be accomplished with an authentic standard of the analyte traceable to NIST or other reliable commercial sources. Data reduction will be performed by individuals experienced with a particular analysis and knowledgeable of requirements.

12.2 DATA VALIDATION

Data validation is a systematic procedure of reviewing a body of data against a set of established criteria to provide a specified level of assurance of validity prior to its intended use.

Data validation will be performed by environmental chemists under the supervision of the URS QA Officer (or designee). All analytical samples collected will receive a limited data review. This review will include a review of holding times; completeness of all required deliverables; review of QC results (surrogates, spikes, blanks) to determine if the data is within the protocol-required limits and specifications; a determination that all samples were analyzed using established and agreed upon analytical protocols; an evaluation of the raw data to confirm the results provided in the data summary sheets; and a review of laboratory data qualifiers. The methods referenced in Table 1 as well as the general guidelines presented in the following USEPA Region II documents will be used to aide the chemist during the data review:

- CLP *Organic Data Review and Preliminary Review*, SOP HW-6, Revision 12, March 2001;
- *Evaluation of Metals Data for the Contract Laboratory Program*, HW-2, Revision XI, January 1992; and
- *Validating Canisters of Volatile Organics in Ambient Air*, SOP HW-18, Revision 0, August 1994
- *Validating Volatile Organic Compounds by SW-846 Method 8260B*, HW-24, Revision 1, June 1999; and

- *Validating Semivolatile Organic Compounds by SW-846 Method 8270*, HW-22, Revision 2, June 2001.

12.3 DATA USABILITY

A *Data Usability Summary Report* (*DUSR*) (NYSDEC, 1999) will be submitted to NYSDEC, and will describe the samples and the analytical parameters. Data deficiencies, analytical protocol deviations, and quality control problems are identified and their effect on the data will be discussed. The DUSR will also include recommendations on resampling/reanalysis.

13.0 PREVENTIVE MAINTENANCE

The laboratory is responsible for maintaining its analytical equipment. Preventive maintenance is provided on a regular basis to minimize down-time and the potential interruption of analytical work. Instruments are maintained in accordance with the manufacturer's recommendations. If instruments require maintenance, only trained laboratory personnel or manufacturer-authorized service specialists are permitted to do the work. Maintenance activities will be documented and kept in permanent logs. These logs will be available for inspection by auditing personnel.

14.0 PERFORMANCE AND SYSTEM AUDITS

Audits are evaluations of both field and laboratory quality control procedures, and are performed before or shortly after systems are operational. Performance audits are conducted by introducing control samples into the data production process. These control samples may include performance evaluation samples, or field samples spiked with known amounts of analytes.

System audits are onsite qualitative inspections and reviews of the quality assurance system used by some part of or the entire measurement system. They provide a qualitative measure of the quality of the data produced by one section or the entire measurement process. The audits are performed against a set of requirements, which may be a quality assurance project plan or work plan, a standard method, or a project statement of work. The primary objective of the systems audits is to verify that the QA/QC procedures are being followed.

14.1 PERFORMANCE AND EXTERNAL AUDITS

In addition to conducting internal reviews and audits, as part of its established quality assurance program, the laboratory is required to take part in regularly-scheduled performance evaluations and laboratory audits from state and federal agencies. They are conducted as part of the certification process and to monitor the laboratory performance. The audits also provide an external quality assurance check of the laboratory, and provide reviews and information on the management systems, personnel, standard operating procedures, and analytical measurement systems. Acceptable performance on evaluation samples and audits is required for certification and accreditation. The laboratory shall use the information provided from these audits to monitor and assess the quality of its performance. Problems detected in these audits shall be reviewed by the Laboratory QA Manager and Laboratory Management, and corrective action shall be instituted as necessary.

14.2 SYSTEMS/INTERNAL AUDITS

As part of its Quality Assurance Program, the Laboratory QA Manager shall conduct periodic checks and audits of the analytical systems. The purpose of these is to verify that the analytical systems are working properly, and that personnel are adhering to established procedures and documenting the required information. These checks and audits also assist in determining or detecting where problems are occurring.

The Laboratory QA Manager periodically will submit laboratory control samples. These samples will serve to check the entire analytical method, the efficiency of the preparation method, and the analytical instrument performance. The results of the control samples are reviewed by the Laboratory QA Manager, who then reports the results to the analyst and the Laboratory Director. When a problem is indicated, the Laboratory QA Manager will assist the analyst and laboratory management in determining the reason and in developing solutions. The Laboratory QA Manager will also recheck the systems as required.

15.0 REFERENCES

Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Quality Assurance Manual, Final Copy, Revision I, October 1989.

National Enforcement Investigations Center of USEPA Office of Enforcement. *NEIC Policies and Procedures.* Washington: USEPA.

New York State Department of Environmental Conservation (NYSDEC). Analytical Services Protocol, June 2000 Edition.

NYSDEC. 1999. Division of Environmental Remediation, *Guidance for the Development of Data Usability Summary Reports.* June.

USEPA. 2001a. *Contract Laboratory Program Organic Data Review, SOP No. HW-6, Revision 12.* USEPA Region II. March.

USEPA, 2001b. *Validating Semivolatile Organic Compounds by SW-846 Method 8270*, HW-22, Revision 2, June 2001.

USEPA, 1999a. *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air*, Second Edition.

USEPA, 1999b. *Validating Volatile Organic Compounds by SW-846 Method 8260B*, HW-24, Revision 1, June 1999; and

USEPA. 1993. *Data Quality Objectives Process for Superfund, Interim Final Guidance*. September. EPA540-R-93-071.

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USEPA. 1987. *A Compendium of Superfund Field Operations Methods*, EPA/540/P-87-001, (OSWER Directive 9355.0-14). December. Cincinnati, OH: USEPA.

USEPA SW-846. *Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods.* Final Update III, June 1997

TABLES

TABLE 1
SUMMARY OF ANALYTICAL PARAMETERS AND QA/QC SAMPLES

PACTIV CORPORATION
MACEDON FILMS SITE
MACEDON, NEW YORK

Analysis	Method[1]	Reporting Limit (ppb)	QA/QC Sample Frequency			
			Field Equipment Blanks	Trip Blanks	Field Duplicates	MS/MSD or MS/MD[2]
Aqueous Samples						
Organic Analyses						
Volatile Organic Compounds	SW-846 Method 8260B	1	1 per 20[3]	1 per day[4]	1 per 20	1 per 20
Semivolatile Organic Compounds	SW-846 Method 8270C	10	1 per 20	--	1 per 20	1 per 20
Inorganic Analyses						
Metals	SW-846 Method 6010B/7470A	per method	1 per 20	--	1 per 20	1 per 20
Solids Samples						
Organic Analyses						
Volatile Organic Compounds	SW-846 Method 8260B	per method	1 per 20	--	1 per 20	1 per 20
Semivolatile Organic Compounds	SW-846 Method 8270C	per method	1 per 20	--	1 per 20	1 per 20
Inorganic/Wet Chemistry Analyses						
Metals	SW-846 Method 6010B/7471A	per method	1 per 20	--	1 per 20	1 per 20
Air Samples						
Volatile Organic Compounds	TO-14A[5]	per method	1 per event	--	1 per 20	--

Notes:

1 - United States Environmental Protection Agency SW-846 Methods from *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*

2 - MS/MSD and MS/MD will be collected when sample batch exceeds five field samples. Lab batch QC will be used to evaluate data usuability for sample batches of five or fewer field samples.

3 - One QA/QC sample (or sample pair) analyzed per twenty field samples or one every two weeks, whichever is more frequent.

4 - One trip blank per sample cooler (aqueous VOC samples only).

5 - USEPA, 1999. *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air* , Second Edition

TABLE 2
ANALYTICAL METHODS, SAMPLE CONTAINERS AND PERSERVATION REQUIREMENTS, AND ANALYTICAL HOLDING TIMES

PACTIV CORPORATION
MACEDON FILMS SITE
MACEDON, NEW YORK

Analysis	Container	Preservation	Holding time
LAB MEASUREMENTS			
Aqueous Samples			
VOCs (EPA Method 8260B)	Three 40 ml septa vials, Glass	HCl to pH < 2, Cool 4 ^{o}C	Analyze within 10 days (7 days if not preserved with HCl)
SVOCs (EPA Method 8270C)	Two 1-Liter Glass	Cool 4 ^{o}C	Extract within five days; analyze within 40 days
Metals (EPA Method 6010B/7470A)	32 oz., Plastic	HNO_3 to pH < 2, Cool 4 ^{o}C	Analyze within 6 months (Mercury - 26 days)
Solid Samples			
VOCs (EPA Method 8260B)	4 oz. Glass jar, Teflon cap	Cool 4 ^{o}C	Analyze within 10 days.
SVOCs (EPA Method 8270C)	1-6oz. Glass jar, Teflon cap	Cool 4 ^{o}C	Extract within 5 days; analyze within 40 days.
Metals (EPA Method 6010B/7471A)	1-6oz. Glass jar, Teflon cap	Cool 4 ^{o}C	Analyze within 6 months (Mercury - 26 days)
Air Samples			
VOCs (EPA Method TO-14A)	6 Liter Summa Canister	--	Analyze within 30 days.

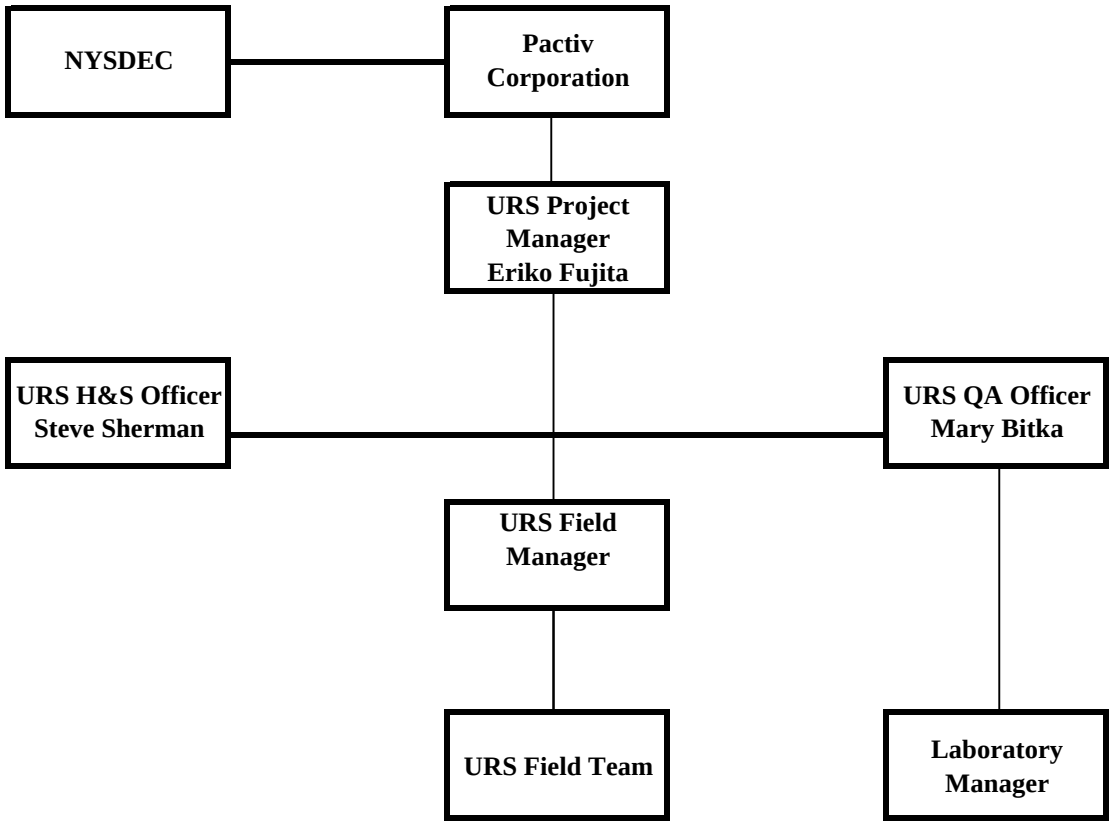
Notes:
VOCs indicates Volatile Organic Compounds
SVOCs indicates Semivolatile organic compounds
Holding times from validated time of sample receipt (VTSR) at the laboratory, except for method TO-14A, which is from time of sample collection.

FIGURES

FIGURE 1

PROJECT ORGANIZATION

PACTIV CORPORATION
MACEDON FILMS SITE
MACEDON, NEW YORK



APPENDIX A

SAMPLE CHAIN-OF-CUSTODY RECORD

SEVERN TRENT SERVICES

STL Newburgh

CHAIN OF CUSTODY

315 Fullerton Avenue
Newburgh, NY 12550
TEL (845) 562-0890
FAX (845) 562-0841

CUSTOMER NAME
ADDRESS
CITY, STATE, ZIP
NAME OF CONTACT PHONE NO.
PROJECT LOCATION
PROJECT NUMBER / PO NO.

REPORT TYPE

STANDARD ☐ ISRA ☐
NJ REG ☐
NYASP A ☐ B ☐ CLP ☐
OTHER _____

TURNAROUND

☐ NORMAL _____
☐ QUICK _____
☐ VERBAL _____

REPORT # (Lab Use Only)

SAMPLE TEMP. _____ C
SAMPLE REC'D ON ICE Y ____ N ____
pH CHECK Y ____ N ____
REVIEWED BY: _____

NY PUBLIC WATER SUPPLIES

SOURCE ID ___ ___ ___
ELRP TYPE ___ ___ ___
FEDERAL ID ___ ___ ___ ___ ___ ___ ___

NOTE: SAMPLE TEMPERATURE UPON RECEIPT MUST BE 4° ± 2°C.

Matrix
DW = DRINKING WATER S = SOIL O = OIL
WW = WASTE WATER SL = SLUDGE GW = GROUND WATER

STL #	SAMPLING DATE	SAMPLING TIME AM PM	COMP	GRAB	MATRIX	CLIENT I.D.	Total Number of Containers	40ml Glass HCL	Liter Amber Sulfuric Acid	Liter Amber Organic Washed	Liter Plastic Nitric Acid	Liter Plastic Sodium Hydroxide	Liter Plastic	Liter Plastic Sulfuric Acid	250ml Plastic	125ml Plastic Sterile	250ml Amber	2 oz. Oorpak	ANALYSIS REQUESTED

JARS USED ONLY

SAMPLES SUBMITTED FOR ANALYSIS WILL BE SUBJECTED TO THE STL TERMS AND CONDITIONS OF SALE (SHORT FORM) UNLESS ALTERNATE TERMS ARE AGREED IN WRITING.

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
SAMPLED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

COMMENTS _____

APPENDIX B

NYSDEC DATA PACKAGE SUMMARY FORMS

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		*VOA GC/MS Method #	*BNA GC/MS Method #	*VOA GC Method #	*Pest PCBs Method #	*Metals	*Other

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
SEMIVOLATILE (BNA)
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
VOLATILE (VOA)
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
PESTICIDE/PCB
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
SEMIVOLATILE (BNA)
ANALYSES

Laboratory Sample ID	Matrix	Analytical Protocol	Extraction Method	Auxiliary Cleanup	Dil/Conc Factor

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
INORGANIC ANALYSES

Laboratory Sample ID	Matrix	Metals Requested	Date Rec'd at Lab	Date Analyzed