APPENDIX 1: COMPLIANCE SCHEDULE

Romic Environmental Technologies Corp. (Romic) and its contractors and consultants have identified certain deficiencies that will take time and resources to address. Romic has developed this proposed schedule to implement construction and other changes necessary to bring the Romic facility into compliance with current requirements. Current requirements include those imposed by law and those described in this permit application.

The Table included in this appendix lists:

- The affected piece of equipment, facility area, or item,
- The indicated compliance action necessary, and
- Potential mitigating measures to be implemented if actions are not completed by the target date.

The items are grouped by target completion date.

Details on indicated actions may be found elsewhere in the main body of this application or in the appended engineering certification documents.

APPENDIX 2

QUALITY ASSURANCE PROGRAM PLAN

ROMIC ENVIRONMENTAL TECHNOLOGIES CORPORATION

2081 Bay Road

East Palo Alto, CA 94303

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CONTENTS

1.0 QUALITY ASSURANCE PROGRAM PLAN

1.1 PROGRAM DESCRIPTION

The Romic Environmental Technologies Corporation (Romic) laboratory is located at Romic's hazardous waste treatment facility in East Palo Alto, California. The objective of the lab's quality assurance program is to ensure that data produced is as accurate (unbiased), precise, complete, and defensible as possible.

The lab is committed to providing the highest quality data to its users in compliance with federal, state, and local regulations. The lab maintains a quality assurance program plan (QAPP) designed to maintain a quality assurance system that ensures all information, data, and resulting decisions compiled under a specific task are technically sound, statistically valid, properly documented, and of measurable quality.

Primary emphasis is placed on presenting information at or near limits of regulatory concern, in keeping with Romic's overall objective of handling hazardous waste and treatment residues. The lab follows standard operating procedures (SOPs) developed using published methods from sources such as EPA SW-846, Standard Methods for the Examination of Water and Wastewater, and Chemical Analysis of Water and Wastes. These SOPs contain corrective action steps for quality control.

The lab's QAPP consists of management policies, data quality objectives, quality assurance (QA) principles, and SOPs. Data is produced in the lab for:

1. testing of incoming waste;
2. waste treatment process control testing;
3. discharge water compliance monitoring;
4. identification of waste unknowns

1.1.1 Program Organization

Quality control (QC) measures are the tools used to monitor the QAPP and ensure the data generated meets program goals. The lab's QA policy is developed by chemists, shift supervisors, and the QA/QC coordinator involved in the specific project. When the QA program and specific QC procedures and standards of performance are completed, the package is reviewed by the QA Officer.

New laboratory employees are trained in proper QA/QC procedures. They are required to review the QAPP and SOPs pertinent to their job duties. A new employee trains with an experienced chemist/analyst; and the new employee must successfully analyze performance evaluation samples before working independently.

The lab begins analysis within holding time limits. Appropriate QC samples are analyzed along with the sample set as specified in SOPs or the QAPP. Analytical results are tabulated, entered into a computer, printed, and checked for transcription errors and against any control limits for the parameter or project by the analyst who performs the work. The printed computer report is subsequently submitted for review by a peer, supervisor, and/or QA Officer who is familiar with the project and the testing methods. This person checks the results for validity and transcription errors, and confirms that QC sample results are within control limits. The report is corrected or the analysis is re-run, as necessary, and the results are initialed and dated by the analyst and the person who performed the QC check.

1.1.2 QC Tracking

The QC tracking system is a multi-phase process. QC samples are analyzed as specified in each analytes SOP. The QC results from all analyses are recorded by analysts in laboratory notebooks. QC results from quantitative analyses are then transferred to analyte-specific forms, formatted for blanks, duplicates, spikes, and standards. The forms are filed in three-ring binders and are grouped in specific combinations of analytes such as metals, ions, or PCBs.

The lab separately tracks results from QC sample analyses on parameter-specific computer spreadsheets. QC records of blanks are maintained in the QC manuals. The control limits from these records are calculated and checked by the analyst and the QA Coordinator. Graphs of the data points and control limits for duplicates, spiked samples and check standards or Certified Reference Materials (CRMs) are updated and printed. These graphs are maintained in the QC manuals. The QA Coordinator meets with analysts performing the tests to discuss any discrepancies from established control limits and help to resolve any problems detected. Control limits are only established in the Laboratory for the certified EPA 601/602 method for volatile organics and when plotting parameters for the NMP/DEG product for the HP, Corvallis site.

QA program documentation is maintained in laboratory notebooks. The lab maintains documentation in computer spreadsheets, notebooks, and on graphs which are updated in analysis-specific QC Manuals (which include records of the preparation and storage of standard solutions) and in the lab's SOPs.

1.1.3 Data Quality Objectives

Data Quality Objectives (DQOs) of varying levels are required for the lab to process quality control, waste characterization, and compliance monitoring samples. Accuracy, precision, completeness, and comparability are facets of data quality. The lab may define DQOs for certain analyses or matrices by charting the results of QC checks over time and developing statistical warning and control limits.

DQOs include:

- **Process Quality Control** for waste consolidation, treatment, and disposal is typically pass-fail analysis without regard to DQOs, except as they confirm data exactly at regulatory limits. Wastes from these processes are complex and may contain compounds at concentrations that interfere with accurate analysis at low regulatory limits.
- **Waste Characterization Analysis** provides accurate and defensible data using federal and state approved methods. Hazardous waste generators employ the lab to help them acquire information about their wastes that will facilitate safe and appropriate treatment and disposal. Analytical data for this purpose must be of the highest possible quality.
- **Wastewater Monitoring for Discharge** to the Palo Alto Sanitary District wastewater collection and treatment systems requires the same level of quality as does waste characterization, but using different analytical methods.

The lab's QA program seeks to estimate and control the bias and imprecision of analytical data and to document sample handling, analytical procedures, data acquisition, report preparation, and data review.

1.2 PERSONNEL

1.2.1 Staff Training

The lab provides its employees with various types of on-going training including OSHA HAZWOPER, hazardous waste handling safety, Department of Transportation (DOT) safety, drug awareness, first-aid and CPR, and MSDS awareness. Agency-certified instructors regularly conduct appropriate classes. The lab further supports continuing education through technical seminars, workshops, trade shows, equipment manufacturer-sponsored classes, and scientific symposia.

Records of training are maintained in compliance with EPA, DOT, and State of California requirements for permitted RCRA treatment, storage, and disposal facilities.

The lab Manager conducts periodic QA training. Training on analytical methods is provided by section supervisors or the lab Manager to:

1. individual analysts when a new method is introduced,
2. newly hired analysts,
3. as needed when procedure problems develop, and
4. as requested by individual analysts.

1.2.2 Position Qualifications

Romic position applications are closely scrutinized and evaluated to confirm qualifications. Qualifications include education, experience, on-the-job training, and demonstrated laboratory skills. The lab endeavors to achieve near 100% cross-training to ensure available qualified personnel. Advanced training in instrumentation and analytical methodology is made available. Education may substitute for experience in some cases.

The lab’s minimum qualifications for key positions are presented below.

LABORATORY MANAGER

Education	A bachelor’s degree in chemistry or an applied science with 4 years experience.
Experience	Seven years combined experience in environmental/analytical and hazardous waste management laboratories, with at least a minimum of 1 year in each.

SHIFT SUPERVISOR

Education	A bachelor’s degree in chemistry or an applied science, or equivalent training and experience.
Experience	Five years combined experience in environmental analytical and/or hazardous waste laboratories. Up to 3 years experience in another type of chemical laboratory may be substituted.

CHEMIST

Education	An associate degree in chemistry or an applied science, or equivalent training and experience.
Experience	Zero to 2 years experience in environmental analytical and/or hazardous waste management laboratories.

QA/QC COORDINATOR

Education	An associate degree in chemistry or an applied science, or equivalent training and experience.
Experience	Zero to 2 years experience in environmental analytical and/or hazardous waste management laboratories.

TECHNICIAN

Education	High School Diploma
Experience	One year chemical laboratory experience.

1. The technician must perform analyses under the guidance of a qualified analyst for a period of 1 week to 2 months (depending on the analysis and the aptitude of the individual).
2. Demonstrate the skills and abilities necessary to perform quality work (by successfully analyzing blind quality control samples) before being allowed to perform the analysis without guidance.
3. Any analyst performing a new procedure must do so under the guidance of a qualified analyst until considered proficient. Courses offered by qualified training facilities should be taken to supplement in-house training as necessary.

1.3 FACILITIES, EQUIPMENT AND SERVICES

1.3.1 Gas Cylinder Storage

Gas cylinders are stored in gas storage rooms with separate oxidizer and flammable storage compartments. The gases are piped to the benches through welded, leak-checked, "oxygen-ready" pipes which are made of a material inert to the gases used. Gas cylinders not stored in gas storage rooms are located in the immediate vicinity of instruments. All cylinders are strapped or chained to a solid, stable frame. Gases are of appropriate purity for the application and changed when empty or when they reach a level below which contamination is suspected. Natural gas lines and lines from air compressors and vacuum pumps are piped to all locations where needed.

1.3.2 Water Locations

Hot and cold water and a deionized water spigot or dispensing containers are located as necessary at all sinks on bench tops and at cup sinks in hoods. Filters and tanks are changed as necessary on the deionized water system (indicated by in-line resistance signal lights.) Water connections or separate water coolers are provided for instrument cooling systems. Safety showers and eye wash stations are conveniently located and tested periodically as specified in the chemical hygiene plan (CHP).

1.3.3 Work Space Safety Measures

The electrical requirements of all instruments and equipment are provided for at the instrument/equipment locations. Surge suppressers and/or dedicated electrical lines are provided as necessary for sensitive microprocessor controlled instruments, computers, and integrators. Adequate bench top and/or floor space is allowed for each piece of equipment in the laboratory design.

Adequate lighting is provided for all storage, hood, desk, bench top, and other work areas.

Ventilation is provided around all instruments requiring it. Analyses where vapors can be released are performed in hoods with ample ventilation designed specifically for these purposes. Hoods and vents operate 24 hours a day and spare belts are kept on hand for rapid repair.

In addition to safety showers and eye wash stations, fire extinguishers of either the halon or dry chemical type are located conveniently throughout the lab and in each hood where natural gas is used.

Lighted or fluorescent exit signs are posted above doors. Adequate flammable solvent, acid, and alkaline storage areas are provided. In the sample storage rooms, samples are segregated by hazard class and stored on shelves equipped with restraining bars. Samples are housed on these shelves until packaged for disposal.

1.3.4 Equipment

New equipment is selected after extensive cost and productivity evaluation and hands-on testing (when possible) to determine the best unit for analytical requirements.

The equipment and instruments used in the lab include:

- labware
- heaters, mixers, desiccators
- vacuum pumps, air compressors
- refrigerators
- hot plates and gas burners
- magnetic stirring systems
- ovens
- calculators, recorders, integrators, computers

- analytical balances
- pH/selective ion meters
- ICPAE, AA, FTIR and UVs spectrophotometers
- ion and gas chromatographs
- mercury analyzer system
- oxygen bomb calorimeters
- Karl-Fisher moisture determination instruments
- pilot distillation columns
- flash point tester
- midi cyanide distillation system
- liquid-liquid extraction system
- liquid-solid extraction system
- digital and analog viscometers

A current inventory of equipment and instrumentation is provided in the Appendices.

1.3.5 Preventative Maintenance

Preventive maintenance is performed by analysts. Maintenance includes replacing minor parts and routine cleaning. Service and repair records are maintained for each instrument.

Instrument performance is monitored by daily calibration, sensitivity, and response checks. Results of these checks give information about the need for non-scheduled maintenance. Laboratory support systems (e.g. water deionizing units, refrigerators, and ovens) are also monitored and serviced regularly.

The lab maintains a limited inventory of spare parts and supplies so minor repairs can be made quickly and analytical instruments brought back on line with a minimal of down time.

1.3.6 Waste Disposal

The lab will manage all waste generated in accordance with all local, state, and federal regulations. Adequate procedures have been established to prevent the improper management of waste materials.

1.4 DATA DETAIL

The following procedures were developed to ensure the generation of reliable data. The use of QAPPs and SOPs ensures complete, representative, and comparable data of measurable precision and accuracy.

1.4.1 Standard Operating Procedures

The lab's goal of generating reliable analytical data of known quality is facilitated by adhering to the SOPs of the QAPP in the following areas.

1. Analytical Methods

An SOP Manual is maintained in the lab. This manual contains the analytical specifications and includes for each method:

1. Analytical procedure
2. Glassware
3. Standards, reagents and solvents
4. Equipment
5. Analytical measurements
6. Sample handling and preservation
7. Quality control requirements
8. Reference for the method

Analytical methodologies are usually based on

- USEPA Manual of Methods for Chemical Analysis of Water and Waste,
- Standard Methods for Examination of Water and Wastewater, and
- EPA Test Methods for Evaluating Solid Waste, SW-846.

Some unique matrices require special treatment. Minor modifications to a method from one of these sources is documented in the SOPs. A few analyses are not based on codified methods. Romic develops SOPs for these methods; these are included as Appendix D to this plan.

2. Glassware

The measurement of trace constituents in environmental and waste samples demands minimum interference. This is especially true for trace metals and organics. Cleanliness of the glassware and use of the volumetric ware is a very important part of the QA/QC program.

The method of cleaning is appropriate for both the substances that are to be removed and the analysis to be performed. Water soluble substances are washed with hot or cold water and the glassware is given a final rinse with Type II water. Other contaminants may require the use of one or more of the following: detergent, organic solvent, sulfuric acid -- dichromate cleaning solution, or some mineral acid. The glassware is rinsed after cleaning with successive amounts of tap water followed by Type II water. (The analyst is cautioned that when chromium is included in the list of analytes for a sample, it is imperative that the last trace of dichromate be removed from the glassware. Any glassware used for trace metals analysis is soaked in a solution of dilute nitric acid. In all cases the glassware is rinsed with tap water as soon after use as possible to prevent material from drying on it. Specific analyses require glassware be either heated in a 130 degree

Celcius oven, acid-rinsed, or solvent-rinsed prior to use. The lab uses disposable labware where appropriate.

3. Standards, Reagents, and Solvents

Solutions and standards are prepared according to procedural specifications from analytical grade reagents, solvents, and/or chemicals and Type II water. As required for trace analyses, special grades of reagents are used to reduce background interference, ensure the integrity of the analytical method and instrumentation, and maintain the integrity of the analytical method and instrumentation.

Analysts properly store reagents and solvents to prevent contamination and deterioration. Standards, reagents, and solvents are stored according to the manufacturer's specifications or per analytical requirements. Reagents or solvents that are sensitive to light are stored in dark bottles in a cool, dark place.

Some solutions require refrigeration or other preservation. Solutions are dated when prepared. All solutions for use on the bench are labeled with composition and preservation. Shelf life information for each reagent is available in SOP(s).

Absorbents for thin-layer and column chromatography are stored in the original containers or per the requirements of individual methods.

Analysts pay particular attention to the stability of standards and reagents. Standards are not kept longer than recommended by the manufacturer or the method. The concentration of standards may change as a result of evaporation or chemical/bacterial deterioration. Working standards are frequently checked to determine changes in concentration or composition. When new stock solutions are necessary, dilution of the old and new standard are compared to determine accuracy.

Appropriate contaminant-scrubbing filters are used on gas lines as necessary and are replaced before they are depleted, according to usage time limits or indicator color. All gases, reagents, and chemicals are stored compatibly and safely as regulated by OSHA, DOT, and NFPA.

4. Equipment

Each instrument operator is responsible for the routine maintenance of his or her instrument. All instruments are kept at optimum operating conditions and checked daily (or with each use) for performance criteria. Instruments not meeting requirements are not used until they are returned to acceptable operating conditions. This may require re-tuning, column replacement, pre-column replacement, injector or source cleaning, burner head cleaning, lamp replacement, pump seal replacement, or column repacking. Other corrective steps may be required before the instrument is considered operational.

Copies of the specified limits of instrument performance or the appropriate reference manuals are kept with each instrument for easy reference by operators. Personnel responsible for the operation and maintenance of any instrument are required to know performance criteria, recognize deficiencies, and clearly demonstrate their ability to correct deficiencies.

Some pieces of ancillary equipment are relatively simple and do not require a maintenance record. These units are monitored for their performance capacities during daily usage. Malfunctioning equipment is replaced or repaired as necessary. This group of equipment includes heaters, mixers, desiccators, water baths, vacuum pumps, air compressors, calculators, recorders, printers, and integrators. This group of equipment requires some maintenance which is not recorded. Indicating desiccant is replaced when exhausted and the desiccator seal integrity is monitored. Water levels and temperature are monitored in water baths. Vacuum pump oil levels are kept at appropriate levels and filters are cleaned as needed. Batteries are replaced in calculators and paper and ink/ribbon/printer heads are replaced in recorders, printers, and integrators as required.

Other equipment requiring minimal but recordable monitoring includes refrigerators, ovens, computers, pH meters, and analytical balances. Computers used for instrument control are monitored for available memory, down loaded, and backed up as necessary to floppy disks or tapes which are then stored. Reporting computers are backed up weekly on tape which is stored in a fire safe area. pH meters are calibrated daily and calibration records are kept in a log book next to the instrument.

The more complicated instruments require more thorough record keeping. Copies of the instrument manufacturers operating and maintenance manuals are readily accessible to the instrument operators. The QC manuals for this equipment include maintenance and service records, standard preparation logs, and QC sample results. These are filed for laboratory personnel use. Calibration and performance records are also maintained.

5. Analytical Measurements

The lab's QA program includes control procedures for the following analytical measurement techniques:

a) ***Direct Quantitation*** When quantitation is performed gravimetrically, spiked samples and duplicates are run periodically to assure quality. Titrants used in titrimetric analyses are standardized against solutions of known concentration as required. Standards are run periodically to monitor the titrant concentration.

b) ***Quantitation Using Standard Curves*** A new standard curve is established with each new batch of reagents or periodically, when QC sample results indicate problems. The curve should have at least three points and cover the necessary concentration range. Samples are quantitated from the linear portion of a curve or from within the data points in a linear least squares regression. This may require sample dilution. Calibration verification standards are analyzed every 10 samples to ensure that the calibration curve is valid.

c) ***Quality Control Checks*** In general, at least 10 percent of quality control (QC) samples are run with an analytical batch. QC samples are analyzed as specified in the "Analysis Specific Quality Control Requirements" table located in the Appendices. A quality control sample is defined as a:

- reagent blank,
- check standard or Certified Reference Material (CRM),
- matrix spike, or
- matrix duplicate.

In general, check standard analysis should fall within 20 percent of the actual value and spiked sample analyses should fall within 50 percent of actual value. Duplicate analyses should also agree within 25 percent. These control limits may vary, depending on the analysis. Deviations from these limits are specified in the QC Manuals and the SOPs. In the laboratory, percent recovery, standard deviation, and relative percent difference are calculated from the QC data on computer spreadsheets and tabulated or graphed results are kept in the QC manuals.

Note: Reagent blanks, check standards, matrix spike and matrix duplicates are only performed when running the EPA 601/602 certified method for volatile organics in waste water.

6. Sample Handling and Preservation

The objective of sampling is to collect a portion of material small enough in volume to be transported conveniently and handled in the laboratory while still accurately representing the material being sampled. Documentation for field sampling includes specific sample identification, analysis requested, date, initials of the individual performing the sampling and methods of preservation. This information is recorded on the sample labels.

Sample preservation includes pH control and chemical addition and/or refrigeration. Sample preservation is detailed in the Appendices. Samples requiring refrigeration are placed in a refrigerator upon receipt unless the analysis can be started immediately. Analysts are notified as soon as samples are received, so rush sample analyses can be accommodated. Samples analyzed in the laboratory are held in the sample storage area for labpacking by DOT hazard class and ultimate disposal through one of Romic's facilities. Sample storage and labpack / disposal are detailed in SOPs.

Wastewater samples requiring GC/MS analysis are transferred to cold storage outside the door to the GC/MS labs and GC/MS chemists are notified immediately. Water samples in unopened vials are held in the VOA refrigerator for 10 days before disposal . Other samples are held in the sample storage area before disposal.

1.4.2 Data Processing

Upon receipt, samples are logged into the laboratory in a laboratory log book where sample tracking information is recorded. Each sample is given a unique lab number (also recorded on any paperwork and in the log book). All samples are submitted with the generator and transporter information. The form accompanying the sample is kept with the sample or in a pending work file, and is eventually filed with the sample paperwork. Samples without sufficient or complete paperwork are retained until the paperwork is completed. Samples suspected of containing pathogenic, radioactive, or explosive materials are rejected until such time as their contents can be proven by the generator to be free of such materials.

Data, calculations, analytical observations, and results are recorded in laboratory notebooks or on sample analysis tracking forms (which are filed with reports). All pages/data entries are dated and initialed. Initialing is not necessary if the record is made in an analyst's personal notebook (which is labeled and numbered by volume).

Data reduction is performed and recorded in the notebooks or on the data sheets. Reduction is accomplished manually using calculators or computer spreadsheets, or using instrument microprocessors which contain and reference standard curves to process data.

An analyst's familiarity with the analysis serves as a check on microprocessor controlled calculations. In chromatography, constant review of chromatograms makes the analyst aware of computer errors caused by retention time shifts or faulty integration. Experienced spectrophotometer operators know what absorbances to expect for certain standards and what concentrations to expect for certain absorbance readings. With UV/Visible spectrophotometric determinations, even the degree of color of the solution acts as a flag if it does not produce the expected absorbance measurement.

In using the computerized laboratory reporting program, reports are generated directly from notebooks or sample analysis tracking forms. For some analyses, data is transferred from the notebook to data forms for data entry into the computer system. These transfers are carefully reviewed by the analyst for accuracy before submitting them for report generation. Computer generated reports are printed after computer input of data into the appropriate report format. These are reviewed for accuracy by the analyst. The reports are then forwarded to another analyst who understands the analytical procedures used. That analyst reviews the report for overall validity and transcription errors. The report (or corrected report) is then initialed and dated before being released. Upon generator request a copy of the report and any backup information is given to the generator and the original is kept on file by generator facility name in the Waste tracking office.

1.4.3 Data Quality Assessment and Corrective Action

Quality control data is recorded in notebooks. QC data is compared to EPA published control limits if established, otherwise they use the limits specified in the SOPs.

The lab records QC data on computer spreadsheets by analysis parameter for quantitative analyses. Control limits and other statistical analyses are developed from these records. The control limits are used in assessing the accuracy and imprecision of a sample set and the comparability of that sample set to others. Prior to generating internal control limits, the lab uses EPA published control limits if established, otherwise they used the limits specified in the QC Checks. In some cases, EPA published control limits are utilized regardless of in-house values. For example, only EPA published control limits are used if a client requests this in the QAPP for a specific project. Internally-generated control limits may be less restrictive than EPA control limits. This could occur when a majority of the data used is from actual waste samples. Matrix effects in waste samples are typically much more pronounced than in the water samples used in establishing EPA control limits.

The lab internally-generated control limits, charts, and tables for certified methods are printed monthly, when feasible and reviewed by the QA Officer or the Laboratory manager to monitor QA. During the QA Officer's review, any deviations from the generated limits are examined for cause and problems are identified and solved. An evaluation of the corrective action taken and its effect is made before additional analyses are performed.

When a control limit has been exceeded and the problem cannot be readily solved, the analyst must notify their supervisor or the QA Officer immediately. Possible causes are researched with the help of the QA Officer and other chemists, and corrective action is taken, documented, and kept on file for review. Other forms of data assessment and corrective action are project-specific and are detailed in the appropriate QAPPs.

1.4.4 Data Reduction, Validation, and Reporting

Upon customer request the lab communicates test results to clients (in-house and through sales staff) by publication of an analytical report that is accompanied by project-specific supporting documentation. The analytical reports and supporting data represent the end product of the laboratory. The following procedures are used in the preparation and publication of each report.

A. Data Reduction

Most data produced in the laboratory is generated using dedicated instrumentation with microcomputer interfaces. These PC-based systems receive signals from the analytical instrument to which the sample or extract was submitted. This computer system processes the raw signal into a quantitative value.

An experienced analyst reviews this data, verifies identifications and double checks quantitations and final values. The analyst then submits a copy of the data and calculations for secondary review. Secondary review consists of checks on procedure, calculations, and completeness.

Some instruments are configured to operate without computers. For these instruments, the information is recorded on a strip chart or numerical printout or read from a digital display or analog dial. In such cases, the analyst must reduce the data to a reportable format, multiplying the original signal by a calibration factor or comparing it with a standard curve. Blank correction may be required. The aliquot result must be divided by the mass or volume of the sample to produce a concentration-based final result. Simple programs are used for some calculations; most are carried out on hand-held scientific calculators. All data is recorded and placed in the project file.

Some laboratory tests, such as titrations or sensory evaluations, do not use instruments. For these, the analyst records the quantitative result or observation directly onto worksheets. The same calculations as previously described may also be needed; if so, the calculations are recorded in the analyst's notes and submitted for secondary review.

For all methods of data reduction, the final analytical value is recorded on a worksheet by the analyst or downloaded by computer into the project file (subsequent to secondary review). Ancillary information, such as analyst initials, date, project number, and analytical methods are recorded in the project file. These files are compiled by sample coordination staff into report packages.

B. Data Validation

Each analyst reviews his or her own work for consistency and compliance with quality criteria for the specific methods. Section supervisors review all report packages with checks on procedure, calculations, and completeness. The laboratory manager, shift Labortory supervisor or the QA/QC

Coordinator reviews the report package for completeness. Reports for characterization or confirmation of incoming wastes are given a final review by technical operations staff for application to treatment and disposal processes.

C. Reporting

Reports are printed, filed, and stored .

1.5 SAMPLING PROCEDURES

To assure proper selection of sample containers and application of appropriate preservatives, the lab refers to EPA guidelines in 40 CFR 136. The lab makes this information available to its users as requested.

Samples for monitoring discharge permit compliance are collected onsite and brought to the laboratory by lab processing personnel, who collect these samples in accordance with discharge permit conditions.

1.6 ANALYTICAL

1.6.1 Procedures

Methods used by the lab are prescribed by the EPA:

Standard Methods for the Examination of Water and Wastewater; 16th, 17th, and 18th Editions; APHA-AWWA-WPCF (WEF), 1985, 1989, 1993.

Methods for the Chemical Analysis of Water and Wastes, EPA-600/4-79-020, (40 CFR 136.) Revised March 1983.

Test Methods for Evaluating Solid Waste, USEPA SW-846, Third Edition, November 1986 and Third Edition Proposed Update Packages, December 1987, and November 1990.

Additional methods for various sample types are taken from sources such as the National Institute of Occupational Safety and Health (NIOSH), the American Society for Testing Materials (ASTM), and the Association of Official Analytical Chemists (AOAC).

All analyses pursuant to RCRA employ methods from SW-846. Wastewater discharge under the Clean Water Act requires methods from 40 CFR 136 or EPA's *Methods for the Chemical Analysis of Water and Wastes.*

1.6.2 Corrective Action and Control Limits

Analytical control limits are maintained for laboratory certified methods on control samples (LCSs), method blanks, and matrix spike recoveries. Acceptance criteria are based EPA established data and method specifications.

If any of the aforementioned control parameters do not meet acceptance criteria, the analyst initiates corrective action. Corrective action might include recalibration, review of data, or re-analysis of a batch.

Systematic failure of a method, persistent contamination that the analyst cannot resolve, quality control issues raised in audit reports, or quality control failures that impact data already reported are dealt with by formal corrective action. The laboratory manager facilitates resolution of such issues.

Steps toward corrective action include:

1. Identification and definition of the problem,
2. Assignment of responsibility for investigating the problem,
3. Investigation and determination of the cause of the problem,
4. Determination of the corrective action necessary to eliminate the problem,
5. Assignment of responsibility for implementing the corrective action,
6. Implementing the corrective action and evaluating its effectiveness, and
7. Verifying that the corrective action has eliminated the problem.

The laboratory manager is responsible for ensuring that these steps are taken and that the quality problem has been resolved.

1.7 CALIBRATION PROCEDURES AND FREQUENCY

Chemicals used by the lab in instrument calibration and analysis are ACS reagent-grade or better. Chemical standards used in analytical work and quality control are prepared in-house from reagent-grade materials or purchased as standard concentrates from chemical suppliers.

Instruments are calibrated at regular intervals as specified by analytical SOP and as required by published methodology.

The initial calibration of the ICP (for metals by inductively coupled plasma spectroscopy) is performed by preparing a three-point calibration curve (including S0 -- blank) for each element to be analyzed. Each curve must have a correlation coefficient of 0.995 or greater. S0 must be less than the method detection limit. Individual standard agreement with the curve is checked to verify that it is ±10 percent of the nominal value. The curve (linear regression applied) is verified with a secondary source material (initial calibration verification).

Each day that samples are analyzed, a midpoint standard is run to verify the accuracy of the calibration curve. This midpoint standard must fall within five to ten percent of its true value when compared to the calibration curve. . The apparent concentration of this standard must fall within five to ten percent of the true concentration.

Standards are prepared daily by diluting mixed-element concentrates, which are prepared from commercially available solutions. The ICP is recalibrated daily or every shift if needed.

The accuracy of gravimetric analyses (FOG) is heavily dependent on the accuracy of the analytical balance used. The lab assures the accuracy of its balances by ensuring that each analytical balance is calibrated annually or semiannually if needed by an independent contractor.

1.8 QUALITY CONTROL PROCEDURES

1.8.1 Routine

Reported data must be validated by measurements of bias, imprecision and completeness. The following discussions detail the lab's methods of assessing these parameters.

A. **Imprecision.** Imprecision is the lack of agreement or repeatability of a set of replicate results among themselves or the agreement among repeated observations made under the same conditions. Once the imprecision of a method is determined, the analyst can establish control limits on subsequent individual duplicate pairs. The warning limit is set at $\pm 2s$ and the control limit is set at $\pm 3s$.

B. **Bias.** Bias (systematic and random error) is a measure of the difference due to systematic error between an analytical result and the true value for that analyte.

   Some sources of systematic errors include:

   - sample collection
   - physical/chemical instability of samples
   - interference effects
   - inability to measure all forms of a determinand
   - calibration of the measurement system
   - contamination

   Some of these sources of error are beyond the control of the laboratory.

   Control limits (using Shewhart control charts) are established for each analyte at three standard deviations, and warning limits at two standard deviations. Each batch LCS is compared to the control charts to determine if the batch is "in control". Control charts are also used to observe trends.

C. **Completeness.** The percentage of data generated that falls within established control limits is defined as completeness. Completeness is dependent upon 1) representativeness of sampling and subsampling, 2) appropriate method selection, and 3) the ultimate purpose and use of the data. Completeness factors that are within control of the laboratory are in-lab sample storage, in-lab holding-time compliance, and compliance with quality control parameters.

1.9 CHECKS

Internal quality control check samples are designed to evaluate the effectiveness of the QA/QC system and to help detect the presence of problems within the system. The following types of check samples are used by the lab to ensure quality control.

A. **Method Blanks.** Method blanks consist of organic-free water, sand, or deionized water carried through the analytical scheme like a sample. One method blank is analyzed at least once a day.

B. **Calibration Blanks.** Calibration blanks are prepared with standards and are used to create a calibration curve. They contain no analyte and provide the intercept for the calibration curve.

C. **Spikes.** Spikes are analytical samples to which a known quantity of analyte has been added. They are used to assess the influence of matrix on instrumental response. Recovery of spiked analyte may be used to measure accuracy of a determination. Stock solutions used for spiking are purchased or prepared independently of calibration standards. Prepared and analyzed in each batch of samples, spikes are subjected to the same preparation/extraction procedure and analysis.

D. **Duplicates.** Duplicates are repeated preparation and analysis of the same sample. When the concentration of analyte in duplicate pairs is consistently below the detection limit, duplicate spikes are substituted for duplicates. Duplicates are prepared and analyzed in the first sewer batch tank on a daily basis.

E. **Laboratory Control Samples.** Laboratory control samples (LCS) are aliquots of organic-free water, sand (or similar material), or deionized water to which known amounts of an analyte have been added. They are subjected to the same preparation/extraction procedures and analyses as samples. Stock solutions used for LCSs are purchased or prepared independently of calibration standards. LCS recovery measures the performance of the analytical methodology employed.

APPENDICES

APPENDIX A
GLOSSARY OF QUALITY ASSURANCE/ QUALITY CONTROL TERMS

Accuracy The degree of agreement of an analytical result with the true value. The accuracy of a result is affected by both systematic and random errors. Some writers improperly use accuracy to denote only systematic error. (See "bias".)

Action Limit A type of control limit which is specified by a value on a control chart. If the value is exceeded, then corrective action must be taken. Action limits are usually placed at ± 3 standard deviations from the expected or mean value.

Analyte Denotes 'that which is to be analyzed for' in chemical, but not physical or biological determinations.

Analytical Error The error, E, of an analytical result, R, is defined as:

$$E = R - T$$

where T is the true value.

Analytical Method Denotes a set of written instructions specifying an analytical procedure to be followed by an analyst to obtain a numerical estimate of the concentration of a determinand (analyte) in each of one or more samples.

Analytical Response A numerical observation which is obtained when a portion of a sample is presented to a measurement sub-system (e.g., spectrophotometric measurement of the absorbance of a solution). The magnitude is related to the amount or concentration of the determinand (analyte) in that portion.

Analytical Result Denotes a numerical estimate of the concentration of a determinand (analyte) in a sample, and is obtained by once carrying out the procedure specified in an analytical method. Note that a method may specify analysis of more than one portion of a sample to produce one analytical result. The result can also be thought of as the final value reported to the user.

Analytical System Denotes a combination of analyst, analytical method, equipment, reagents, standards, laboratory facilities, any other components involved in carrying out an analytical procedure.

Batch Batch usually refers to a set of consecutive determinations (analyses) made without interruption. The results are usually calculated from the same calibration curve or factor. Also called a run.

Bias The inaccuracy of an analytical result caused by systematic error.

Blank A determination which is intended to estimate the analytical response attributable to all factors other than the determinand (analyte) in the sample. Blanks are analyzed identically to samples, but do not contain the determinand (analyte) (e.g., in water analyses, a pure water would be analyzed to determine the blank). Some writers use the term method blank with the same meaning given here for blank.

Calibration Standard(s) Solution(s) of known concentration which are used in the calibration (standardization) procedure to determine the relationship between response and concentration.

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

Check Standard A solution of known concentration which is used to check the precision of analyses (and bias due to calibration). When used in conjunction with a control chart, it becomes a control standard.

Control Limit A value specified on a control chart which is used to make decisions as to whether the results or control tests are acceptable. Two kinds of control limits are usually specified: warning limits and action limits.

Criterion of Detection The smallest concentration which can be distinguished from a blank with no more than a 5% chance of reporting a false positive.

Data Quality Objectives (DQOs) Qualitative and quantitative statements of the quality of data needed to support specific decisions or regulatory actions.

Degrees of Freedom A whole number expressing the amount of information available for a particular estimate; it is generally the number of independent results less the number of constraints (constraints being what else has to be estimated from the same set of results).

Determinand	Denotes 'that which is to be determined.' Covers chemical, physical, biological, or other analytical determinations.
External Standard Calibration	The use of independently prepared standards to determine the relationship between response and concentration. They are run separately from the sample(s). Also called external standardization.
Interference	A systematic error (bias) in the analytical result caused by the presence of a substance in the sample (or added to the sample during analysis).
Internal Standardization	A calibration procedure in which the responses of analytes are determined relative to internal standard(s) which is (are) added to every sample. Two solutions -- calibration and spiking -- are required. Used to reduce bias due to calibration.
Isotope dilution	A type of internal standardization procedure in which the internal standards are isotopically labeled analogs of the analytes. Isotope dilution techniques are characterized by very low bias due to calibration.
Limit of Detection (or Detection Limit)	The smallest concentration for which there is at least a 95% chance that it will be detected as a positive (i.e., there is only a 5% chance of obtaining a false negative).
Percent Recovery	That percent of a known amount of material "spiked" or added to a sample being analyzed which is recovered at the end of analysis. See "spike" and "recovery". $$\%\ \text{Recovery} = 100\frac{(R_2 - R_1)}{A}$$ where R2 and R1 are the results for the sample (without the spike) and the spiked sample, respectively, and A is the equivalent concentration added in the spiked sample.
Population	The collection of all possible analytical results.
Precision	A qualitative term used to denote the scatter of results. Precision is said to improve as the scatter among results becomes smaller. Also referred to as imprecision. Usually measured as standard deviation.

Quality Assurance The total integrated program for assuring the reliability of monitoring and measurement data.

(Analytical) Quality Control The routine application of statistically-based procedures to evaluate and control the accuracy of results from analytical measurements.

Random Error Indicated when repeated analyses of identical portions of a homogeneous sample does not give a series of identical results. The results differ among themselves and are more or less scattered about some value. They are termed random because the sign and magnitude of the error of any particular result vary at random, and cannot be predicted exactly.

(Analytical) Recovery An estimate, usually expressed in percent, of an analytical result in comparison with a true or reference value for the analyte, (e.g., an analytical recovery of 95% for compound X means that the result was 95 percent of the true or reference value for X in the sample). It is a direct indication of analytical performance.

(Physical) Recovery An estimate, usually expressed in percent of the amount of standard or analyte present at the final stage of analysis (e.g., final extract), compared with the amount present in the original sample. It can be an indirect indication of analytical performance.

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

Relative Standard Deviation (RSD) The standard deviation relative to the mean. Also called 'coefficient of variation'. It is calculated as either $\frac{s}{x}$ or $100\frac{s}{x}$. The latter is sometimes referred to as percent relative standard deviation or % RSD

Spike The addition of known amount of analyte to a sample for the purpose of judging, from the analytical percent recovery, whether there is bias due to interference present in the sample. Also referred to as fortification of the sample. See "percent recovery".

Standard A solution of known concentration. There are two types of standards: 1) check (or control), and 2) calibration.

Standard Operating Procedure (SOP)

A detailed, written description of a procedure designed to systematize the performance of a procedure.

Standard Deviation

A constant which describes the width of the normal distribution of results. An actual standard deviation is denoted by "s" whereas an estimate of the standard deviation is denoted by "s". For a sample of "n" replicate results taken from a population for analyses of a sample of known concentration, the estimate of the standard deviation is:

$$s = \sqrt{\frac{\sum_{i=1}^{n}\left(x_i - \bar{x}\right)^2}{n-1}} = \sqrt{\frac{\sum_{i=1}^{n} x_i^2 - \frac{\left(\sum_{i=1}^{n} x_i\right)^2}{n}}{n-1}}$$

where "x" is a result and "$\bar{x}$" is the mean of "n" results.

For duplicate analyses of "m" pairs of unknown samples, the estimate of the standard deviation of the difference (d) for the two samples in each pair is:

$$s = \sqrt{\frac{\sum_{i=1}^{m} d_i^{\,2} - \frac{\left(\sum_{i=1}^{m} d_i\right)^2}{m}}{m-1}}$$

For duplicate analyses of "m" pairs of unknown samples, the estimate of the standard deviation of the difference (d) for the two samples in each pair is:

$$s = \sqrt{\frac{\sum_{i=1}^{m} d_i^{\,2} - \frac{\left(\sum_{i=1}^{m} d_i\right)^2}{m}}{m-1}}$$

For spike recoveries on "n" samples, the estimate of the standard deviation of the percent recovery (p) is:

$$s = \sqrt{\frac{\sum_{i=1}^{n} p_i^{\,2} - \frac{\left(\sum_{i=1}^{n} p_i\right)^2}{n}}{n-1}}$$

Standard Reference Materials (SRM) A sample of known concentration, also called a certified reference material, issued by the National Institute for Standards and Technology (NIST)

Statistical Sample The results of one or more determinations taken from the population of all possible results.

Statistics Certain single values computed from the results, which characterize certain properties of the results. Each statistic has its own frequency distribution which is defined by a particular mathematical function. Examples of statistics are the mean ($\overline{x}$), estimate of the standard deviation (s), and the frequently-used t- and F- statistics.

Surrogate Standard A type of check standard, which is added to every sample in a known amount at the start of processing. The surrogate is not one of the target compounds for the analysis, but should have analytical properties similar to those compounds. The surrogate compounds are not expected to be present in environmental samples.

Systematic Errors Errors which are indicated by a tendency of results to be greater or smaller than the true value. Usually bias can be considered to be equivalent to systematic error.

Target Compound A compound which is expected to be in an environmental sample or for which the analysis is being conducted.

Warning Limit A type of control limit which is specified by a value on a control chart, usually $\pm 2s$ distant from the expected or mean value. Action is required when results fall outside the warning limits too frequently. A single value outside a warning limit does not require action, but should alert one to a possible problem.

APPENDIX B
MAJOR INSTRUMENTATION

CURRENT INSTRUMENT / EQUIPMENT LISTING

1. Air Compressors
2. VWR Scientific Ph/Temp Meter-Model 8000
3. Tekmar Aquatek 70 – Liquid Vial Autosampler
4. Tekmar 3100 – Purge and Trap Concentrator
5. Hach COD Reactor (2 Instruments)
6. Corning Ph/Ion Analyzer 350
7. Hewlett Packard Laser Jet 4 printers (3 printers)
8. Data Plate, Digital Hot Plate-PMC 732 series
9. Brookefield Digital Viscometer-DV-III Model (programmable Rheo Meter)
10. VWR Scientific Refrigerated Recirculator.
11. Continuos liquid-liquid extraction system
12. Sartor Research Analytical instrument
13. Hewlett –Packard 5890 II series Gas Chromatography; ELCD and PID detectors; HP Chemstation Data software system. The workstation functions in instrument control and data acquisition modes as well as data reduction and report generation modes.
14. Leeman labs, Inc. PS 200II Automated Mercury Analyzer
15. Nicolet Avatar 360 FT-IR Esp Spectrophotometer
16. Dionix Automated Sampler
17. Dionix Advanced Computer Interface
18. Dionix 4000I series-Advanced Chromatography Module (Ion-Chromatography) 2 Instruments
19. Dionix SRS Controller
20. Cetac Membrane Desolvator
21. Cetac U-6000 AT* Ultra Sonic Nebulizer
22. Cetac ASX-500 Autosampler Tray
23. Thermo Jarrel Ash Enviro I ICAP Spectrometer
24. Fisher Scientific A-250 Analytical balance XD-4KD model
25. Becton Dickinson Compact II Centrifuge
26. Parr 1262 Bomb Calorimeter

27. Mono Bloc inside AB 204-S Analytical Balance
28. Em Science Aquastar V-200 Titrator
29. Hewlett-Packard 5890 II series Gas Chromatograph; Dual TCD Detectors; Hewlett Packard 7673 Autosampler with dual towers; dual packed injectors, 7673 Controller Module; HP chemstation Software Data system (2 Instruments)
30. Hewlett-Packard 5890 II series Gas Chromatograph; Dual Flame Ionization Detectors; 7673 Autosampler tower with dual towers,7673 Controller Module, Split/Splitless dual injectors; HP Chemstation Software Data System
31. Grieve Laboratory Oven
32. Coleman-Model 50 B Mercury Analyzer System
33. Hach DR/2000 Direct reading Spectrophotometer (2 Instruments)
34. Mettler-Toledo, AG204 Analytical Balance
35. Hewlett-Packard 5890 II series Gas Chromatograph; Dual TCD Detectors, Dual Splitless Injectors, 7673 Autosampler tray with dual towers, 7673 Controller; HP Chemstation Software Data System .
36. Hewlett-Packard 5890 II series Gas Chromatograph; Dual Electron Captured Detectors; 7673 Autosampler tray with dual towers, 7673 Controller Module,

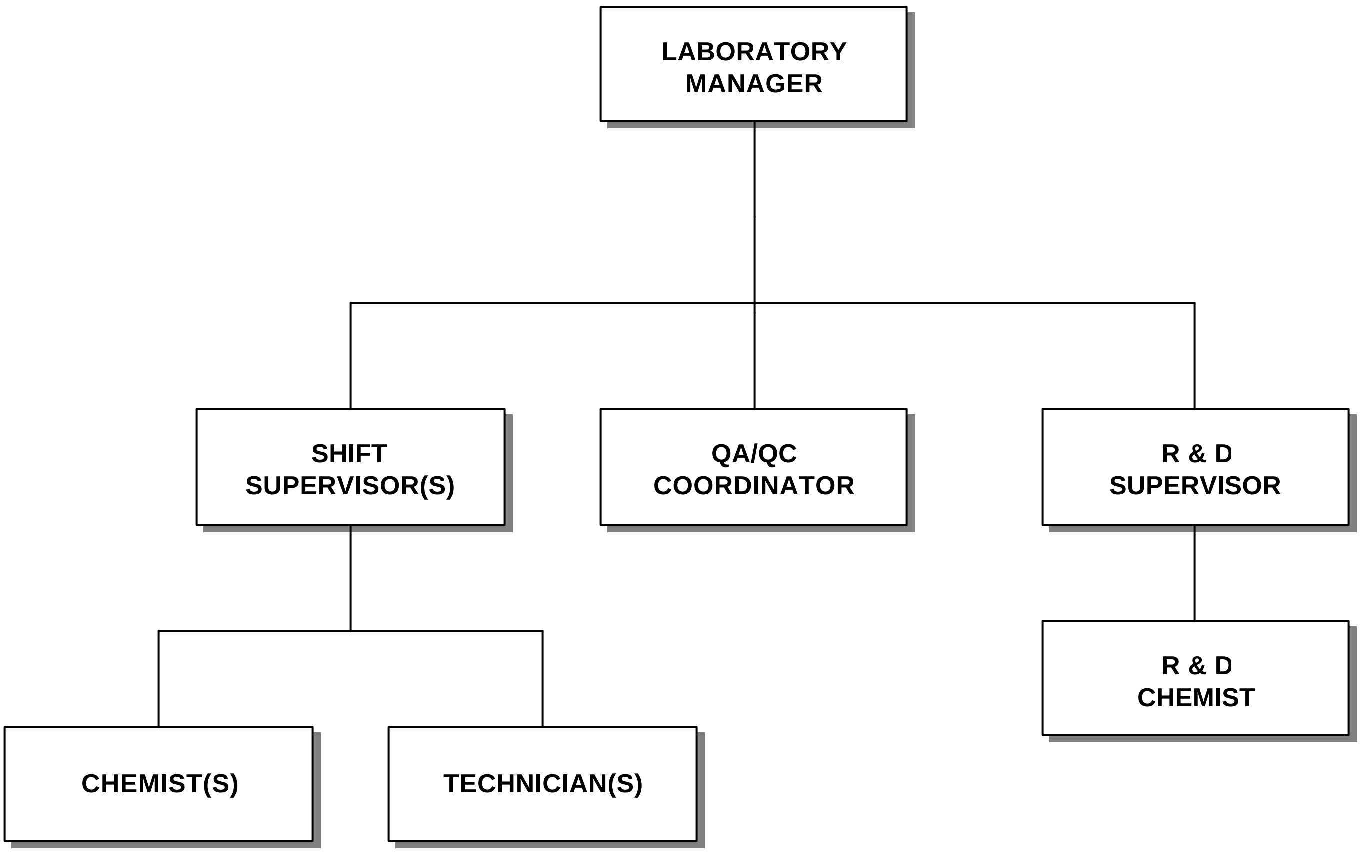
    HP Chemstation Software Data System.
37. Hewlett-Packard 5890 II series Gas Chromatograph; Dual Electron Captured

    Detectors, 7673A Autosampler Tray with dual towers, 7673A Controller Module;

    HP Chemstation Software Data System
38. Brookefield Analog Viscometer-Model LVF
39. Hall Detector-Tracor 1000
40. O.I. Corp. Lamp power Supply 4430
41. Hewlett Packard 5890 II series GC/5970 MSD including HP 59822 B Ionization Gauge Controller, 7673 Autosampler Tray with single tower, split/splitless capillary inlet and vent flow control,Vacuum pump; HP MS Chemstation Software Data System.

APPENDIX C
LABORATORY ORGANIZATION

ROMIC ENVIRONMENTAL TECHNOLOGIES



APPENDIX D
ROMIC METHODS

Title: Radiation screening method Lab SOP-007
Effected Date: 11/23/98
Revision: 1 Department: Laboratory

1. APPLICABILITY, SCOPE, AND PURPOSE:

This Procedure is designed to screen for radiation in hazardous waste samples. This method offers to the user the ability to screen waste for radiation in a quick and efficient manner. Any positive result will be reported to your supervisor or manager immediately

2. SUMMARY OF METHOD

The detector probe of the Eberline SRM 100 is placed within one inch of the surface of the sample for at minimum of five seconds .The instrument responds to alpha, beta, and gamma radiation. If the background is above 100 counts per minute the alarm will sound and the screen is determined positive. Any positive result must be reported to your supervisor immediately.

3. TRAINING

3.1 40 HOUR HAZWOPER TRAINING

3.2 ROMIC WAP TRAINING

4. PROCEDURE

4.1.Make sure the radiation meter is on. The meter has a battery power source in case of power failure. The meter is preset for an alarm to sound at 100 counts per minute.

4.2.Remove the cap from the sample container. Place the detector probe within one inch of the surface of the sample for a minimum of five seconds.

4.3.If no alarm sounds the screen is considered negative.

4.4. An alternate approach is to pour at least 5 grams of sample into a weighing dish. Place the detector probe within one inch of the sample for at least five seconds.

5. QUALITY CONTROL

Exposing a sample of Cesium 137 to the meter will suffice for a daily quality control check. The alarm should sound during this exposure. This result will be recorded in the Quality Control logbook for the instrument. If the QC check fails immediately notify the supervisor or manager on duty.

6. MAINTENANCE AND CALIBRATION

The mater will be sent out yearly to be calibrated and the certification label will be attached to the instrument.

Title: Iodometric Method for Analysis of Dissolved Sulfides LAB SOP-008
AWWA Std Methods 18th edition 4500-SE

Revision Number: 1 Department: Laboratory

1. **Scope and application**

This standard operating procedure is to be used for the analysis and quantification of dissolved sulfides. This SOP will provide guidance for the laboratory personnel in handling samples, which consist of or contain sulfides.

2. **Summary of Method**

Per Lab-SOP-03 all samples should be screened for sulfides using lead acetate paper. Any sample that results in a positive sulfides test result should be further analyzed to deter-mine the quantity of sulfides present. If a positive sulfide screen is observed the sample will be further analyzed by IC with CYN-4000 method for quantitative sulfide results (Lab-SOP-25). The IC method can only determine the concentration of free sulfides and therefore different forms of sulfides may go undetected. Samples that result in a sulfide concentration of more than 1 0-ppm will not be accepted at Romic (Table 3.4, Romic WAP). The standard Iodometric method for determining dissolved sulfides will be used for samples that result in a positive sulfide screen but show less than 10-ppm concentration by IC.

3. **Required Training**

3.1 24 Hour Hazardous Waste Operations and Emergency Response Training

3.2 Waste Analysis Plan Training

3.3 Romic Waste Acceptance Guidance Training

3.4 Lab-SOP-03

3.5 Lab-SOP-25

4. **Apparatus and materials**

4.1 5 N HCI solution

4.2 0.025 N Iodine solution

4.3 0.025 Sodium thiosulfate solution

4.4 Starch solution indicator

4.5 100 ppm sulfide standard (Dissolve 187.5 mL of Na2S.9H20 in 25OmL of DI water. Add 1-2 mL 5 N NAOH to achieve a pH of 12).

4.6 25 mL glass burette

4.7 Lead Acetate Paper

4.8 Dionex 300 IC unit/4000I

5. Procedure

Pipette 20 mL of 0.025 N 12 solution into a 125 mL Erlenmeyer flask. Add 2 mL of 5 N HCI to acidify, then pipette 50 mL of sample and transfer under the liquid surface into the flask to minimize loss of H2S. The maximum amount of sulfide that 20 mL Of I2 solution can oxidize is 160 **jig.** The optimum range for sulfide to be titrated would be 20-1 00 [tg. For samples with unknown sulfide concentration, use iodine color as guidance. If upon sample transfer the brown color of iodine disappears, keep adding iodine until a medium brown color persists. If this requires more than 50 mL of iodine then the sample should be diluted prior to titration. Start the titration by adding Na2S203 dropwise until the color of iodine mixture lightens significantly which indicates that the most of the iodine has been consumed Na2S203- Once the mixture becomes slightly brown in color add 0.5 mL of starch solution as indicator. Titrate the now blue solution until the end point is reached which is observed by the change in color from blue to clear.

Calculate the sulfide concentration by using the following Formula;

$$S^{2-} \text{mg/L} = \frac{(V_{iodine} \times N_{iodine} - V_{sodium\ thiosulfate} \times N_{sodium\ thiosulfate}) \times 16,000}{\text{mL Sample}}$$

V = Volume
N = Normality

6. Quality Control

A minimum of one blank and one QC will be analyzed per sample batch. A sulfide standard of I 00-ppm (see 4.5 for standard preparation) will be used for the QC sample. The QC and blank will be analyzed using the above procedure

Title: Screening test for Apparent Chlorine LAB-SOP-072

Effective Date:10/15/02

Revision Number: 1.0 Department: Laboratory

1. Scope and Application

This standard operating procedure is designed and intended as a qualitative screening test to establish whether a liquid sample contains chlorine. This test method does not quantify the amount of chlorine in the sample, however it does indicate small, medium or large amounts.

2. Training

2.1 40 HOUR HAZWOPER TRAINING
2.2 WAP TRAINING

3. Apparatus

3.1 Bunsen burner
3.2 6-12 inch glass rod
3.3 A thick copper wire suspended above the burner with one end looped and centered in the flame
3.4 Fume hood

4. Procedure

4.1 Place the sample container inside the fume hood. Open it at a safe distance from the flame.

4.2 Dip the glass rod in the sample and immediately place the glass rod in the open flame below the copper wire. If no green or blue color is observed in the flame, then the sample contains no chlorine. A green color in the flame indicates the presence of chlorine. The size of the green flame is proportional to the amount of chlorine. At higher percentages, the flame becomes blue.

5. Corrective Action

Failure to follow this procedure as written will subject the affected individuals to disciplinary action up to and including termination.

TABLE
ROMIC COMPLIANCE SCHEDULE ITEMS

EQUIPMENT/AREA/ITEM	ACTION NECESSARY	MITIGATION[1]
Prior to Permit Finalization[2]		
Vac Pot 24	Install new concrete footing on top of the existing footing; stiffen and add new base plates to legs.	
Vac Pot 25	Install new concrete footing on top of the existing footing; stiffen and add new base plates to legs.	
T-24 and T-25 (receivers for Vac Pots)	Add stiffeners to enhance ability to withstand vacuum.	
Reboiler 35	Modify legs and attach anchor lugs; add concrete to existing foundation.	
Tanks NT-1, NT-2,and NT-3	Weld base plate to foundation for seismic stability.	
Tanks 101, 102, 103, and 104	Complete seismic upgrades (tank anchoring and foundation retrofit).	
Tanks R-91–R-95	Strengthen frame, install new anchor bolts, add concrete to existing foundations	
Tank Farm J	Treat concrete with concrete sealer.	
Tank Farm Q	Treat concrete with concrete sealer.	
To Be Completed Within Six Months[3] of Permit Issuance		
High Temperature Unit	Secondary containment increase and seismic work; retrofit for vacuum service	
Liquefaction Product Tank (Tank PT-1)	Reinforce tank against lateral forces by coupling tank to adjoining steel frame	
Tanks AES-1, AES-2, AES-3, and AES-4	Complete anchorage and foundation upgrades on stainless steel tanks AES-1 through AES-4.	Determine acceptable liquid level for continued use of tanks
Tanks 16–20	Install diagonal bracing on tank legs for Tanks 16, 17, 19, and 20; pour additional concrete for footing of Tank 18, install new anchor lugs	
Tank 21	Strengthen support legs, install new anchor bolts, add concrete to existing foundation	

Table Footnotes:

[1] Mitigating measures to be put in place if completion of necessary actions is delayed beyond indicated completion date.
[2] Given in time from effective date of final permit.
[3] Romic will request or has requested authorization, either through Temporary Authorization or class 1 permit modification, to implement these improvements.

TABLE
ROMIC COMPLIANCE SCHEDULE ITEMS

EQUIPMENT/AREA/ITEM	ACTION NECESSARY	MITIGATION[1]
To Be Completed Within Nine Months [2] of Permit Issuance		
Caustic Reboiler	Reinforce support legs and anchor bolts, and pour additional concrete for foundation	
Stainless Steel Kettle	Install additional leg bracing and pour additional concrete for foundation/footings; reinforce for vacuum service	
To Be Completed Within Twelve Months [2] of Permit Issuance		
Tanks 2, 3, 5, 6, 7, 9, 10, and 11	Complete anchorage upgrades on stainless steel tanks in Tank Farm A.	Determine acceptable liquid level for continued use of tanks
Tanks 26, 27, 28, 29, 30, and 31	Complete anchorage upgrades on stainless steel tanks in Tank Farm H.	Determine acceptable liquid level for continued use of tanks
Tanks 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, and 43	Complete anchorage upgrades on stainless steel tanks in Tank Farm MNO.	Determine acceptable liquid level for continued use of tanks
Tanks 44, 45, 46, and 47	Complete anchorage upgrades on 8800 gallon stainless steel tanks in Tank Farm L.	Determine acceptable liquid level for continued use of tanks
To Be Completed Within Fifteen Months [2] of Permit Issuance		
Tanks 48, 49, and 50	Add four anchor lugs to each of the four legs of each tank, secure to foundation using 1" bolts; add concrete to footings.	Determine acceptable liquid level for continued use of tanks
Biological Wastewater Treatment System tanks	T-13, B-2: Test anchor bolt assemblies, install new anchor bolt assemblies if necessary. B-3, B-3A: Install sixteen new anchor lugs and install new concrete ring. B-5: Test anchor bolt assemblies, install new anchor bolt assemblies if necessary, pour additional concrete around existing pedestal footing. B-6, B-6A: Test anchors and install 8-16 new anchor lugs; install new concrete ring	

Table Footnotes:

[1] Mitigating measures to be put in place if completion of necessary actions is delayed beyond indicated completion date.
[2] Given in time from effective date of final permit.
[3] Romic will request or has requested authorization, either through Temporary Authorization or class 1 permit modification, to implement these improvements.

TABLE
ROMIC COMPLIANCE SCHEDULE ITEMS

EQUIPMENT/AREA/ITEM	ACTION NECESSARY	MITIGATION[1]
	B-7: Test anchor bolt assemblies, install new anchor bolt assemblies if necessary, pour additional concrete around existing pedestal footing. SF-1, SF-2: Test anchors or install support at rim flange.	
To Be Completed Within Eighteen Months[2] of Permit Issuance		
Tanks 4, 8, and 12	Pour additional concrete over existing footing.	
Tanks K, L, and M	Reinforce cross-bracing by welding channel to upper supports	
Reboiler 49	Install new reinforced concrete foundation on top of the existing reinforced concrete foundation; install eight new anchor lugs; test anchor bolts on eight existing anchor lugs, and replace if necessary.	
Tank 1	Seismic upgrades	
To Be Completed Within 21 Months[2] of Permit Issuance		
Enhanced Secondary Containment, Truck Parking	Construct the enhanced secondary containment areas for staging of unmonitored trucks.	Place absorbent boom around unmonitored loaded trucks.
Drum Pumping Area	Construct the Drum Pumping Area for staging of containerized waste to be bulked.	Place absorbent boom around drums staged for pumping, unless in other permitted storage area.
To Be Completed Within 24 Months[2] of Permit Issuance		
Truck Loading/Unloading Bay (Area A)	Increase containment capacity in truck unloading bay between Tank Farm C and Tank Farm MNO.	Place absorbent boom across front of bay when unmonitored loaded truck is staged
Truck Loading/Unloading Bay (Area B)	Increase containment capacity in truck unloading bay between Tank Farm B and Tank Farm C.	Place absorbent boom across front of bay when unmonitored loaded truck is staged
Tank Farm Q	Raise walls above 100-yr flood level (8' amsl)	
Tank Farm C/existing Tank Farm R	Combine containment area for current Tank Farm R with Tank Farm C.	
Production Area	Increase containment capacity.	

Table Footnotes:

[1] Mitigating measures to be put in place if completion of necessary actions is delayed beyond indicated completion date.
[2] Given in time from effective date of final permit.
[3] Romic will request or has requested authorization, either through Temporary Authorization or class 1 permit modification, to implement these improvements.

TABLE
ROMIC COMPLIANCE SCHEDULE ITEMS

EQUIPMENT/AREA/ITEM	ACTION NECESSARY	MITIGATION[1]
Tank Farm G	Increase containment capacity.	
General Plant areas	Repair concrete, replace asphalt portions with concrete.	Evaluate areas posing risk, modify operations to avoid exposure to areas needing repair/replacement
Tank Farm A	Treat concrete with concrete sealer.	
Tank Farm B	Treat concrete with concrete sealer.	
Tank Farm CLR	Treat concrete with concrete sealer.	
Tank Farm G	Treat concrete with concrete sealer.	
Tank Farm H	Treat concrete with concrete sealer.	
Tank Farm I	Treat concrete with concrete sealer.	
Tank Farm K	Treat concrete with concrete sealer.	
Tank Farm MNO	Treat concrete with concrete sealer.	
West Storage Building #1	Increase containment capacity to meet UFC requirements.	

Table Footnotes:

[1] Mitigating measures to be put in place if completion of necessary actions is delayed beyond indicated completion date.
[2] Given in time from effective date of final permit.
[3] Romic will request or has requested authorization, either through Temporary Authorization or class 1 permit modification, to implement these improvements.

Romic Environmental Technologies Corp.

CAD 009 452 657

East Palo Alto, California
TSD Facility

Appendix 3

Closure Plan

November 2001

Rev. 4/05

TABLE OF CONTENTS

Tables and Attachments are presented in separate sections following the main body of the text.

TABLES

ATTACHMENTS

APPENDIX 3 - CLOSURE PLAN AND CLOSURE COST ESTIMATES

1 CLOSURE PLAN

22 CCR 66270.14(b)(13), 66264.112

This Closure Plan describes the procedures Romic Environmental Technologies Corp. (Romic) will follow to close the existing and planned hazardous waste management units at the East Palo Alto facility. Closure activities will be performed in accordance with 22 CCR 66264 Article 7. The closure requirements for waste piles, surface impoundments, land treatment, landfills, or incinerators do not apply to Romic's East Palo Alto Facility.

The Closure Plan has been prepared to describe procedures that Romic will use when hazardous waste activities cease to occur at this location. In accordance with regulatory guidance, however, Romic prepared the closure cost estimate assuming that closure will be performed by an independent third party. This Closure Plan further assumes that all applicable Corrective Action requirements have been satisfied before the initiation of closure activities.

1.1 Facility Description

<u>Facility Identification</u>
Romic Environmental Technologies Corp. (Romic)
East Palo Alto Facility
2081 Bay Road
East Palo Alto, CA 94303-1316

Telephone: 650-324-1638

EPA/State Identification Number: CAD 009 452 657

The East Palo Alto facility receives a broad range of hazardous wastes for treatment and disposal management. Various treatment and disposal options utilized at the facility include:

Solvent Recycling: The distillation of used thinners and solvents (e.g., lacquer thinner, methanol, acetone, mineral spirits) to achieve a reclaimed solvent product of specified purity for resale/reuse.

Ethylene Glycol Recycling: The distillation of used ethylene glycol (e.g., antifreeze) to achieve a useable product for resale/reuse.

Fuel Blending: The mixing of impure waste materials of a sufficiently high heat content to produce a consistent alternative fuel for use in off-site cement kilns.

Liquefaction: Blending of solid and semi-solid materials with liquid material (e.g., diesel fuel, waste solvent) to achieve a liquid consistency for use in the fuel blending process (see above).

Wastewater Treatment: Treatment of onsite or off-site wastewaters that are contaminated with organic and inorganic contaminants. Various aqueous treatment techniques are used including distillation processes, biological treatment, filtering and ultra-violet oxidation to meet local sewer agency discharge limits.

Neutralization: Adjustment of caustic and acidic wastes to achieve a neutral pH. Neutralized waste streams may undergo secondary industrial wastewater treatment to remove organic contaminants.

***Inorganic Treatment**: Treatment of inorganic wastes using methods including: neutralization/pH adjustment, chemical precipitation, oxidation/reduction, de-watering, filtration, and stabilization. Note – planned activities are shown in italicized text throughout this Closure Plan. These items have not been installed yet and are included in the November 2001 permit application awaiting approval.*

***Solids Consolidation:** Sorting and homogenizing containers of solid hazardous waste to remove liquids and non-uniform solid debris (e.g., sharps) prior to consolidating materials with similar hazard characteristics into a uniform, bulk waste stream for off-site transfer and disposal.*

***Debris Shredding**: Processing contaminated solid materials through an industrial shredder to facilitate transportation for off-site disposal.*

"Off-Site" Transfer: Waste shipped off-site for treatment/disposal without on-site treatment.

MISCELLANEOUS MANAGEMENT PROCESSES

Consolidation of Small Containers: Field service technicians package and/or receive small quantity chemicals (e.g., outdated chemicals, lab packs) packaged in DOT-approved containers by hazard class for sorting and treatment using one or more of the above processes.

***Aerosol Depressurization**: Puncturing of commercial aerosol containers to remove flammable propellant and contents. Propellant is released to an air emission control unit. The hazardous material is collected and transferred to the fuel blending operation.*

***Drum Crush:** Crushing of nearly empty and empty drums. Residue removed from nearly empty drums is treated on-site, as appropriate.*

***Truck Wash:** Washout of tanker trucks. Rinse water is treated in the onsite Aqueous Treatment system, or neutralization system, as appropriate.*

The facility's waste management units and corresponding capacities are listed in Section 1.5, Maximum Waste Inventory. Hazardous waste management units and operations are discussed in detail in Sections D and E of the Part B Application. Figure D-1, Facility Layout, is the site map of the existing and planned facilities and identifies areas discussed in the Closure Plan and Closure Cost Estimates.

1.2 Closure Performance Standards

22 CCR 66264.111

Closure activities at the Romic facility are designed to meet general federal and state closure performance standards. The closure activities will:

- Minimize the need for further maintenance;
- Control, minimize, or eliminate to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground, surface water, groundwater, or atmosphere; and
- Ensure that any equipment, structures, or buildings left in place on site contain no hazardous waste or hazardous waste constituents.

Generally, these standards will be met by:

1. Removing or processing all regulated waste present at the facility at the time of closure, and

2. Decontaminating all contaminated equipment, containment system components, structures, and soils to meet specified closure performance standards, or

3. Removing from the site all contaminated equipment, containment system components, structures, soils, and equipment. These waste materials will be properly characterized to determine if they are hazardous wastes in accordance with 22 CCR 66262.11 and 22 CCR 66261.3(e) and will be sent to an appropriate disposal, treatment, or recycling facility.

All mobile or fixed equipment that has been used to process or handle hazardous wastes will be cleaned, decontaminated, and re-used, salvaged, or, if necessary, disposed off site at an appropriately-permitted facility as described in paragraphs 2 and 3 above.

Specific closure performance standards that will be used to determine if equipment, structures, or media meet the general performance standards described above are listed below.

1. **Metal Tanks –** Attainment of the closure performance standard for metal tanks will be based on wipe samples showing inorganic constituents of concern below levels which will be agreed upon with the Department of Toxic Substances Control (DTSC) prior to start of closure. The closure performance standard for organic compounds will be non-detect based on the test methods specified in the referenced Sampling and Analysis Plan.

2. **Plastic Tanks –** No performance standards will be established for such tanks. They will be removed and managed appropriately as hazardous or non-hazardous waste, depending on waste analysis testing. If the plastic tanks were used to manage a RCRA listed hazardous waste, the tanks shall be assumed to be hazardous, but they may be tested to determine if they meet land disposal restriction (LDR) requirements.

3. **Lined Containment Areas** – Attainment of the closure performance standard for lined containment areas in good condition (no cracks, gaps, or deterioration of the liner through to the concrete) will be based on wipe samples showing inorganic constituents below levels which will be agreed upon with the DTSC prior to start of closure. The closure performance standard for organic compounds will be non-detect based on the test methods specified in the referenced Sampling and Analysis Plan.

4. **Unlined Containment Areas** – This will apply to unlined containment areas or to containment areas with liners that have deteriorated or have had identified deficiencies at some point during their use. A risk-based clean-up standard will be developed at time of closure, using current toxicological protocols and data at that time. A cost for preparation is included in the closure cost estimate.

5. **Soils** – A risk-based clean-up standard will be developed at time of closure, using current toxicological protocols and data at that time. A cost for preparation is included in the closure cost estimate.

6. **Small Miscellaneous Pieces of Equipment –** The used rinse water from cleaning small pieces of equipment will be compared to the fresh (unused) rinse water to verify if the equipment item has been decontaminated. The allowable increase above that used for cleaning will be based on the EPA Region 9 Preliminary Remediation Goals for tap water.

An independent professional engineer registered in California, or their agent, will monitor all closure activities to ensure they are conducted in accordance with the approved Closure Plan. Closure activities to be monitored by the independent engineer, or their agent, include tank system decontamination, secondary containment decontamination, and soil sampling and analysis. The certifying engineer, or their agent, will visit the facility at least weekly. These inspections will be part of the facility's operating record.

1.3 Estimated Date of Closure

There are no current circumstances that would indicate the need to close the Facility. However, for the purposes of this Closure Plan, the Facility will be assumed to operate for another 25 years. The Facility may remain in service past this date as economic and regulatory factors allow.

1.4 Amendment of Closure Plan

22 CCR 66264.112(c)

The Closure Plan may require amendment during the course of the facility's life, or in some post-closure contingencies. The facility will amend the Closure Plan upon any of the following:

- Changes in operating plans or facility design affecting the Closure Plan (such as the construction of new units),
- Change in anticipated year of closure,
- Unexpected events arising during partial or final closure that affect the Closure Plan,
- Changes in regulations that affect facility closure, or

- Request of the Department.

If any of the first four of the above events arises, Romic will submit to DTSC a request to modify the Closure Plan. In the case of planned changes, Romic will request the Closure Plan modification at least sixty days prior to any anticipated change. Romic will request a Closure Plan modification within sixty days after any unanticipated event, effective date of regulatory change, or Department request, unless the Department request occurs during partial or final closure. If a Department request occurs during closure, Romic will submit a modification request within thirty days of the Department's request.

Post-Closure Applicability

Although Romic will not generally be subject to post-closure requirements, these requirements may become applicable upon any of the following contingencies:

- Groundwater contamination due to a release from regulated units is confirmed at the time of closure,
- Romic departs from the "clean closure" scenario (i.e., non-attainment of the closure performance standards, especially the risk-based clean-up standards).

1.5 Maximum Waste Inventory

22 CCR 66264.112(b)(3), 66270.14(b)(13)

The maximum waste inventory includes all hazardous waste management units shown in the Part B Permit Application. For purposes of the Closure Cost Estimate, two bases are used. The Base Case Facility is all existing storage tanks and process units as of November 9, 2001 plus the Solids Consolidation, Debris Shredding, and Truck Washing operations. The remaining units proposed in the Part B Permit Application are identified separately. The summary of unit capacities and maximum waste inventory bases for each closure cost category are summarized in the table below. The maximum waste inventory volume for the Closure Cost Estimate is slightly greater than the unit capacities shown in Tables D-1 through D-5 of the Part B Permit Application. This reflects additional volumes of waste that may be present in equipment such as filter presses at the time that the facility is closed.

The types of wastes handled by the Facility and their characteristics are as defined in Tables C-3A through C-3L in the Part B application. Since Romic manages on-site generated wastes the same as off-site generated wastes that are brought into the facility, the above quantities include Romic generated wastes such as still bottoms and personal protective equipment (PPE). In addition, closure activities will generate additional waste materials. The estimated volumes of closure-generated wastes are detailed in the Closure Cost Estimate worksheets in Appendix 4. These wastes will include rinse waters from cleaning tanks and containment areas and contaminated PPE and disposable cleaning or sampling equipment.

This Closure Plan includes waste inventories from process equipment. However, the capacities of process equipment are not included in the Part A application since process equipment is not considered to be storage units. Therefore, the maximum inventory for tanks and process equipment listed above are greater than tank capacities listed in the Part A of the permit application. The maximum waste inventory shown here and used in calculation of the closure cost estimate includes wastes received from off-site, process-generated wastes (such as still bottoms), and wastes generated from Romic activities (such as contaminated personal protective equipment).

<table>
<tr><th colspan="3">Part B Capacities (gals)</th><th colspan="2">Closure Cost Estimate Capacities (gals)</th></tr>
<tr><td>Container Storage</td><td>571,615</td><td>571,615</td><td>Container Storage</td><td>571,615</td></tr>
<tr><td>Existing Tank Storage</td><td>570,300</td><td rowspan="2"></td><td rowspan="3">CCE Base Case Tank and Process Units (includes 1,700 gal Truck Wash Tank)</td><td rowspan="3">874,847</td></tr>
<tr><td>Existing Process Units</td><td>293,838</td></tr>
<tr><td colspan="2">Subtotal</td><td>864,138</td></tr>
<tr><td>Planned Tank Storage</td><td>59,537</td><td rowspan="2"></td><td rowspan="2">CCE Planned Tank and Process Units (includes volumes for drum wash, filter press, etc.)</td><td rowspan="3">211,885</td></tr>
<tr><td>Planned Process Units</td><td>143,160</td></tr>
<tr><td colspan="2">Subtotal Planned Units</td><td>202,697</td><td></td></tr>
<tr><td></td><td>Total</td><td>1,638,450</td><td>Total</td><td>1,658,347</td></tr>
<tr><th colspan="5">Other Wastes (Same for Both Base Case and Planned)</th></tr>
<tr><td colspan="4">Roll-off Bins</td><td>320 cubic yards</td></tr>
<tr><td colspan="4">On-site Generated Waste, not included in above (e.g., activated carbon in process use)</td><td>80 cubic yards</td></tr>
<tr><td colspan="4">Subtotal Bins</td><td>400 cubic yards</td></tr>
</table>

1.6 Disposition of Wastes

For the purposes of the Closure Cost Estimate, off-site treatment and disposal of all hazardous wastes is assumed (assuming independent third party closure). However, the provisions below describe how Romic will manage closure wastes during self-implementation of closure.

During closure, Romic will treat hazardous wastes onsite in appropriately authorized waste management units. This will include the inventory of off-site waste remaining at time of closure implementation as well as wastes generated during closure. Closure generated wastes will include water from decontamination and disposal of consumables such as PPE. Wastes that cannot be treated onsite under the prevailing DTSC permit will be sent offsite to an appropriate TSDF.

Prior to sending any closure wastes offsite for treatment and/or disposal, Romic will assess that each of the TSDFs are permitted to receive the specific waste. In addition, an effort will be made to determine if the TSDFs are in good standing with the authorizing agency. This can be assessed by determining if the TSDF is approved for use by EPA pursuant to the CERCLA Offsite Rule under 40 CFR 300.440.

Standard TSDF waste acceptance procedures will be followed including establishing waste profiles. However as described in Section 1.8, Romic intends to use permitted units at the time of closure to treat the maximum amount of off-site waste and closure generated wastes. Residuals volumes left from final cleaning will require offsite disposal.

Any closure wastes sent offsite for disposal will be placed in proper containers that meet the United Nations performance-oriented packaging standards or bulk containers that meet the U.S. Department of Transportation (DOT) requirements under 49 CFR 172 et seq. All containers used will be properly labeled at time of waste generation and manifested in accordance with generator standards under 22 CCR 66262. A hazardous waste manifest form approved by the state where the receiving facility is located will also accompany all shipments of hazardous waste. Shipments will also be placarded and marked in accordance with U.S. DOT rules. If the receiving state has no special manifest form, a California Manifest form will be used. Land Disposal Restriction (LDR) Forms will be filled out for any hazardous wastes subject to LDR standards. This form will be filled out to identify all the applicable waste codes and treatment standards. These LDR forms will be either maintained with the profile or they will accompany each hazardous waste manifest, depending on the standard procedures of the receiving TSDF. Copies of any LDR forms used will be included with the closure report.

1.7 Closure Schedule

22 CCR 66264.112(b)(6), 66270.14(b)(13)

This section discusses the anticipated closure schedule for the final closure of the facility. Romic will notify DTSC in writing at least 45 days prior to the date final closure is expected to begin, and at least 7 days prior to any closure sampling.

As discussed later, the container storage areas, the tank systems, and the processing equipment will be subject to closure. Since on-site generated wastes will generally be treated within the facility, a portion of the storage and treatment units will remain active to handle closure-generated wastes. As discrete areas or equipment items are decontaminated per this Closure Plan, they will be marked so that they will not be further used. For example, if West Storage Building #1 has had waste removed and been decontaminated, this area will be marked off and so identified. Any closure-generated wastes will be placed in authorized container storage areas that have not yet been closed.

Due to the variety and quantity of wastes and the size of the closure areas, closure is expected to take longer than 180 days. Therefore, Romic will likely require an extension of the 180-day closure time allowance. Table App. 3-1, Closure Schedule, presents the anticipated time required to complete each closure step.

1.8 Closure Activities

22 CCR 66264.112(b)(1) through (7), 66270.14(b)(13)

This section describes closure activities for the hazardous waste management units at the facility. Section 1.8.1, describes the inventory elimination procedures, Section 1.8.2 describes the decontamination procedures, and Section 1.8.3 describes the sampling and analysis procedures. Romic will close the facility sequentially to allow for use of the various waste management units during inventory elimination and decontamination. All closure activities shall be in accordance with a site-specific Health and Safety Plan (HSP), see model copy in Attachment A.

Romic has provided costs for soil sampling and analysis, however, if soil and/or groundwater contamination from past practices is evident, it may be addressed separately under post-closure activities.

During closure, and until DTSC accepts Romic's final closure certification,

- Romic intends to use trained employees for closing the various units. However, facility closure cost estimates are based on third party performance of the closure project.
- All required daily, weekly, and monthly inspections will be performed until the final closure date.
- Normal site security measures, as discussed in Section F of the Part B Permit Application, will be maintained until the final closure certification is accepted by the DTSC.
- The required and applicable standard operating procedures for proper waste management, worker health and safety, and site security will be followed at all times.
- All hazardous wastes within the facility and hazardous waste management units will be processed in the same manner as they would be under normal operating circumstances. Hazardous wastes and process residues will continue to be segregated and stored according to their compatibility.

An independent registered professional engineer (or their agent) will monitor all closure activities to ensure they are conducted in accordance with the approved Closure Plan. The certifying engineer (or their agent) will monitor closure activities such as storage and treatment system decontamination, secondary containment decontamination, and soil sampling and analysis.

After receiving the final volume of waste into the facility, the container inventory will be eliminated first through on-site treatment and off-site disposal or shipped directly off site for treatment and disposal. Empty containers will be salvaged, reconditioned, or disposed at an appropriate off-site facility.

To the maximum extent allowed, the wastewater treatment system and distillation equipment will be used to treat wastewaters and rinsate generated from closure activities. Therefore, the final closure of these units will occur after all container inventories have been completed and the majority of the site-wide containment area decontamination and confirmation sampling and analysis have been completed.

If the containment areas cannot be successfully decontaminated, they may require removal and disposal at an off-site permitted facility. An alternate procedure will be to break up the containment areas prior to any decontamination and dispose of them at an off-site permitted facility.

After the containment areas have been decontaminated or removed, foundation soils will be sampled and analyzed for contaminants as described in Section 1.8.3, Sampling and Analysis.

1.8.1 Inventory Elimination

22 CCR 66264.112(b)(3), 66270.14(b)(13)

The hazardous waste inventory processed during closure will be managed in the same manner as they would be under normal operating circumstances. However, closure costs reflect the cost associated with sending all inventory off-site for treatment and/or disposal. Bulk shipment by rail is assumed for wastes sent to facilities that can receive rail shipments. The elimination scenarios are described in detail in the Closure Cost Estimate Worksheets, Appendix 4 in Volume 2 of the Part B Permit Application. Remaining treatment chemicals will be sold for beneficial re-use, or will be transported for use at another facility.

It is assumed for purposes of third party closure, that the drums will be inventoried in accordance with information on the hazardous waste labels and Romic's waste tracking numbers (see Section C). An allowance has been made that a small percentage of the drums will have labels that are illegible or non-existent. These drums will be subject to hazard categorization (haz cat) procedures to identify the waste type and therefore, the appropriate disposal disposition. After the haz cat procedure, additional laboratory testing may be required for disposal purposes.

1.8.2 Decontamination Procedures

22 CCR 66264.112(b)(4), 66264.114, 66270.14(b)(13)

This section describes the decontamination procedures that will be used to attain the closure performance standards specified in Section 1.2 during closure activities at the Facility. The decontamination policies and/or requirements listed below are based on federal and state regulations, USEPA closure guidance manuals, DTSC closure guidance manuals, and Romic company policies and standard operating procedures. The decontamination policies and/or requirements are designed to ensure that all federal and state requirements for decontamination during closure will be met. Decontamination procedures to be used during closure activities are described below:

- All equipment, including mobile equipment and earth moving equipment that has come in contact with hazardous waste constituents during closure activities will be decontaminated before use outside the contaminated area or removal from the site.
- During closure, contaminated equipment, containment system components, and structures will be decontaminated for salvage or beneficial use, or disposed of at an appropriately-permitted off-site facility.

- Contaminated environmental media (soil and/or groundwater) will be cleaned-up to risk-based cleanup levels or removed and disposed at an off-site facility that is appropriately authorized to handle such wastes.
- Any residues generated during decontamination activities will be handled in accordance with all applicable requirements of 22 CCR 66264.114. Decontamination rinsate will be appropriately treated on site or shipped off site for treatment and disposal.
- Secondary containment surfaces, tanks, and equipment will be decontaminated to achieve the closure performance standards if they are to be left onsite or sent off-site for reuse. Secondary containment surfaces, tanks, and equipment that will be sent for off-site disposal, may be cleaned or they may be removed and disposed without cleaning.

During the final decontamination stage, a small temporary decontamination area (approximately 10 feet by 20 feet) may be established on site once all concrete containment areas have been decontaminated. This area will be constructed of plastic sheeting or an equivalent protective material, and will be used for decontamination of sampling equipment, personal protective equipment, and other miscellaneous small equipment used during decontamination and sampling efforts.

After the final high-pressure washing has been completed and decontamination rinsate collected, the plastic sheeting or equivalent material and rinsate will be removed for off-site treatment and disposal at an approved/permitted facility.

Decontamination Technologies

Tanks, piping, process equipment and containment systems will be decontaminated using one or more of the following technologies:

- Rinsing by high-pressure washers with water or detergent/surfactant solution will be done to remove scaling and surface debris. Steam cleaning may be used in addition to or in lieu of high-pressure water wash
- Hydroblasting will be used to remove surface materials not removed by pressure washing or steam cleaning. Hydroblasting is a high-pressure technology that scours the surface, removes contaminants (and part of the surface in the case of concrete), and carries the contaminant away from the surface. Hydroblasting is a physical technology that is not dependent upon the contaminant being soluble in the aqueous phase.
- Some tanks, piping, process equipment and containment systems may be evaluated and will be removed for off-site disposal in lieu of being cleaned.

Decontamination of Containment Pads

The decontamination procedures discussed here cover all concrete containment surfaces including, but not limited to, the container storage areas, loading/unloading areas, container processing areas, and tank system containment structures. These procedures also apply to the sump systems throughout the facility.

The containment surfaces will be inspected for cracks or gaps prior to decontamination to determine possible biased soil sampling locations. The containment pads then will be decontaminated by an appropriate decontamination procedure, such as hydroblasting. The containment surfaces will be inspected once again for cracks or gaps to determine possible biased soil sampling locations. Areas damaged solely by the cleaning process need not be considered for biased sampling locations.

Decontamination of Tank Systems

The decontamination procedures discussed in this section will be used for the regulated tanks, distillation equipment, and associated pumps and piping. These procedures also will be used to decontaminate waste processing equipment (e.g. shredder, liquefaction system).

Decontamination will be accomplished using an appropriate hydroblasting/waterwashing method to achieve the closure performance standard identified in Section 1.2. Verification will be done by wipe sampling if the tank is to be reused, transferred to another location for use, or left onsite. If the tank will just be removed for disposal, confirmation sampling may not be required.

Rinsate and cleaning residue from all washings will be characterized per 22 CCR 66262.11, and managed accordingly. All rinsate will be removed by a vacuum truck or equivalent means. Incompatible rinsate and cleaning residues will not be commingled. The collected rinsate will be treated appropriately on site, or when necessary, sent off site for treatment and disposal at an appropriately permitted facility.

Decontaminated tanks that meet the closure performance standard may be re-used, sold for re-use, or scrapped. Decontaminated tanks may also be left in place on the containment pad unless removal of concrete or soil under the containment system becomes necessary. As an alternative to decontamination and leaving tanks in place, tanks may be decontaminated and scrapped.

Decontaminated tanks to be scrapped will be rendered unusable prior to leaving the facility. This will be accomplished by cutting the tanks in half, or by cutting the ends off of the tanks. Prior to removal of decontaminated tanks, written proof of decontamination will be obtained from the independent professional engineer monitoring closure activities.

As an alternative to tank decontamination, tanks may be rinsed and disposed of at an appropriately permitted off-site facility as hazardous waste, non-hazardous waste, or exempt scrap metal after waste characterization in accordance with 22 CCR 66262.11 and 22 CCR 66261.3(e).

Decontamination of Equipment

Before transport off site, all equipment subject to closure will be decontaminated to remove gross contamination. If equipment is to be left onsite, it will be cleaned by one or more of the following methods as appropriate: scraping, rinsing with high-pressure water, steam, a caustic-type industrial cleaning solution, or detergent solution. The equipment will be cleaned until the closure performance standard is met. Equipment decontamination may be performed in a specific decontamination staging area with adequate secondary containment. All rinsate from decontamination will be collected and treated appropriately at the facility or, when necessary, sent off site to an appropriately permitted facility. If equipment cannot be decontaminated, it will be disposed of as hazardous waste at an appropriately permitted off-site facility. Equipment potentially requiring decontamination includes trucks, sampling equipment, forklifts, hoses, pumps, and cleaning and decontamination equipment.

1.8.3 Sampling and Analysis

22 CCR 66264.112(b)(4), 66264.114, 66270.14(b)(13)

This section generally describes the sampling and analysis procedures to be used for closure activities at the facility. Detailed information on sampling and analysis is provided in the Sampling and Analysis Plan, Attachment B to this Closure Plan. All collection of samples will be in accordance with the Sampling and Analysis Plan, which includes provisions for using standard test methods, a California-certified laboratory for analyses, proper chain-of-custody procedures, and quality control/quality assurance samples such as field blanks, trip blanks, and duplicate samples.

Secondary Containment Sampling and Analysis

Sampling and analysis of secondary containment structures will be performed in accordance with the recommendations outlined in DTSC's "Permit Writer Instructions for Closure of Treatment and Storage Facilities". Chip or wipe samples will be collected and analyzed as specified in the Sampling and Analysis Plan, Attachment B to this Closure Plan.

Tanks, Process Equipment, Ancillary Equipment, and Structures

Sampling and analysis of tanks, process equipment, ancillary equipment, and structures will be performed in accordance with the recommendations outlined in DTSC's "Permit Writer Instructions for Closure of

Treatment and Storage Facilities". Wipe samples will be collected and analyzed as specified in the Sampling and Analysis Plan, Attachment B to this Closure Plan.

Soil Sampling and Analysis

The soil underlying secondary containment pads will be sampled and analyzed to confirm that no residual contamination is present. The purpose of soil sampling and analysis is to identify areas where remediation may be necessary as a result of past practices and to support such activity.

Grid and bias samples collection depths will be just below the containment system/soil interface in native soils, and at both about 1 meter and 2 meters below the interface. Soil samples will be collected through holes bored in the overlying containment systems. Samples will be collected using either hand augers, shallow test pits, or direct push sampler (for example, Geoprobe). The soil borings and samples will be collected from the approximate locations shown in the Sampling and Analysis Plan Figure 4. The borings will be continuously cored and boring logs generated. The field geologist will screen extracted soil cores for physical evidence of contamination (e.g., odors, chemical sheen, or discoloration). The soil samples will be removed from the sampling device, sealed with Teflon tape, capped, labeled, and placed in a pre-chilled ice chest.

After the samples are collected, each boring will be backfilled with grout. The collected samples will be transferred under formal chain-of-custody documentation to a California-certified laboratory to be analyzed individually as specified in the Sampling and Analysis Plan. Other sample collection, documentation, and handling procedures will be in accordance with standard procedures described in Test Methods for Evaluating Solid Waste, SW-846, U.S. Environmental Protection Agency, November 1986.

Soils beneath all sumps in secondary containment areas will be sampled as biased sampling locations, since the sumps would be the most likely collection point of any contaminants. Locations of cracks or stains in the secondary containment system will also be priority locations for biased sampling. Visual observation of past repair locations and repair records maintained as part of the facility's operating log will be used to determine selective locations for bias soil sampling during closure. Additional samples are included for this purpose.

Grid samples will be based upon a fixed square grid, with an interval spacing determined by DTSC guidance and is detailed in the Sampling and Analysis Plan.

Analytical results from soil samples taken during unit closure will be compared to either: 1) the "background" levels for metals and "non-detect" levels for the remainder of the parameters, or 2) the risk-based site-specific levels determined as described in Section 1.2, Closure Performance Standards. The "non-detect" and "background" levels will be established as specified in Attachment C, Sampling and

Analysis Plan. DTSC will be provided with all analytical results and included in discussions to determine when closure has been successfully completed.

Romic will use approved analytical methods capable of achieving quantification limits that are adequate for demonstrating whether compliance with clean closure standards defined in this Closure Plan. For example, the following methods, or approved methods that replace them, shall be used:

- EPA Method 8260B for volatile organic constituents;
- EPA Method 8270C for semi-volatile organic constituents;
- EPA Method 6010B for metals; and
- EPA 8081A for organochloride pesticides.

1.8.4 Partial Closure

22 CCR 66264.112(b)(4)

During the course of operations it may be necessary to close portions of hazardous waste management units in the facility. An example of this type of closure would be the replacement of a tank that has developed a leak or integrity assessment indicates that the minimum shell thickness is inadequate for storage or treatment.

Tanks and ancillary equipment may be closed in their original location, or moved to an alternative location on the site, as long as the closure is conducted within a secondary containment system. Tanks and ancillary equipment shall be moved to an alternative location only if such transport can be achieved without spilling any waste from the vessel or ancillary equipment; and the movement will not jeopardize the integrity of the waste management equipment. Romic shall maintain records of partial closure activities and include them with the final documentation of Closure as described in Section 7.3. The procedures for partial closure are described in detail in Attachment C, Partial Closure Activities.

2 POST-CLOSURE PLAN

22 CCR 66270.14(b)(13), 66264.118(a), 66264.197(c)(2), 66264.228(b) and (c)(1), 66264.258(b) and (c)(1)(B), 66264.303(c), 264.310(b)

Romic has not operated hazardous waste disposal units at their East Palo Alto facility. The tank system at the facility includes adequate secondary containment, and thus will not be subject to the contingent post-closure plan requirements of 22 CCR 66264.197(c)(2). If Romic cannot achieve clean closure, Romic will submit an amended closure plan and/or a post-closure plan. Soil and groundwater contamination from past practices are identified separately in the facility's corrective action order issued pursuant to RCRA Section 3008(h) and administered by the EPA. It is expected that corrective action will be completed prior to final closure of the facility. Therefore, post-closure cost estimates are not provided. Should ongoing corrective action measures not fully address soil and groundwater contamination, a post-closure permit could be required.

3 CLOSURE COST ESTIMATES

22 CCR 66270.14(b)(15), 66264.142

This section identifies some of the key assumptions and bases used in developing the Closure Cost Estimate (CCE), Appendix 4 to the Part B Permit Application. As stated earlier, This Closure Plan (and the CCE) assumes that all applicable Corrective Action requirements have been satisfied before the initiation of closure activities.

Regulatory Requirements

- Romic has prepared a closure cost estimate in accordance with 22 CCR 66264.142(a).
- Romic will adjust the closure cost estimate annually for inflation, and/or other factors, in accordance with 22 CCR 66264.142(b). Romic will make this adjustment within sixty days prior to the anniversary date of its closure financial assurance mechanism.
- Romic will revise the closure cost estimate as necessary in accordance with 22 CCR 66264.142(c), within thirty days of any modification of the Closure Plan that results in a change in the cost required to close the facility.
- Romic will revise the closure cost estimate and closure financial assurance mechanism at least thirty days before operating a new hazardous waste management unit.
- Romic will maintain at the facility a copy of the most current cost estimate in accordance with 22 CCR 66264.142(d). Detailed cost estimates for closing the facility at maximum waste inventory are provided in Appendix 4, Volume 2 of the Part B Permit Application.

Cost Factors

The unit costs associated with closure of the facility are based on the following assumptions and procedures.

- The unit costs for all closure activities are based on the cost of hiring a third party to close the facility. A third party is someone other than the parent or subsidiary of the owner or operator. However, it is intended that trained site personnel will be used to conduct closure activities to the greatest extent possible in order to maintain continuity of facility operation.
- Unit costs were obtained, where possible, from actual operating costs and experience, and contractor estimates.
- Unit transportation costs used for estimating inventory elimination costs are based on contractor estimates for transporting bulk and containerized solids and liquids to an off-site permitted treatment and/or disposal facility. Bulk liquid shipments are assumed to be by rail for wastes when practical (e.g., aqueous wastes and fuel blending wastes). Unit disposal costs for off-site landfill, incinerator, hazardous waste fuel, and other treatment options are based on Romic operating experience.

Other Assumptions

- Treatment costs are rates presently estimated for existing waste management units.
- Supplies and equipment will be salvaged to the extent possible. However, salvage value has not been incorporated into the closure cost estimate. Romic on-site equipment (e.g., crane, lifts, and vacuum tankers) will be used where possible to close the facility. Outside contractors' equipment will be used as necessary.
- Cost for decontaminating sampling equipment between samples is considered to be negligible.
- A total of 164 drums (2.5%) were considered to be inadequately labeled and would require analysis or HAZCAT procedures to determine appropriate disposition.

3.1 Inventory Elimination Costs

The costs associated with eliminating the remaining waste inventory at facility closure are presented in the CCE. Cost estimates are based on maximum waste inventory, and are broken down by specific inventory elimination scenarios. The types and amounts of wastes handled at the facility are well documented in the annual reporting requirements to the applicable regulatory agencies. The Closure Cost Estimate worksheets identify the recent historical mix of waste into the facility to arrive on quantities of specific waste streams.

The maximum waste inventory for tanks and process equipment is summarized in Section 1.5 of the Closure Plan.

3.2 Facility Closure Costs

The closure costs for decontamination of facility equipment, waste management units, and rinsate management are summarized in the CCE, Appendix 4 in Volume 2 of the Part B Permit Application. Tanks and equipment will be salvaged to the extent possible. However, salvage value has not been incorporated into the closure cost estimate. Detailed estimates for sampling and analytical costs are included in the CCE, which allows for blanks, duplicates, and other quality control/quality assurance samples.

There are two cost estimate worksheets presented. The first is the cost for the Base Case Facility. This includes the existing tanks and permitted process units as of November 9, 2001 in addition to the Truck Wash, Solids Consolidation and Debris Shredding operations. The second cost estimating worksheet, identifies the incremental costs for each of the proposed additions. As a unit is to be built, the closure cost funding will be increased by the amount for the incremental addition above the Base Case Facility.

4 POST-CLOSURE COST ESTIMATE REQUIREMENTS

22 CCR 270.14(b)(16), 66264.144, 66264.197(c)(3) and (c)(5)

Romic has not operated hazardous waste disposal units at their East Palo Alto facility. The tank system at the facility includes adequate secondary containment, and thus will not be subject to the contingent post-closure care cost estimate requirements of 22 CCR 66264.197(c)(3) and (5). Although soil and groundwater contamination from past practices may be identified at the facility, this contamination will be addressed by the USEPA corrective action requirements. It is expected that corrective action will be completed prior to final closure of the facility. Therefore, post-closure cost estimates are not provided. If Romic is required to obtain a post-closure permit, then a post-closure cost estimate will be submitted.

5 NOTICE IN DEED REQUIREMENTS AND SURVEY PLAT REQUIREMENTS

22 CCR 66270.14(b)(14), 66264.116, 66264.117(c), 66264.119

Romic has not operated hazardous waste disposal units at their East Palo Alto facility. The tank systems at the facility include adequate secondary containment, and thus will not be subject to the contingent post-closure care requirements of 22 CCR 66264.197(c)(2) and (c)(5).

No regulated units containing hazardous wastes will remain at the site after closure; therefore, a notice in deed regarding restrictions on the use of land used to manage hazardous wastes will not be necessary. Similarly, a survey plat indicating the location of landfill cells or other hazardous waste disposal units remaining on site will not be required. If Romic cannot achieve clean closure, Romic will comply with deed notice and survey plat requirements.

6 FINANCIAL ASSURANCE MECHANISM

22 CCR 66270.14(b)(15) and (16), 66264.143, 66264.145, 66264.197(c)(4) and (c)(5)

Romic will demonstrate continuous compliance with 22 CCR 66264.143 by providing documentation of financial assurance in at least the amount of the current cost estimate. A copy of the current financial assurance mechanism is provided in the Appendix to Section K of the Permit Application. The owner/operator, chief financial officer, or their designee pursuant to 22 CCR 66264.143 must approve changes in the financial assurance mechanism.

The financial assurance mechanism will be adjusted prior to the operation of any planned units. The financial assurance mechanism will be adjusted to satisfy closure requirements as outlined in this permit application and article 7, Chapter 14 of 22 CCR.

7 Reporting and Recordkeeping

22 CCR 66264.112(a)(2), (c), (d)(1); 66264.115

7.1 Closure Notification

Romic will notify DTSC in writing at least 45 days prior to the date that final closure is expected to begin, and at least 7 days prior to any closure performance sampling.

7.2 Closure Plan Amendment

Changes in facility plans, operations or scheduling may require that the Closure Plan be amended. Additionally, DTSC may request amendments. An amended Closure Plan will be submitted to the Department of Toxic Substance Control (DTSC) with a written request for a change to the approved Closure Plan.

7.3 Certification Report Requirements

Romic will submit to DTSC certification that the final closure of the facility has been conducted in accordance with the specifications of the approved Closure Plan. This certification will be signed by Romic and by an independent professional engineer. The certification will be submitted to DTSC within 60 days of completion of final closure. The certification report shall include the following:

1. Certification by an independent registered professional engineer;
2. Supervisory personnel description;
3. Summary of Closure Activities;
4. Field Engineer Observation Reports;
5. Sampling Data and Analyses (i.e., sampling locations, soil boring logs, chain of custody, analytical results, etc.);
6. Discussion of Analytical Results;
7. Manifests showing disposition of waste inventory;
8. Modifications and Amendments to Closure Plan (if applicable);
9. Photographs.

7.4 Recordkeeping

A copy of the approved Closure Plan, and subsequent authorized amendments, will be maintained at the facility until closure is complete and certified.

TABLES

TABLE App. 3-1 CLOSURE SCHEDULE

CLOSURE STEP	EST. TIME REQUIRED	EST. COMP. DATE
Inventory elimination	12 weeks	Week 12
Container storage area decontamination	4 weeks	Week 16
Tank systems decontamination	6 weeks	Week 22
Process unit decontamination	6 weeks	Week 28
Ancillary equipment decontamination	4 weeks	Week 32
Soil sampling/analysis	8 weeks	Week 40
Preparation of closure report and certification	8 weeks	Week 48
Submittal of closure certification to DTSC	8 weeks	Week 56

ATTACHMENT A

HEALTH AND SAFETY PLAN

ATTACHMENT B

SAMPLING AND ANALYSIS PLAN

ATTACHMENT C

PARTIAL CLOSURE ACTIVITIES

Partial Closure Activities

Tanks

- Drain the tank of all liquids.
- Open the tank and visually inspect for sludges. If sludges are present, go to next step; if not, skip next step and proceed with steam cleaning.
- Conduct a confined space entry, following procedures set forth in Romic's Health and Safety Plan, and pump sludge from tank. The addition of solvents may be employed to facilitate the dissolving of solids to allow the vacuum removal of sludges. (2 days)
- Steam clean or water wash the tank to achieve "clean debris standards" on the tank walls.
- Disconnect piping and any other associated ancillary equipment from the tank.
- Remove the tank from the secondary containment system.
- Visually inspect the secondary containment system and foundation that supported the tank for any cracks or deterioration in the concrete and protective coatings.
- A professional engineer registered in the State of California, or their agent, will inspect and certify that the tank meets the "clean debris surface" standards of Table 1 CCR 66268.45.
- If the tank still contains residue that could not be removed, the tank will be managed as a hazardous waste and shipped off-site to an authorized facility for further management. It may be necessary to cut the tank into sections for shipment off-site.

Piping:

- Steam clean or pressure wash the pipe collecting all rinse water and contaminants.
- Disconnect piping from tank.
- Triple rinse with caustic solution, collecting the rinse water for further management as a hazardous waste.
- Visually inspect to ensure "clean debris surface" standards have been met on the inside and outside of piping walls. If necessary, dismantle or cut piping. If unable to visually inspect, Romic may dispose of contaminated piping as hazardous waste/contaminated debris.
- A professional engineer registered in the State of California, or their agent, will inspect and certify that the piping meets the "clean debris surface" standards of Table 1 CCR 66268.45.
- Manage the residues as a hazardous waste unless analytical results indicate that the waste is not hazardous.
- Romic may elect to skip decontamination procedures for piping and manage the piping as a hazardous waste for disposal at an off-site authorized facility.

Pumps

- If possible, use the pump associated with the ancillary equipment to pump the caustic wash solution during the triple rinsing operation.

- If the pump is not operational, or the capacity is not appropriate for the triple rinsing operation, disassemble the pump and submerge all areas which have contacted hazardous waste in cleaning solvent (e.g., n-Methyl Pyrrolidine) for 1-3 hours. Follow the solvent decontamination step with a caustic wash.
- A professional engineer registered in the State of California, or their agent, will inspect and certify that the pump meets the closure performance standard.
- Manage the residues as a hazardous waste unless analytical results indicate that the waste is not hazardous.
- Romic may elect to skip the decontamination procedures describe above and ship the contaminated pump off-site as a hazardous waste.

Secondary Containment systems:

It is unlikely that any secondary containment systems will undergo partial closure, however if unforeseen events require a secondary containment system to be closed, the system will be closed per the applicable requirements specified in the Section 1.2, Closure Performance Standards.

APPENDIX B-1

FLOOD PLAIN DATA AND CERTIFICATIONS

ROMIC ENVIRONMENTAL TECHNOLOGIES

FLOODPLAIN REPORT

7/20/2001

On June 21, 2001, using accepted surveyor's methods, a level loop was performed to determine which portion of the facility is below the base flood elevation (BFE). The level loop determined that four areas of the facility were below the BFE. A study was made to determine compliance with the location standards for hazardous waste facilities related to floodplains specified in 22 CCR 66264.18(b) and 66270.14(b)(11)(B), (C), (D). A site map was produced which shows the relative elevations in the facility (see figure titled: floodplainsareas 1). The majority of the facility perimeter is above elevation 8'-0" mean sea level (MSL), which is the 100-year flood level identified by the Federal Emergency Management Agency (FEMA) in their latest August 23, 1999 revision of the Flood Insurance Rate Map for the City of East Palo Alto, CA- Community-Panel Number 060708 0001 B. This map indicates the maximum flood levels in the area. The Romic facility is located outside ZONE VE (areas with potential for high hydrodynamic forces) and, as a result, potential floodwaters are expected have low hydrodynamic forces.

The 100-year flood can enter in one area of the facility and as a result, there are four areas in the plant that need to be evaluated to withstand the potential hydrostatic and hydrodynamic forces. The first area that is below the 8 foot MSL is the Production Area with an average elevation of 6.10 feet MSL. There is no concern for washout here because the process vessels located in this area are elevated more than two feet which raises them above the 8 foot MSL. There will be minimal hydrodynamic forces present in this area based as this area is outside the FEMA designation ZONE VE.

The second area is Tank Farm "I" with top of curb elevation of 7.81 feet MSL. There is no concern for washout here because all of the tanks and process vessels are elevated by more than two feet in this area. There will be minimal hydrodynamic forces present in this tank farm based as it is outside the FEMA designation ZONE VE

The third area is the 2100 square-foot West Storage Area #1 with an average elevation of 7.38 feet MSL. The 55-gallon containers stored in this area can be easily moved by forklift to higher ground within a short time if necessary. As such, neither the hydrostatic nor the hydrodynamic forces are a concern because of the mobility of these containers.

The fourth area is Tank Farm "Q" with the top of the curb elevation in this area being 7.49 feet MSL. The tanks that are secured to the concrete slab with bolts will withstand the hydrostatic forces present during a flood based on bolt tie down strengths (see Tie Down Strengths in Table 1). The tanks that are not secured to the concrete were also analyzed for hydrostatic forces and based on the calculations, the tanks in question will need protection from the hydrostatic forces of the maximum projected flood waters. There will be minimal hydrodynamic forces present in this tank farm as this area is outside the FEMA designation ZONE VE. The wall height needs to be raised by 6 inches

ROMIC ENVIRONMENTAL TECHNOLOGIES

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7/20/2001

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The fourth area is Tank Farm "Q" with the top of the curb elevation in this area being 7.49 feet MSL. The tanks that are secured to the concrete slab with bolts will withstand the hydrostatic forces present during a flood based on bolt tie down strengths (see Tie Down Strengths in Table 1). The tanks that are not secured to the concrete were also analyzed for hydrostatic forces and based on the calculations, the tanks in question will need protection from the hydrostatic forces of the maximum projected flood waters. There will be minimal hydrodynamic forces present in this tank farm as this area is outside the FEMA designation ZONE VE. The wall height needs to be raised by 6 inches to provide adequate protection from a 100-year flood. Romic is committed to making this change within the compliance schedule identified in the Part B application.

This certification below is being made contingent upon Romic completing the modification to raise the secondary containment wall on Tank Farm Q.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

REGISTERED PROFESSIONAL ENGINEER
STEVEN A. ARNOLD
C 22301
Exp. 9-30-01
CIVIL
STATE OF CALIFORNIA

Steven A. Arnold
Registered Professional Engineer
CE 22301

See documents numbered 1 – 9 and the Romic Site map attached

R:\common\part-b-2000\civil engineer documents\floodplaincert4

CALCULATED BY: ______
CHECKED BY: ______
SIGNED BY: ______
FILE NO: ______

STEVEN ARNOLD
Civil Engineer
1885 The Alameda Suite 130
SAN JOSE, CALIFORNIA 95126

JOB NUMBER: ______
PROJECT: ______
DATE: 28 June 01
SHEET NO. 1 OF 9

Tank Farm Q
Romic Environmental Tech
Flood Plain Analysis

The following tanks are bolted to concrete foundations. These tanks will not be effected by flood waters

Tanks
AES1, AES2, AES3 & AES4

Tanks
T61, T64, T65, T71, T75 & T77

REGISTERED PROFESSIONAL ENGINEER
STEVEN A. ARNOLD
C 22301
Exp 9-30-01
CIVIL
STATE OF CALIFORNIA

28 June 01

The following tanks are not bolted to the concrete

Tanks
T60, T62, T63, T66, T67, T68, T69, T70, T73
T74, T76,

CALCULATED BY: ______
CHECKED BY: ______
SIGNED BY: ______
NO: ______

STEVEN ARNOLD
Civil Engineer
1885 The Alameda Suite 130
SAN JOSE, CALIFORNIA 95126

JOB NUMBER: ______
PROJECT: ______
DATE: 28 June 01
SHEET NO. 2 OF 9

Flood Plain Analysis
Tank Farm Q

Tanks T60, T62, T63 are 12' ⌀ 23' high (.167 shell, .24 bot.)

Tank wt. .167 in → 6.8 #/SF .24 in → 9.7 #/SF

wall

$\pi D \times h \times 6.8$ #/SF

$3.14(12)23' \times 6.8$ #/SF = 5893#

bottom

$\frac{\pi D^2}{4} \times 9.7$ #/SF

$\frac{3.14(144)}{4}(9.7)$ = 1096#

lid

$\frac{\pi D^2}{4} / 6.8$ #/SF = 768#

Total 7757#

Bouyant Force on tank

$3' \times \frac{\pi D^2}{4} \times 62.5$ #/SF = 21,195# > D.L. Tank

CALCULATED BY:	**STEVEN ARNOLD** Civil Engineer 1885 The Alameda Suite 130 SAN JOSE, CALIFORNIA 95126	JOB NUMBER:
CHECKED BY:		PROJECT:
SIGNED BY:		DATE: 28 June 01
ENO:		SHEET NO. 3 OF 9

Flood Plain Analysis
Tank Farm Q

Tank 66 — 12'ϕ 24' high — .115 shell, .24 bott

wall

$\pi D \times h \times 4.7\ \#/SF$

$3.14(12)24 \times 4.7\ \#/SF = 4250\#$

lid

$\frac{\pi D^2}{4} \times 4.7\ \#/SF = 531\#$

bottom

$\frac{\pi D^2}{4} \times 9.7\ \#/SF = 1096\#$

$5877\#$

Bouyant Force on Tank

$3' \frac{\pi (12)^2}{4} \times 62.4 = 21161\#$

CALCULATED BY:
CHECKED BY:
SIGNED BY:
NO.:

STEVEN ARNOLD
Civil Engineer
1885 The Alameda Suite 130
SAN JOSE, CALIFORNIA 95126

Flood Plain Analysis
Tank Farm Q

Tank 67 — 11'ϕ — 28' hi — .167 shell — .24 bottom

Wall

$\pi D \times h \times 6.8\ \#/SF$

$3.14(11) \times 28 \times 6.8$ — 6576 #

lid

$\frac{\pi D^2}{4} \times 6.8\ \#/SF$ — 645 #

bottom

$\frac{\pi D^2}{4}(9.7\ \#/SF)$ — 921 #

8142 #

Bouyant Force on Tank

$\frac{3'\pi (11)^2}{4} \times 62.4\ \#/SF = 17{,}781\ \#$

CALCULATED BY: ____
CHECKED BY: ____
SIGNED BY: ____
NO.: ____

STEVEN ARNOLD
Civil Engineer
1885 The Alameda Suite 130
SAN JOSE, CALIFORNIA 95126

JOB NUMBER: ____
PROJECT: ____
DATE: 28 June 01
SHEET NO. 5 OF 9

Flood Plain Analysis
Tank Farm Q

Tank 68 16' ø 24' high .115 shell .158 bottom

Wall

$\pi D \times h \times 4.69$ #/SF

$3.14(16) \times 24 \times 4.69$ #/SF = 5655#

bottom

$\frac{\pi D^2}{4} \times 6.4$ #/SF = 1286#

lid

$\frac{\pi D^2}{4} \times 4.69$ = 942

7883#

Bouyant Force on Tank (tank is on 12" pad)

$\frac{2' \pi (16)^2}{4} \times 62.4 = 25079$#

CALCULATED BY: ______
CHECKED BY: ______
SIGNED BY: ______
NO.: ______

STEVEN ARNOLD
Civil Engineer
1885 The Alameda Suite 130
SAN JOSE, CALIFORNIA 95126

JOB NUMBER: ______
PROJECT: ______
DATE: 28 June 01

Flood Plain Analysis
Tank Farm Q

Tank 69 12' ϕ 24' hi .115 shell .158 bottom

wall

$\pi D \times h \times 4.69\ \#/SF$

$3.14(12)24 \times 4.69 = 4241\#$

lid

$\frac{\pi D^2}{4} \times 4.69\ \#/SF$ $530\#$

bottom

$\frac{\pi D^2}{4} \times 6.4\ \#/SF$ $723\#$

$5494\#$

Bouyant Force on Tank (15" base)

$\frac{1.75\ \pi (12)^2}{4} \times 62.4 = 12{,}343\#$

CALCULATED BY:	**STEVEN ARNOLD**	JOB NUMBER:
CHECKED BY:	Civil Engineer	PROJECT:
SIGNED BY:	1885 The Alameda Suite 130	DATE: 28 June 01
NO:	SAN JOSE, CALIFORNIA 95126	SHEET NO. 7 OF 9

Flood Plain Analysis
Tank Farm Q

Tank 70 — 30' ϕ 30' hi .167 shell .24 bottom

wall

$\pi D \times h \times 6.8\ \#/SF$

$3.14(30)(30)\,6.8 =$ 19216 #

lid

$\frac{\pi}{4}(30)^2\,6.8\ \#/SF$ — 4804 #

bottom

$\frac{\pi}{4}\left((30)^2\,9.7\ \#/SF\right)$ — 6853

30,873 #

Bouyant Force on Tank

$3' \frac{\pi D^2}{4} \times 62.4 =$ 132,256 #

CALCULATED BY:	**STEVEN ARNOLD** Civil Engineer 1885 The Alameda Suite 130 SAN JOSE, CALIFORNIA 95126	JOB NUMBER:
CHECKED BY:		PROJECT:
SIGNED BY:		DATE: 28 June 01
LICENSE NO:		SHEET NO. 8 OF 9

Flood Plain Analysis

Tank Farm Q

Tanks 73 & 74 10' ϕ 20' high .167 shell .24 bottom

wall

$\pi D \times h \times 6.8 \#/SF$ 4270#

lid

$\frac{\pi D^2}{4}(6.8\#/SF)$ 533#

bottom

$\frac{\pi D^2}{4}(9.7\#/SF$ 761#

5564#

Bouyant Force

$\frac{3 \pi (10)^2}{4} \times 62.4$ 14,695#

CALCULATED BY:	**STEVEN ARNOLD**	JOB NUMBER:
CHECKED BY:	Civil Engineer	PROJECT:
SIGNED BY:	1885 The Alameda Suite 130	DATE: 28 June 01
NO:	SAN JOSE, CALIFORNIA 95126	SHEET NO. 9 OF 9

Flood Plain Analysis

Tank Farm Q

Tank 76, 77 14'ϕ 24' high .115 shell .158 bottom

wall

$\pi D \times h \times 4.7$ #/SF 4958 #

lid

$\frac{\pi D^2}{4} \times 4.7$ #/SF 723 #

bottom

$\frac{\pi D^2}{4} \times 6.44$ #/SF 990 #

6671 #

Bouyant Force

$$3 \times \frac{\pi D^2}{4} \times 62.4 = 28{,}802\ \#$$

Tank 77 is restrained by 6 3/4" bolts

TABLE 1

TANKFARM Q TANK FLOODPLAIN SUMMARY

Tank	Dia. (ft)	Ht. (ft)	Shell Thickness	Shell Density (#/sf)	Bottom Thickness	Bottom Density (#/sf)	Top Thickness	Top Density (#/sf)	Pad Ht (ft)	Tank Wt (lb)	Buoyant Force (lb)	Num/Size of Bolts	Tie Down Strength (lb)
60	12	23	0.167"	6.8	0.24"	9.7	0.167"	6.8	0.33	7762	18,873	0	0
61	12	15.5	0.1875"	7.63	0.1875"	7.63	0.1875"	7.63	0.75	6184	15,904	(8) 1 1/4"	84,000
62	12	23	0.167"	6.8	0.24"	9.7	0.167"	6.8	0.417	7762	18,258	0	0
63	12	23	0.167"	6.8	0.24"	9.7	0.167"	6.8	0.417	7762	18,258	0	0
64	12	23	0.25"	10.21	0.3125"	10.21	0.1875"	10.21	0.75	11162	15,904	(16)1 1/2"	168,000
65	12	23	0.25"	10.21	0.3125"	10.21	0.1875"	10.21	0.75	11162	15,904	(16)1 1/2"	168,000
66	12	24	0.115"	4.7	0.24"	9.7	0.115"	4.7	1.5	5881	10,603	0	0
67	11	28	0.167"	6.8	0.24"	9.7	0.167"	6.8	0.417	8148	15,342	0	0
68	16	24	0.115"	4.7	0.158"	6.4	0.115"	4.7	1.25	7902	21,991	0	0
69	12	24	0.115"	4.7	0.158"	6.4	0.115"	4.7	1.25	5508	12,370	0	0
70	30	30	0.167"	6.8	0.24"	9.7	0.167"	6.8	0	30890	132,536	0	0
71	17	20.5	0.193"	8.12	0.193	8.12	0.196"	8.12	2	12576	14,186	(12) 1"	N/A Elevated
73	10	20	0.167"	6.8	0.24"	9.7	0.167"	6.8	0.417	5568	12,679	0	0
74	10	20	0.167"	6.8	0.24"	9.7	0.167"	6.8	0.417	5568	12,679	0	0
75	9.5	24	0.1875"	7.63	0.250"	7.63	0.1875"	7.63	0.75	6547	9,968	(8) 3/4"	84,000
76	14	24	0.115"	4.7	0.158"	6.4	0.115"	4.7	0.75	6670	21,648	0	0
77	14	24	0.115"	4.7	0.158"	6.4	0.115"	4.7	1.167	6670	17,636	(8) 3/4"	84,000
AES1	10	19	0.1046"	4.37	0.1046"	4.37	0.120"	4.37	1.167	3295	8,998	(8) 3/4"	84,000
AES2	10	19	0.1046"	4.37	0.1046"	4.37	0.120"	4.37	1.167	3295	8,998	(8) 3/4"	84,000
AES3	10	19	0.1046"	4.37	0.1046"	4.37	0.120"	4.37	1.167	3295	8,998	(8) 3/4"	84,000
AES4	10	19	0.1046"	4.37	0.1046"	4.37	0.120"	4.37	1.167	3295	8,998	(8) 3/4"	84,000

Tank Weight = Tank Wall weight + Tank Bottom Weight + Tank Top Weight

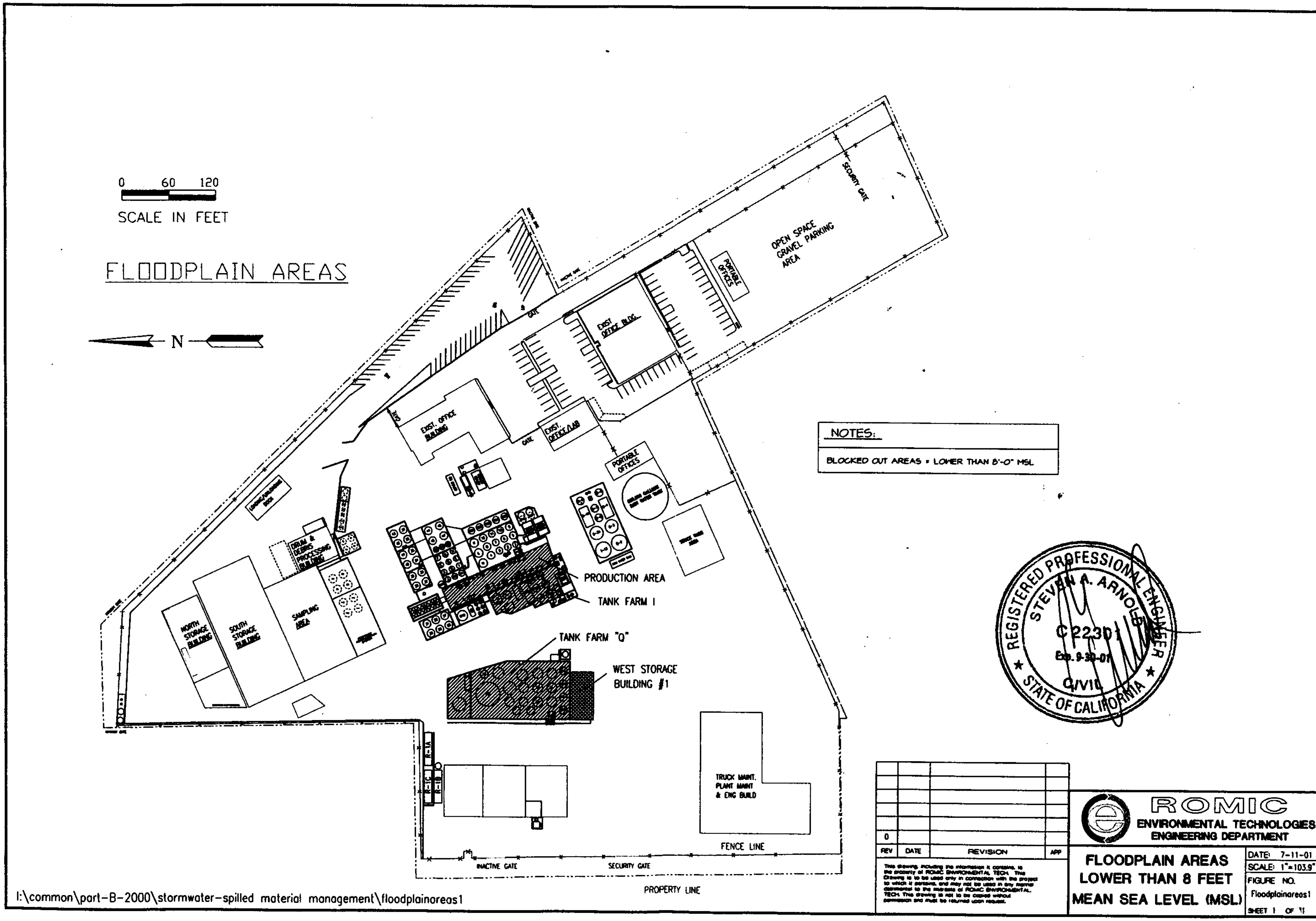
Tank Wall Weight = [pi] x [tank diameter (ft)] x [tank height (ft)] x [steel density in wall (lb/sq.ft.)]

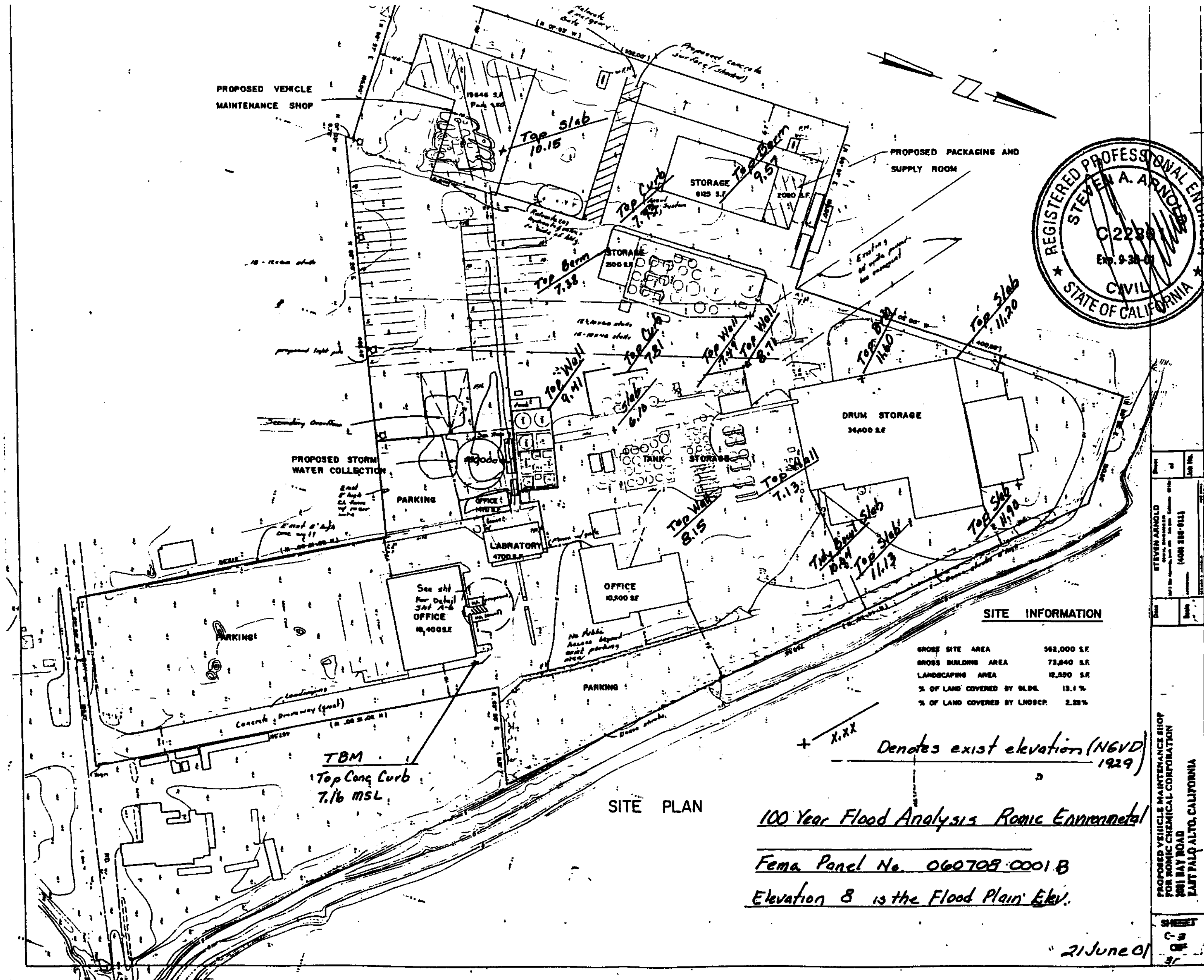
Tank Bottom Weight = {[pi] x [tank diameter (ft)]^2}/4 x [steel density in bottom (lb/sq.ft.)]

Tank Top Weight ={[pi] x [tank diameter (ft)]^2}/4 x [steel density in top (lb/sq.ft.)]

Steel density = 4.7 lb/sq. ft. for 0.115" thickness; 6.44 lb/sq. ft. for 0.158" thickness; 6.8 lb/sq. ft. for 0.167" thickness; 9.7 lb/sq. ft. for 0.24" thickness

Buoyant Force = Weight of water displacement = {[pi] x [tank diameter (ft)}^2}/4 x [height of water (ft)] x [density of water (lb/cu.ft.)]


0 60 120
SCALE IN FEET
FLOODPLAIN AREAS
N
OPEN SPACE GRAVEL PARKING AREA
SECURITY GATE
PORTABLE OFFICES
EXIST. OFFICE BLDG.
EXIST. OFFICE BUILDING
EXIST. OFFICE/LAB
GATE
PRODUCTION AREA
TANK FARM I
TANK FARM "O"
WEST STORAGE BUILDING #1
DRUM & DEBRIS PROCESSING BUILDING
NORTH STORAGE BUILDING
SOUTH STORAGE BUILDING
SAMPLING AREA
TRUCK MAINT. PLANT MAINT & ENG BUILD
FENCE LINE
INACTIVE GATE
SECURITY GATE
PROPERTY LINE
NOTES:
BLOCKED OUT AREAS = LOWER THAN 8'-0" MSL
REGISTERED PROFESSIONAL ENGINEER
STEVEN A. ARNOLD
C 22301
Exp. 9-30-01
CIVIL
STATE OF CALIFORNIA
0
REV DATE REVISION APP
ROMIC
ENVIRONMENTAL TECHNOLOGIES
ENGINEERING DEPARTMENT
FLOODPLAIN AREAS
LOWER THAN 8 FEET
MEAN SEA LEVEL (MSL)
DATE: 7-11-01
SCALE: 1"=103.9'
FIGURE NO.
Floodplainareas1
SHEET 1 OF 1
I:\common\part-B-2000\stormwater-spilled material management\floodplainareas1


PROPOSED VEHICLE MAINTENANCE SHOP
PROPOSED PACKAGING AND SUPPLY ROOM
Top Slab 10.15
STORAGE 6125 S.F.
Top Berm 9.57
Top Curb 7.92
Proposed concrete surface (shaded)
STORAGE 2500 S.F.
Top Berm 7.38
Top Curb 7.81
Top Wall 9.41
Top Wall 7.94
Top Wall 8.78
Top Berm 11.60
Top Slab 11.20
Slab 6.18
DRUM STORAGE 36,400 S.F.
TANK STORAGE
Top Wall 7.13
Top Wall 8.15
Top Slab 11.90
Top Slab 11.13
PROPOSED STORM WATER COLLECTION
PARKING
OFFICE
LABORATORY 4700 S.F.
OFFICE 10,500 SF
See sht For Detail Sht A-6
OFFICE 18,400 S.F.
PARKING
Concrete Driveway (good)
TBM
Top Conc Curb
7.16 MSL
SITE PLAN
SITE INFORMATION
GROSS SITE AREA 562,000 S.F.
GROSS BUILDING AREA 73,840 S.F.
LANDSCAPING AREA 12,500 S.F.
% OF LAND COVERED BY BLDG. 13.1 %
% OF LAND COVERED BY LNDSCP. 2.23%
+ X.XX Denotes exist elevation (NGVD 1929)
100 Year Flood Analysis Romic Environmental
Fema Panel No. 060708 0001 B
Elevation 8 is the Flood Plain Elev.
21 June 01
REGISTERED PROFESSIONAL ENGINEER
STEVEN A. ARNOLD
C22801
CIVIL
STATE OF CALIFORNIA
STEVEN ARNOLD
(408) 288-9111
PROPOSED VEHICLE MAINTENANCE SHOP FOR ROMIC CHEMICAL CORPORATION
2081 BAY ROAD
EAST PALO ALTO, CALIFORNIA
SHEET C-3

APPENDIX B-2

ENVIRONMENTAL PERMITS

Environmental Permits

EPA Hazardous Waste Facility Permit	CAD009452657
DTSC Hazardous Waste Facility Permit	CAD009452657
Bay Area Air Quality Management District (BAAQMD) Air Permits (numerous sources)	Plant No. 468
East Palo Alto Sanitary District Industrial Waste Water Discharge Permit	1107
East Palo Alto Sanitary District Groundwater Discharge Permit	11251
NPDES Permit To Discharge Treated Groundwater	CAG912003
DTSC Hazardous Waste Transporter Registration	160
Highway Patrol Hazardous Material Transportation License	CA-1099
US Department of Transportation Hazardous Materials Certification of Registration	060101002044J

APPENDIX B-3

LEGAL PROPERTY DESCRIPTION

Appendix B-3

Recorded Deeds

Assessor's Parcel Number	Recorder's Serial Number
063-121-070-5	60059AL
063-121-390-7	84006079
063-121-510-1	96096378
063-121-500-1	93006245
063-121-110-9	86161200
063-121-160-4	87106712
063-121-170-3	87106712

DISCLAIMER

Appendix B-3 of volume 2 of the permit application is the legal description of the facility. Appendix B-3 also contains the grant deeds for Romic which have been scanned. Due to the large size of this file (41MB), it has not been included in the web posting. For a copy of this file, contact Wei-Wei Chui at (510) 540-3975."