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Waste Management of Ohio, Inc.

WASTE MANAGEMENT

APPENDIX 1

RCRA WASTE ANALYSIS PLAN

4/15/99

VICKERY FACILITY

RCRA WASTE ANALYSIS PLAN

3956 State Route 412
Vickery, Ohio 43464

WASTE ANALYSIS PLAN

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1.0 INTRODUCTION

In accordance with the regulatory requirements set forth in 40 CFR Part 264.13 and OAC 3745-54-13, The Vickery Facility (Vickery) has developed this Waste Analysis Plan (WAP) for its facility located in Vickery, Sandusky County, Ohio. The Vickery Facility is designed to receive waste from many industries. Material which can be deepwell injected are treated (blended, pH adjusted, filtered, etc.) and deepwell injected. The procedures set forth in this plan dictate that this facility is in compliance with all requirements of 40 CFR Part 264.13 and OAC 3745-54-13. A copy of this plan or the current approved Waste Analysis Plan is available at the facility at all times.

The purpose of this WAP is to document the necessary sampling methodologies, analytical techniques and overall procedures which are undertaken for all hazardous waste (hereinafter "waste") which enters this facility for treatment, storage or disposal. Specifically, the plan delineates the following:

- Sampling Procedures that are used to obtain samples of incoming shipments and injection fluids in order to perform the appropriate analyses needed to identify a waste shipment or injection fluid (see Section 2 and Appendix WAP-D).

- Analytical Parameters and Rationale and the test methods that Vickery utilizes, when necessary, to determine or identify certain waste properties to ensure proper management of the waste (see Section 3 and Appendix WAP-A, Analytical Procedures).

- Pre-Acceptance Procedures utilized to determine the

acceptability of a particular waste stream, pursuant to facility permit conditions and operating capabilities, prior to acceptance of that waste by the facility (See Section 4 and Appendix WAP-C, Facility Acceptance Conditions.)

- Incoming Waste Shipment Procedures utilized to identify that the delivered waste matches the accompanying manifest, pre-acceptance documentation, and facility permit conditions (see Section 5).

- Quality Assurance and Control Policy that the facility laboratory follows to achieve quality analytical results and adequate laboratory controls (see Section 7).

- Process/Operation Procedures to maintain safe and environmentally sound methods of treatment, storage, disposal or movement of wastes within the facility (see Section 6).

It is the policy of Vickery that all wastes received by this facility are subjected to these procedures. This is to help ensure that this facility is in compliance with applicable state and federal regulations and permits.

For the purpose of sampling or testing, Vickery means the Vickery laboratory, all company laboratories, all company subsidiary laboratories and contract laboratory used by Vickery. The Laboratory, Technical, Environmental, Operations and/or General Manager or their designees, may hereinafter, be referred to individually or collectively as the Laboratory, Technical, Environmental, Operations and/or General Manager, or "Facility Management".

2.0 SAMPLING METHODOLOGY

Sampling may be performed by the generator at the generator's location to make an initial waste determination. Specific sampling procedures are dependent on both the nature of the material and type of containment. Waste generators are referred to 40 CFR 261, Appendix I, for sampling procedures. Sampling is also performed by Vickery personnel at the facility to identify waste shipments. This section presents sampling methodologies to be utilized by Vickery personnel.

When a waste shipment arrives at the facility for management, a determination has already been made by the generator that the waste is as follows:

- A listed hazardous waste in Subpart D of 40 CFR Part 261 and/or OAC 3745-51-30; and/or
- A characteristic waste as defined in Subpart C of 40 CFR Part 261 and/or OAC 3745-51-20; and/or
- A recyclable hazardous waste, as defined by 40 CFR Part 261.6; and/or
- A solid waste which is not a hazardous waste as defined in 40 CFR Part 261.4(b), and/or OAC 3745-51-04(B).

This characterization, a waste profile, provides Vickery with information concerning the distribution, as well as the nature of the waste components. (See Section 4.1 for a discussion regarding the information and/or data to be supplied by the generator.) Therefore, as described in EPA document SW-846, Vickery can appropriately use a less comprehensive sampling approach than that

used by the generator to initially characterize the waste (for example, vertical compositing to yield a representative sample).

Upon arrival, the shipment of waste is sampled and analyzed to ensure that it matches the overall identity of the waste designated on the accompanying manifest or shipping paper and the pre-acceptance paperwork. The analysis will also help to ensure the appropriate management technique(s) can be utilized. Quality control procedures for sampling and analysis are described in Section 7.0.

2.1 Sampling Techniques

The sampling methodologies described in the Waste Analysis Plan represent the recommended facility's sampling protocol. Certain waste materials will require deviations from these protocols. When deviations are necessary to sample materials which cannot be sampled using the recommended protocol (for example, debris, extremely hard materials, or other high shear force materials), the facility will obtain a representative sample, based on the circumstances preventing a vertical section, knowledge of the waste, and the container size and shape. For example, debris and like material will be sampled with scissors, tongs, hammer and/or chisel. Adhesives or other highly elastic substances will be sampled with a scoop or shovel and scissors or tongs. Resins and other extremely hard materials will be sampled with a hammer and a chisel. Therefore, deviations from the recommended protocol do not constitute an excursion from acceptable sampling practices or the conditions of this Waste Analysis Plan.

Procedures and equipment may be updated and revised as new equipment or procedures become available. In general, the equipment utilized corresponds to those referenced in 40 CFR 261, Appendix I, or OAC 3745-51, Appendix I,. The sampling methods and

the equipment used for different materials are presented in Figure 2-1 of Appendix WAP-B along with drawings and descriptions of the listed sampling devices in Appendix WAP-D. Dimensions of equipment identified in Attachment WAP-D are typical and will be adjusted as necessary to ensure a full vertical section.

2.2 Types of Containers

In addition to American Society for Testing and Materials (ASTM) and SW-846 sampling procedures, Vickery has instituted specific methodologies for ensuring that samples taken from various types of containments are representative. The type of containment may be transportable such as drums, portable transport units (for example, portable tanks, roll-off boxes, lugger boxes, supersacks) and tanker trucks; or stationary, such as tanks, impoundments, and in-process sources. The sampling devices are selected depending on the size and type of the containment and on the specific waste material involved.

2.2.1 Containers and Tanks

Sampling of containers (drums, pails, and other small units) varies with the nature of the waste material. For flowable materials, the sampling device of choice is either a Coliwasa or tubing to draw a full vertical section. For non-flowable wastes, a scoop, tubing, trier or other equipment, as listed in Figure 2-1, is used to obtain a representative sample.

Large containments and tanks for flowable materials and bulk containments for solid materials may be either stationary or mobile. Liquids are sampled with a Coliwasa or tubing to obtain a vertical section, by a weighted bottle or bomb sampler to allow for sampling at various depths, or along the outside or from influent or discharge lines through sampling taps or valves. Light, dry

powders and granules are sampled with a tube or other equipment, as listed in Figure 2-1, through ports or from the top. Heavier solids are sampled by scoop, shovel, trier, auger, coring with heavy tubing or by other equipment as listed in Figure 2-1. Tank sediments are sampled from a bottom sampling valve when not readily sampled from above.

2.3 Process In-Line Sampling

The variability of the waste stream at any point in a waste treatment process is first determined from knowledge of the process producing the stream, or from the results of a preliminary investigation of the waste variability. The sampling procedures consists of obtaining individual samples from appropriate in-line sampling points in the process stream and compositing them as necessary for analysis. These sampling points include valves in circulation and transfer lines or ports on tanks. For compatibility analysis purposes, samples are taken from the applicable tank recirculation lines.

The sampling device can be varied in size depending on the flow rate of the stream. For solid or semi-solid streams samples are taken from a conveyor or pile using a scoop, shovel or similar device.

3.0 ANALYTICAL RATIONALE

The usage and applicability of analyses are described herein. The analytical techniques given in this text and listed in Appendix WAP-A, whether standard procedures or those developed by Vickery through its operating experience, have been chosen for their ability to identify waste and to provide the information required to properly and safely manage wastes. Analyses are not necessarily repeated for sequential activities or movement of the same waste

within the facility.

Analytical methods are classified as either "Mandatory Analyses" and "Supplemental Analyses." All waste samples are subjected to the mandatory analyses as a first step in the analytical scheme. Supplemental analyses may be performed to obtain information required for efficient process control or to further evaluate a positive result from a mandatory screening test (e.g., a flash point may be run to provide more specific waste data when a positive flammability potential is reported during the mandatory analysis testing). This arrangement allows a tiered approach to waste identification, enabling Vickery to structure the analyses to adequately identify the waste or to define operational parameters for proper management.

Analyses, if required, may be performed prior to or after arrival of the waste at the facility. Most analyses utilize standard analytical techniques which are commonly used. Other analyses are unique tests that have been developed by Vickery and meet Vickery performance standards. These procedures and protocols have been formulated by Vickery through its operating experience and are found to be preferable for waste identification or they may be used in the absence of standard techniques. The parameters which constitute the mandatory and supplemental analyses and their rationales are listed below. A description of the analytical methods which may be used to determine these parameters can be found in Appendix WAP-A.

3.1 Mandatory Analyses

Mandatory analyses include screening procedures that are used to indicate the type of treatment, storage and disposal that is most suitable for that particular waste and to identify incoming waste shipments. These are analytical procedures designed to

identify or screen a specific waste and are a rapid but effective means for establishing key decision parameters pertinent to proper waste management and identification.

The parameters and associated rationale of the mandatory analyses, as shown in Figure 3-1, are as follows:

- Physical Description is used to determine the general physical properties of the waste. This facilitates subjective comparison of the sampled waste with prior waste descriptions or samples. It is used to identify any obvious changes in the waste's physical properties (type).

- pH Screen is undertaken to indicate the pH and general corrosive nature of the waste. pH may not apply to certain special wastes, (e.g., organic solvents, oily waste, or insoluble solid waste).

- Specific Gravity is run to determine the density of the waste compared to that of water as an identifying characteristic. This is also used to determine the amount of waste received by inserting the result into the calculation conversion from gallons to pounds.

- Liquid Waste Compatibility is used to determine whether there is a potential to vigorously react with the tank contents that the waste will be unloaded or blended with, to form gases, other products, and/or generate significant heat.

- Flammability Potential Screening is used to indicate the fire producing potential of the waste. This test can be

applied to all waste liquids, semi-solids or solids. This is used to identify any obvious changes in the waste type or properties such as a waste solvent substituted for a waste acid.

- Cyanide Screening is used to indicate whether the waste has the potential to release hydrogen cyanide gas upon acidification. The screen is not required if the pH is less than five (5) pH units, if the waste is not water soluble or if the waste is non-aqueous.

- Sulfide Screening is used to indicate whether the waste has the potential to release hydrogen sulfide gas upon acidification. The screen is not required if the pH is less than five (5) pH units, if the waste is not water soluble or if the waste is non-aqueous.

- (VOC) Solvent Screening Volatile Organic Constituent analysis is used to determine whether special handling is required. It is not required if:

  -- The Generator Waste Profile Sheet indicates the volatile organic constituent concentration is less than or equal to five (5) percent; or

  -- The Total Organic Carbon content of the representative sample is less than or equal to five (5) percent; or

  -- The process generating the waste does not use or generate volatile organic constituents greater than five (5) percent, such as steel pickling, metal plating, or inorganic chemical production; or

-- Analysis of a pre-acceptance sample indicates the volatile organic constituent concentration is less than five (5) percent.

- Radioactivity Screen is used to ensure that no radioactive materials above background are present in the waste.

- PCB Screening is applicable when representative phases, such as, oil bearing waste, aqueous solvents, settled solids, suspended solids, etc., are analyzed according to the rationale outlined below in Section 3.1.1.

3.1.1 PCB Analysis

No waste is accepted or off-loaded for treatment, storage and disposal at the Vickery facility unless the Pre-Acceptance Procedures (described in Section 4) and the following steps have been completed:

1. The generator submits to Vickery either the concentration or the absence of detection of PCB's for the waste stream. If no PCB information is given, Vickery will obtain PCB data. If information indicates PCB concentration less than or equal to 10 ppm, the waste stream qualifies for reduced PCB analysis frequency. No waste stream is approved for acceptance at the Vickery facility if the waste profile or Vickery's analysis of a representative sample (or a phase of the sample) indicates the presence of PCB's in a concentration of over 25 ppm.

2. Vickery performs incoming receipt analysis including PCB analysis of a representative sample from the particular

shipment of the waste stream presented for acceptance at the facility. This fingerprint analysis is designed to assure the shipment is the waste stream indicated.

Vickery maintains a list comprised of streams which are believed to have no potential for PCB contamination. This list is called the "Reduced PCB Analysis Frequency" list. Except for waste streams qualified for "Reduced PCB Analysis Frequency," 100% of loads are analyzed for PCBs.

Reduced PCB Analysis Frequency is conducted as follows. The incoming receipt analysis of the first 10 shipments includes PCB analysis. At least 10% (1 in 10 loads) of the subsequent shipments of those waste streams includes PCB analysis. If any incoming receipt analysis indicates the presence of PCB's in excess of 10 ppm, the stream is deleted from the "Reduced PCB Analysis Frequency" list. All receipts found exceeding 25 ppm PCBs are rejected.

3. Any waste from the following sources is not eligible for the "Reduced PCB Analysis Frequency" list:

   1. Waste Brokers
   2. Electrical Utility Companies
   3. Solvent Recovery, Reuse or Recycling Units
   4. Oil Recovery, Reuse or Recycling Units
   5. Natural Gas Pipeline Transmission Companies
   6. Oil Maintenance Centers
   7. Pond Closures
   8. Remedial Action Superfund Sites*
   9. RCRA Corrective Action Projects*
   10. Timber/Lumber Treating Facilities

11. Hydraulic Equipment
12. Remedial Action Projects*

* Unless demonstrated non-TSCA

4. Before each load is considered for acceptance without PCB analysis, Vickery obtains information from the transporter regarding the contents of the last load contained in the tanker prior to the load being received at the Vickery Facility. If the last load was from a generator who would not likely qualify for the Reduced list, and testing was not performed to confirm the absence of PCB's in the last load, a PCB analysis is run on the current load prior to acceptance. If no information can be obtained on the last load, PCB analysis is run on the current load prior to acceptance. NOTE: If the truck was washed/cleaned before picking up the current load, the current load may be considered for acceptance without PCB analysis.

5. If a PCB analysis is required and the representative sample contains a visible layer of solids over 5% of volume, visible oil (1% by volume), or an oily appearing phase of 1% by volume, Vickery shall first analyze for PCB in the composite sample. If the presence of PCBs is detected, Each phase will then be analyzed. Solids content and oil content will be determined by centrifuging a portion of the representative sample. Total PCB's in the waste is calculated to represent all the visible phases analyzed as aqueous, solid and oil PCB contents in ratio perspective for the entire sample.

[(% Phase of Sample)/(100) x (ppm PCB's in Phase)] = [(Total PCB's in Phase)]

[(Solid Phase) + (Aqueous Phase) + (Oil Phase)] = [(Total PCB's in sample)]

6. All PCB analyses may be done on a composite of samples. A maximum of 10 receipts are composited, extracted and analyzed. A 100 milliliter sample is taken from each receipt. If the analysis indicates that a single shipment in the composite could exceed 25 ppm PCBs, each shipment in the composite is individually analyzed to determine which shipment(s) contain PCBs.

   If the analysis indicates the level of PCBs exceeds 1 ppm for landfill leachate or 10 ppm for all other single shipments a decision is made whether to further analyze these loads.

7. For railcar shipments, the railcar is sampled and analyzed as required by Section 5.1. PCB analysis on the railcar sample would be performed as required by Section 3.1.1. Each tanker load would not require PCB analysis as long as Vickery obtains information from the transporter regarding the contents of the last load contained in the tanker prior to the load being received at the Vickery Facility. If the last load was from a generator who would not likely qualify for the Reduced list, and testing was not performed to confirm the absence of PCB's in the last load, a PCB analysis is run on the current load prior to acceptance. If no information can be obtained on the last load, PCB analysis is run on the current load prior to acceptance. NOTE: If the truck was washed/cleaned before picking up the current load, the current load may be considered for acceptance without PCB analysis.

3.2 Supplemental Analysis

"Supplemental Analysis" are performed during pre-acceptance testing or during testing of incoming shipments to further identify wastes or ensure the proper waste management technique can be utilized. The results of these analyses provide another level of confidence concerning the proper means of treatment, storage and disposal. Some of these additional supplemental analyzes utilize unique procedures and protocol formulated by Vickery, which have been developed in the absence of standard procedures through Vickery's operating experience. Other analyses utilize standard analytical techniques recognized by the USEPA, the ASTM, or equivalent organizations (i.e., AOAC, etc.).

The basis of requiring these additional supplemental analyses are:

- Facility management's knowledge, experience and judgment.
- WPS or other description of the chemical and physical properties of the waste.
- WPS or other description of the process generating the waste.
- Results of the "Mandatory Analyses" obtained.
- Potential waste management technique.

The parameters and associated rationale of the supplemental analyses are listed below. Analytical procedures can be found in Appendix WAP-A:

- Timed Filtration allows the Vickery laboratory to quickly ascertain the filter loadings caused by suspended solids in the wastes and gain a rough approximation of potential filtering.

- Process Blend Testing (TWO Test) is done to discover other wastes or waste blends with which the waste (or blend) can be mixed to yield an injectable mixture. The testing is also done to discover any problems that could result in adding a waste or blend to existing tank contents. The testing can also be used to determine proper spacer fluids to be used during injection of otherwise nonblendable wastes. This test is also used to evaluate the potential of a new stream to cause post blending and filtration reactions.

- pH Spectrum is to determine the phase behavior of the waste over a wide pH change, and is particularly applicable to blending and filtration.

- Solvent Screen is used to separate and identify organic compounds and also to determine whether waste contains Land Disposal Restricted organic constituents.

- Process Testing is conducted to determine if new pretreatment will be required to inject a new waste. This testing will only be done under particular circumstances when preacceptance testing indicates that existing treatment would be inadequate.

- Total Organic Carbon measures the total organic content of a solution.

- Specific Conductance is a reading of the ionic activity and mineral concentration of a solution.

- Percent Acidity determines the acid content in the waste by species or as $CaCO_3$. It is only used if the waste is aqueous and below a pH of 7.

- Heavy Metals (e.g., Ag, As, Ba, Cd, Cr, Pb, Hg, Se, etc.) are run to quantify heavy metals concentration .

- Miscellaneous Metals (e.g., Cu, Fe, Ni, Zn, etc.) determines potential salt precipitation and is used for monitoring certain processes.

- pH provides a more precise measurement of pH and an indication of corrosivity when determining process parameters.

- Sulfates determines the concentration of sulfates in materials. It is used in determining processing and/or disposal.

- Toxicity Characteristics Leaching Procedure (TCLP) determines whether a treated waste residue (or a waste stream) contains levels of restricted constituents above appropriate treatment standards.

- Chlorides determines the concentration of chlorides in materials. It is used in determining processing and/or disposal.

- Nitrates determines the concentration of nitrates in materials. It is used in determining processing and/or

disposal.

- Percent Alkalinity determines the alkaline content in the waste by species or as $CaCO_3$. It is only used if the waste is aqueous and above a pH of 7.

- Total Sulfides determines complex sulfides the concentration of sulfides in materials. It is used in determining processing and/or disposal.

- Fluorides determines the concentration of fluorides in materials. It is used in determining processing and/or disposal.

- Total Solids quantifies the suspended and dissolved solids present and moisture content for selected processes and disposal.

- Dissolved Solids quantifies the dissolved solids present in a material. It is used in determining processing and/or disposal.

- Suspended Solids quantifies the suspended solids present in a material. It is used in determining processing and/or disposal.

- Viscosity determines the waste pumpability. Also used to determine waste mixing properties.

- Total Cyanides quantifies the concentration of all free and most complexed cyanides in a waste material. It is used in determining processing and/or disposal.

- Amenable Cyanides quantifies the concentration of all free cyanides in a waste material. It is used in determining processing and/or disposal.

- Total Phenols quantifies the concentration of phenols in a waste material. It is used in determining processing and/or disposal.

- Flash Point further identifies ignitable wastes to establish proper storage mode and conformance with permit conditions.

- Oil and Grease quantifies the concentration of oil and grease in a waste material. It is used in determining processing and/or disposal.

- GC Scan indicates the concentrations of specific organics. It is used in determining processing and/or disposal.

4.0 PRE-ACCEPTANCE PROCEDURES

Vickery has developed a series of control procedures to determine the acceptability of specific wastes for receipt at the facility. These control procedures are referred to as the pre-acceptance procedures. The pre-acceptance procedure dictates what information a potential customer must provide to enable Vickery to determine the acceptability of the waste for treatment, storage, or disposal. At a minimum, the information required by 40 CFR Part 264.13(a)(1) [Ref: 40 CFR Part 264.13(a)(2) and comment] and OAC 3745-54-13(A)(1) [Ref: OAC 3745-54-13(A)(2) and comment] will be obtained for evaluation.

Pre-acceptance control is the mechanism for deciding to reject

or accept a particular type of waste prior to its acceptance at the facility based on the conditions or limitations of existing regulations and permits, and its compatibility with other wastes being treated, stored or disposed at the facility.

4.1 Procedural Requirements

For each new waste stream that is a candidate for acceptance at the facility, the following procedures are implemented.

Vickery will obtain:

(1) Pertinent chemical and physical data on the Waste Profile Sheet (WPS). The waste profile sheet will include the following information: Generator name, address, phone number, EPA ID# (if applicable), contact person, waste name, process generating waste, EPA waste number(s) (if applicable), physical state, pH, flash point and chemical composition ranges;

(2) A representative sample, if required; (a representative sample may not be required by Vickery if facility management determines that the pre-acceptance documentation obtained gives sufficient information to maintain compliance with permit and operational constraints and that submittal of a sample for analysis would not aid in the decision process.);

(3) Land Disposal Restriction (LDR) Notification/Certification Information and/or data (40 CFR Part 268.7 and OAC 3745-59-07).

(4) Other supporting documentation including any information

such as additional analytical results, material safety data sheets, product ingredients, etc.

Vickery may perform the mandatory analyses on the pre-acceptance waste sample(s), if obtained. Parameters are determined as outlined in Section 3.0 using methods designated in Appendix WAP-A.

Based upon the results of the mandatory analyses and an initial review of the waste profile, certain supplemental analyses may be performed to ensure that the proper management techniques are utilized.

After evaluating the data obtained on the waste profile and that obtained from mandatory and supplemental analyses if performed, Vickery will determine the acceptability of the waste based on the following criteria:

(1) Applicable regulations and the permit conditions for the facility,

(2) The availability of the proper waste management techniques, and

(3) The available capacity at the facility.

4.1.1 Standard Profiles

Standard profiles may be used for waste streams which are similar in physical and chemical characteristics, generated by similar industries or processes, consistent with the USEPA approach of assigning a listed waste code to similar process wastes.

An analytical database is developed for a specific standard

profile based on analytical data from waste streams that are representative of wastes from similar industries or processes or based on historical data. The database will be reviewed and it will be determined whether the individual waste streams are sufficiently similar in physical and chemical characteristics to an established a standard profile. The analytical database developed as discussed replaces the pre-acceptance sample for each applicable waste stream.

Specific candidate waste streams which upon review, are identified as conforming to an existing approved standard profile will be managed under the existing decision specific for that standard profile.

4.2 Evaluation

Pre-acceptance information is evaluated and a decision is made to approve or not approve the wastestream. Figure 4-1 presents a general logic diagram of the preacceptance process.

The pre-acceptance evaluation and decision logic are based on the following:

- Management methods available.
- Conditions or limitations of existing permits and regulations.
- Capability to manage the waste in a safe and environmentally sound manner.
- Waste profile description of the waste.

- Any additional documentation supplied by the generator. See Section 4.1 for further discussion.

- Results of mandatory and supplemental analyses.

- The facility's technical knowledge, experience and judgment.

The pre-acceptance evaluation process is concluded with the documentation of the decision to manage the waste.

4.3 Waste Profile Re-evaluation

In accordance with 40 CFR Part 264.13 and OAC 3745-54-13, a waste profile re-evaluation will be conducted when one of the following occurs:

- A generator notifies Vickery that the process generating the waste has changed; or

- The results of inspection or analysis indicate that the waste received at the facility does not match the identity of the waste designated on the accompanying manifest or shipping paper or pre-acceptance documentation, in which case the procedure in Section 5.2 is followed.

When this occurs Vickery will review the available information, if existing analytical is not sufficient. The generator may be asked to review the current waste profile, to supply a new profile or analysis, and/or to submit a sample for analysis, or Vickery may obtain a sample from a load of the waste.

5.0 INCOMING WASTE SHIPMENT PROCEDURES

Each shipment of waste is inspected, sampled and analyzed as defined herein before the initiation of any further activity. This serves two purposes. First, it compares the results of incoming waste shipment mandatory analyses with the pre-acceptance phase waste profile and the waste identity listed on the manifest or shipping papers. Secondly, it further ensures the proper disposition of the waste. In addition, all wastes which are subject to the Land Disposal Restrictions of 40 CFR Part 268 and have been treated, exempted, or varianced, or meet the appropriate treatment standard or prohibition without treatment, must be accompanied by a form from the treater or generator certifying that the treated, exempted, or varianced waste (or that the untreated waste naturally meeting the treatment standard or prohibition) meets the appropriate treatment standard or prohibition and includes the applicable analytical data or reference to that data or documentation (in accordance with 40 CFR Part 268.7).

Furthermore, all materials which are subject to the Land Disposal Restrictions of 40 CFR Part 268 and require treatment must be accompanied by a form from the generator notifying the treater of appropriate treatment standards and/or all applicable prohibitions which must be met and includes any applicable analytical data or reference to such data or documentation (in accordance with 40 CFR 268.7).

5.1 Receiving Procedures

Incoming load identification begins upon arrival of the waste at the facility. The inspection, sampling and analysis of the incoming waste shipment will be performed in accordance with the methods and parameters described in this WAP. Site personnel or other Vickery personnel can provide the sampling and mandatory

and/or supplemental analysis required prior to, or in conjunction with, arrival of a shipment onsite. Waste shipments that have arrived at the facility are considered to be in the receiving process until the laboratory or facility management makes a final decision regarding waste acceptability.

All bulk liquid waste deliveries are sampled and analyzed, with the exception of tank truck loads from the Toledo Transfer Facility. Each rail car is presampled at the Toledo Transfer Facility, DOT packaged and transported to the Vickery facility to be analyzed. All tanker truck transfer shipments from the individual rail cars need not be resampled except to provide the analysis necessary to safely manage the load in the facility's tank system. All tanker truck transfer shipments are subject to chain-of-custody procedures. Samples from incoming waste shipments are subject to the "Mandatory Analyses" identified in Section 3.1.

5.2 Decision Evaluation Logic

The technical evaluation logic utilized in deciding whether to accept or reject a particular waste shipment is depicted in Figure 5-1. As outlined in Figure 5-1, there are specific major decision points. They are:

- The need for additional supplemental analyses
- The actual waste identification
- An evaluation of whether a waste conforms to the waste profile, and
- An evaluation of whether a waste found to be in "non-conformance" can still be accepted.

(1) <u>The need for additional supplemental analyses</u>

Decisions about whether additional supplemental analyses are required for a particular waste are based on the following:

- Results of mandatory analyses;
- Knowledge of generator and/or waste-generating process;
- Results of pre-acceptance evaluation;
- Experience and judgment in determining that more information is needed in order to properly identify an incoming waste shipment or to ensure the appropriate management technique can be utilized.

Further testing is required if the results indicate unexpected information when compared to the waste profile or there is a reason to suspect that the waste composition has changed.

(2) <u>The actual waste identification</u>

The effectiveness of the waste identification step is dependent on the following components:

- Inspection;
- Sampling;
- Analytical results;
- Waste profile sheet;
- Waste manifest;

- Any additional documentation supplied by the generator such as MSDS forms, material ingredients, etc;

- Pre-acceptance analytical results, if required;

- Facility judgment; and

- Appropriate land disposal restriction notification and/or certification forms (see section 5.0).

(3) Evaluation of whether a waste is in conformance or non-conformance

The facility management must classify the waste as being in "non-conformance" if it is significantly different in composition from the information shown in the WPS, the pre-acceptance information, or the identity and volume on the manifest, in accordance with 40 CFR Part 264.72 and OAC 3745-54-72. Three major criteria are used to arrive at this decision. They are:

- If the amount of bulk waste varies more than 10 percent in volume.

- If, in batch wastes (e.g., drums, bags, roll-off boxes, etc.), there is any variation in piece count. That is, the number of pieces listed on the manifest does not agree with the number of pieces on the truck when received.

- If inspection or analysis of any waste reveals obvious differences in waste type, such as acid substituted for a solvent or a toxic constituent not reported on the manifest or shipping paper.

Manifest discrepancies or non-conformances that do not fall within these criteria are considered to be "minor". If Vickery has reason to believe that a minor discrepancy is not a one-time variation and that a particular waste is different from its documented values, the shipment will be classified as non-conforming.

(4) Evaluation if waste found to be in non-conformance can be accepted

Wastes found to be non-conformance may be rejected out-of-hand, or they may be re-evaluated for possible acceptance by the facility. This procedure is intended to prevent the unnecessary movement of a waste material back and forth between the facility and the generator, when the material can be readily handled by the facility. Vickery is attempting to reduce the possible exposure of human health or the environment to this waste by eliminating the unnecessary movement of the waste in public commerce.

The re-evaluation will be based on the following criteria:

- Permit conditions and current regulations;
- Discussions with the generator;
- Need for any additional supplemental analyses;
- Facility ability to handle the material in a safe and environmentally sound manner; and
- Facility judgment.

In addition to the Vickery evaluation and pursuant to 40 CFR

Part 264.72 and/or OAC 3745-54-72, Vickery discusses and attempts to resolve with the generator, any non-conformance between the actual waste shipment and that shown on the manifest. If the load is found to be acceptable at the facility, a decision process is initiated.

6.0 PROCESS OPERATIONS PROCEDURES

Each movement of a waste within the facility, during which any change in its characteristics may occur, makes it subject to additional inspection, sampling and analysis to determine appropriate handling and management of the waste. Many of the analyses needed for the treatment, storage and disposal functions are performed during incoming load analysis and are found on the waste profile. These are not repeated unless it is known or believed that the waste characteristics may have changed during storage or processing.

Existing process operations at the facility, for which current and periodic sampling and analyses are important, include the following:

- Storage
- Treatment - Filtration
- Disposal - Deepwell Injection (See the UIC Waste Analysis Plan)

The analytical procedures for each of these processes is described separately below.

6.1 STORAGE

Once the facility has decided to accept a waste shipment, wastes are segregated with respect to hazardous compatibility. Wastes, which are transferred from portable tanks or tank trucks, are placed in bulk storage prior to further treatment. Before any wastes are placed in a storage unit, the facility assesses the hazardous compatibility of the waste with the storage unit materials of construction, as well as the treatment and disposal equipment materials of construction, and wastes already in storage. If there is any suspicion of incompatibility, additional compatibility testing is performed. The general analytical flow diagram is shown in Figure 6-1.

6.1.1 Nitric Acid Wastes

Following the acceptance of a nitric acid waste shipment, a millivolt potential assessment is preformed, determining the compatibility for the nitric acid stream to the storage tank.

Prior to blending nitrating acids, the liquid waste compatibility test is conducted and approval to blend must be obtained from the Laboratory Manager or Technical Manager or their acting designee. If an approval signature can not be obtained prior to blending, then verbal approval must be obtained and the following information entered on the waste compatibility sheet the statement, "approved as per..." and the date, time and initials of the contacted approving manager. The approving manager must sign the original Waste Compatibility Sheet on the next working day.

6.2 Treatment Operations

The proper and complete treatment of a particular waste depends upon appropriate sampling and analysis during selected phases of the operation. The results of this analytical program serve to determine safety constraints, confirm treatment method

selection, and identify processing. The treatment sampling and analysis program may be divided into three segments, each with a specific purpose:

- Pre-treatment analyses ensure that the waste is acceptable for processing and will allow the fine tuning of the process operational conditions for optimum treatment;

- In-process analyses are performed to monitor the treatment at various stages to determine acceptability for next stage of treatment.

- Post-treatment analyses confirm successful treatment and that the process effluent is ready for additional treatment and/or disposal, based upon permit or process constraints.

Residue(s) resulting from on-site treatment of Land Disposal Restricted wastes will be analyzed and/or evaluated, as needed against the appropriate treatment standard and/or prohibitions. Wastes or the residue from the treatment of land disposal restricted wastes that are sent off-site for further treatment (or disposal) will have appropriate notification and/or certification (in accordance with 40 CFR Part 268).

6.2.1 Filtration

In this process, liquid wastes with suspended solids are passed through a filter. This results in a filter cake and filtrate (effluent) with acceptably low suspended solids. The general analytical approach is shown in the Figure 6-2.

The feed to the filter must be evaluated with respect to the

content of suspended solids. Excessive solids concentrations may result in shortened filter runs, wetter filter cakes, and excessive solids in the effluent.

The following is checked regularly in order to monitor the operation:

- timed filtration

This provides an indication of the potential flow rate through the filtering operations.

Post-treatment analyses consist of those tests necessary to ensure that the filter cake and filtrate meet the required criteria for further treatment or direct disposal.

6.3 Final Disposal

A sampling and analysis program is an integral part of this phase of operation. The results of this program serve to evaluate compliance with site permits, confirm disposal method selections, and determine safety constraints.

6.3.1 Deepwell Injection:

In this disposal method, liquid wastes are pressure-injected down a deepwell into an isolated, porous stratum. Wastes are composited in tanks, pH adjusted and filtered, as necessary prior to injection. The major concern with deepwell injection is compatibility with and prevention of plugging of the well or receiving stratum. Pre-disposal analyses attempt to identify those wastes that would have the potential to cause solids precipitation or plugging problems, and to screen out those that cannot be injected until after additional treatment. Samples are taken of

all wastes prior to their compositing in batch tanks for this purpose. In-process analyses are performed on samples from the tank to check suitability for injection. When it is determined that the waste to be injected is fully compatible with the deepwell system, it is passed through a final filter and pressure injected down the well. For additional information related to testing for deepwell injection, see the UIC Waste Analysis Plan.

7.0 QUALITY ASSURANCE/QUALITY CONTROL

The following sampling and analytical quality assurance/quality control (QA/QC or "quality") information for this facility is being provided as required by 40 CFR Part 270.30(e). At minimum, Vickery will follow guidelines established in the following documents:

- *Handbook for Analytical Quality Control in Water and Wastewater Laboratories*, EPA 600/4-79-019, March 1979, U.S. Environmental Protection Agency (U.S. EPA), Environmental Monitoring and Support Laboratory (EMSL), Cincinnati, OH, March 1979 (available from EMSL, Cincinnati, OH 45268).

- *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, SW-846, Third Edition, Final Update I, U.S. EPA, Office of Solid Waste, Washington, DC, July 1992, Chapter One (available from Superintendent of Documents, Government Printing Office, Washington, DC 20402).

Quality procedures are applicable to both sampling procedures and analytical techniques. Quality information for these two elements has been included in this WAP.

This section does not provide specific performance standards of quality procedures for individual sampling and analysis techniques. Such specifics are defined on a corporate-wide basis for all company facilities. The specific performance standards are dynamic and are revised as warranted to reflect technological advances in sampling and analytical techniques. These performance standards are described in corporate policies, which are maintained and used at this facility and which are available for regulatory review. Portions of these policies have been summarized in the following sections.

7.1 Sampling Program

Sampling procedures for facility operations are described in Section 2 of the WAP. The selection of the sample collection device depends on the type of sample, the sample container, the sampling location and the nature and distribution of the waste components. In general, the methodologies used for specific materials correspond to those referenced in 40 CFR Part 261, Appendix I. The selection and use of the sampling device is supervised or performed by a person thoroughly familiar with the sampling requirements.

Sampling equipment is constructed of nonreactive materials such as glass, PVC plastic, aluminum, or stainless steel. Care is taken in the selection of the sampling device to prevent contamination of the sample and to ensure compatibility of materials. For example, glass bottles are not used to collect hydrofluoric acid wastes.

Individual container samples may be composited prior to analysis, provided that individual samples are compatible. (Samples are determined to be compatible if they can be mixed

together without causing a change of phase or excessive heat or reaction.)

7.2 Analytical Program

The company has developed a program of analytical quality practices and procedures to ensure that precision and accuracy are maintained throughout its laboratories. Company facility laboratories are required to participate in this program. Noncompany laboratories employed by the company demonstrate quality practices that are comparable to the company's program.

Good laboratory practices which encompass sampling, sample handling, housekeeping and safety are maintained at all laboratories.

7.3 Conclusion

The aforementioned sampling and analytical quality practices help ensure that the data obtained are precise and accurate for the waste stream being sampled. The analytical results are used by facility management to decide whether or not to accept a particular waste and, upon acceptance, to determine the appropriate method of treatment, storage, and disposal. Results are also important to ensure that wastes are managed properly by the facility and that incompatible wastes are not inadvertently combined. Just as these results are important so is the quality of these results. Thus, the quality of the analytical data, the thoroughness and care with which the sampling and analyses are performed and reported, provides an important basis for day-to-day operational decisions.

APPENDIX WAP-A

ANALYTICAL PROCEDURES

The following analytical procedures are designed to identify or screen waste. They are used by Vickery, based upon its operating experience, as rapid but effective means for establishing key decision parameters pertinent to proper waste management. Analytical procedures, not listed below, may be added as necessary and will be taken from the references listed at the end of this appendix or other recognized sources, for example, Association of Official Analytical Chemists (AOAC), or will be developed by Vickery and meet Vickery performance standards.

It should be noted that the information presented in this appendix is generic in character. Therefore, certain test methods are discussed which may pertain to treatment or disposal processes that are excluded from the facility for which the foregoing waste analysis plan is presented.

I. UNIQUE ANALYTICAL PROCEDURES

The following Vickery-developed analytical procedures have been found by Vickery to provide important information pertinent to certain processes. In some cases, these tests provide information not available from standard analytical procedures found in Section II, which follows. The methods described below are based on ASTM standards or standard procedures recognized by EPA or are based on procedures and protocol formulated by Vickery and meet Vickery performance standards. These tests provide important operational information.

Process Testing - Samples of process candidate wastes are combined with samples of other wastes, spacer fluids, filter aids or other reagents at predetermined ratios. Further testing may be required in order to confirm that no undesirable reaction has occurred.

Process Blend Test (TWO Test) - This bench-scale process test

determines compatibility between candidate wastes or waste blends, and determines the need for, and compatibility with, spacer fluids. Samples of wastes, waste blends, and/or spacer fluids are mixed in pre-determined ratios and subjected to specified shaking and heating regimes. The mixtures are observed for compatibility and unacceptable color changes, precipitate or emulsion formations, or phase separations. Promising mixtures may be further tested, as requested.

Timed Filtration - This bench-scale process test is conducted at ambient temperatures (1) to approximate the filtration that occurs naturally in the formation into which wastes may be injected or (2) to simulate alternative filtering processes and conditions to which a waste may be subjected prior to deepwell injection. The key parameter measured is the time required for filtering a specified quantity of sample under specified conditions. Other observations are made. These may include the formation of any emulsions, polymers, or precipitates during or following filtration and the color, odor, or other notable changes in the collected solids. The collected solids from this test may utilized for additional tests, if requested.

Organics Screen by Immunoassay - A portion of the waste sample is prepared for immunoassay by using appropriate separation procedures (e.g., extraction, filtration, and/or thin layer chromatography). The extract is then mixed and incubated in a step-wise process inside antibody-coated tubes. The mechanics of mixing, incubating and measuring takes about 30 minutes and results in a color change in each tube. The color development is inversely proportional to the concentration of the antibody-specific analyte(s) of interest, e.g., herbicides, pentachlorophenol (PCP), pesticides, polyaromatic hydrocarbons (PAHs), or total petroleum hydrocarbons (TPHs).

pH Spectrum - For this bench-scale process test, strong mineral acid is added to an aliquot of waste sample to adjust the pH to nearly 1. Then strong caustic is added to another aliquot to change the pH to near 14. During the pH change, waste behavior is noted with respect to production of solids, temperature change, and gas evolution.

Phenol Screen - After extraction and pH adjustment, the sample is mixed with reagents. Phenolic materials react with 4-aminoantipyrine in the presence of potassium ferricyanide at a pH of 10, to form a stable reddish-brown colored antipyrine dye. The generation of color indicates phenolics.

Radioactivity Screen - A sample of the material is passed by a geiger counter or survey meter. Radioactivity levels above background are noted, recorded and investigated.

Solvent Screen - Uses standard analytical procedures tailored to cover a range of organic compound types for quick screening of common industrial organics.

Volatile Organic Constituents - This is a modification of ASTM D5830-Solvents Analysis in Hazardous Waste using Gas Chromatograph, and is meant to be used for determining the compounds identified by OEPA and Vickery as volatile organic constituents. Waste samples are analyzed by direct injection, or by carbon disulfide extraction and injection of the extract. Detection is achieved by use of a Flame Ionization Detector (FID).

Included at the end of Section II is a listing of and copies of site specific procedures, site specific methods and company method modifications for methods which are utilized to analyze the samples in accordance with OAC 3745-54-13.

II. STANDARD ANALYTICAL PROCEDURES

PARAMETER	METHOD	REFERENCE
Sample Work-Up Techniques		
General Extractions		
	Extraction Procedure (EP) Toxicity Test Method and Structural Integrity Test	1/1310A
	Toxicity Characteristic Leaching Procedure (TCLP)	1/1311
Metals Acid Digestions		
	For flame atomic absorption spectroscopy (AAS) or inductively coupled plasma spectroscopy (ICP)	1/3005A, 3010A
	Microwave assisted	1/3015; 2/3030K; 3/D4309, D5258
	For graphite furnace atomic absorption spectroscopy (GFAA)	1/3020A
	Of sediments, sludges, soils, and oils	1/3050B
	-- Microwave assisted	1/3051
	Parr acid bomb digestion	3/E886, E926; 6/
Organic Extractions and Cleanups		
	Separatory funnel liquid-liquid extraction	1/3510C
	Continuous liquid-liquid extraction	1/3520C
	Solid phase extraction (SPE)	1/3535
	Soxhlet extraction	1/3540C, 3541
	Sonication extraction	1/3550B
	Waste dilution	1/3580A, 3585
	Alumina cleanup	1/3610B, 3611B
	Florisil cleanup	1/3620B
	Silica gel cleanup	1/3630C
	Gel-permeation cleanup	1/3640A
	Acid-base partition cleanup	1/3650B
	Sulfur cleanup	1/3660B
	Sulfuric acid/permanganate cleanup	1/3665A
Elemental Analytical Methods		
Inductively coupled plasma atomic emission spectroscopy (ICP)		1/6010B
Antimony		
	Atomic absorption, direct aspiration method	1/7040; 4/204.1
	Atomic absorption, furnace technique	1/7041; 4/204.2
Arsenic		
	Atomic absorption, furnace technique	1/7060A; 4/206.2
	Atomic absorption, gaseous hydride method	1/7061A; 4/206.3
Barium		
	Atomic absorption, direct aspiration method	1/7080A; 4/208.1
	Atomic absorption, furnace technique	1/7081; 4/208.2
Beryllium		
	Atomic absorption, direct aspiration method	1/7090; 4/210.1
	Atomic absorption, furnace technique	1/7091; 4/210.2
Cadmium		
	Atomic absorption, direct aspiration method	1/7130; 4/213.1
	Atomic absorption, furnace technique	1/7131A; 4/213.2

PARAMETER	METHOD	REFERENCE
Calcium		
	Atomic absorption, direct aspiration method	1/7140; 4/215.1
	Atomic absorption, furnace technique	4/215.2
Chromium		
	Atomic absorption, direct aspiration method	1/7190; 4/218.1
	Atomic absorption, furnace technique	1/7191; 4/218.2
	Hexavalent chromium: Co/precipitation	1/7195
	Hexavalent chromium: Colorimetric	1/7196A; 2/3500CrD
	Hexavalent chromium: Chelation/extraction	1/7197; 4/218.4
	Hexavalent chromium: Ion Chromatography	2/3500CrE
Copper		
	Atomic absorption, direct aspiration method	1/7210; 4/220.1
	Atomic absorption, furnace technique	1/7211; 4/220.2
Iron		
	Atomic absorption, direct aspiration method	1/7380; 4/236.1
	Atomic absorption, furnace technique	1/7381; 4/236.2
	Phenanthroline method (ferrous)	2/3500FeD
Lead		
	Atomic absorption, direct aspiration method	1/7420; 4/239.1
	Atomic absorption, furnace technique	1/7421; 4/239.2
Magnesium		
	Atomic absorption, direct aspiration method	1/7450; 4/242.1
Manganese		
	Atomic absorption, direct aspiration method	1/7460; 4/243.1
	Atomic absorption, furnace technique	1/7461; 4/243.2
Mercury (manual cold/vapor technique)		
	In liquid waste	1/7470A
	In solid or semisolid waste	1/7471A
Nickel		
	Atomic absorption, direct aspiration method	1/7520; 4/249.1
	Atomic absorption, furnace technique	1/7521; 4/249.2
Selenium		
	Atomic absorption, furnace technique	1/7740; 4/270.2
	Atomic absorption, gaseous hydride method	1/7741A; 4/270.3
Silver		
	Atomic absorption, direct aspiration method	1/7760A; 4/272.1
	Atomic absorption, furnace technique	1/7761; 4/272.2
Thallium		
	Atomic absorption, direct aspiration method	1/7840; 4/279.1
	Atomic absorption, furnace technique	1/7841; 4/279.2
Zinc		
	Atomic absorption, direct aspiration method	1/7950; 4/289.1
	Atomic absorption, furnace technique	1/7951; 4/289.2

PARAMETER	METHOD	REFERENCE
Organic Analytical Methods		
Gas Chromatography Methods		
	Halogenated volatile organics	1/8010B, 8021B
	Volatile Organics	3/D5830
	Nonhalogenated volatile organics	1/8015B
	Aromatic volatile organics	1/8021B
	Phenols	1/8041
	Phthalate esters	1/8061A
	Nitrosamines	8070A
	Organochlorine pesticides and halowaxes	1/8081
	Polychlorinated biphenyls (PCBs)	1/8082; 8080A
	Nitroaromatics and cyclic ketones	1/8091
	Polynuclear aromatic hydrocarbons	1/8100
	Haloethers	1/8111
	Chlorinated hydrocarbons	1/8121
	Organophosphorous pesticides	1/8141A
	Chlorinated herbicides	1/8151A
Gas Chromatography/Mass Spectroscopy Methods		
	Volatile organics	1/8260B; 7/624
	Semi-volatile organics	1/8270C; 7/625
Other Organic Methods		
	Qualitative infrared spectroscopy	1/8410, 8430, 8440; 3/D2621, D4053; 5/
	GC/FTIR method	1/8410
	Heat of combustion, bomb calorimeter method	1/5050; 3/D240, D2015
	Halogen and sulfur content	
	Chlorine content	3/D808, D2361, D4327
	Halogen content	3/D808, D2361, D4327
	Sulfur content	3/D129, D3177, D4327
	Oil and grease	1/4030, 9070, 9071A; 2/5520; 4/413.1, 413.2
	Petroleum hydrocarbons, total recoverable	2/5520F; 4/418.1
	Phenolics	1/9065, 9066, 9067; 2/5530, 6420; 4/420.1
	Solvent Distillation	3/D86, D1078
	Total organic carbon	1/9060; 2/5310; 3/D2579
Screening Methods		
	Physical description	3/D4979
	Flammability potential screen	3/D4982
	Water compatibility	3/D5058C
	Oxidizer screen	3/D4981
	pH screen	3/D4980
	Sulfide screen	3/D4978Cyanide screen3/D5049
	Commingled waste compatibility	3/D5058A
	Polymerization potential	3/D5058B
	Paint filter test	1/9095A
	Bulk density and apparent specific gravity screen	3/D5057
	Polychlorinated biphenyls (PCBs) screen	1/4020, 9078

PARAMETER	METHOD	REFERENCE
Miscellaneous Analytical Methods		
Acidity		2/2310
Alkalinity		2/2320
Ammonia		2/4500NH_3; 4/350.3
Anions		
By ion chromatography		1/9056; 3/D4327; 4/300.0
Chlorides	1/9250, 9251, 9252A, 9253; 2/4500Cl^-; 4/300.0, 325.3	
Sulfates	1/9035, 9036, 9038; 2/4500SO_4^{2-}; 4/300.0, 375.3	
Nitrates	1/9200A, 9210; 2/4500NO_3^-; 4/300.0, 352.1, 353.2	
Fluoride	1/9214; 2/4500F^-; 4/300.0, 340.2, 340.3	
Bromides	1/9211; 2/4500Br^-; 4/300.0, 320.1	
Phosphates	2/4500P; 4/300.0, 365.1/4	
Ash content		2/2840G; 3/D482, D3174
Conductivity/conductance		1/9050A; 2/2510; 3/D1125; 4/120.1
Cyanides		
Total and amenable cyanides	1/9010A, 9012A, 9013; 2/4500CN^-C,G; 4/335.1	
Dissociable cyanides		1/9213; 2/4500CN^-I
Flash point		
Pensky-Martens closed-cup method		1/1010; 3/D93
Setaflash closed-cup method		1/1020A; 3/D3278
Cleveland open-cup method		3/D92
Oxidation/reduction (redox) potential (ORP)		3/D1498
pH measurement	1/9040B, 9041A, 9045C; 2/4500H^+; 3/E70; 4/150.1	
Solids		
Total (TS) at 103/105°C		2/2540B; 4/160.3
Dissolved (TDS) at 180°C		2/2540C; 4/160.1
Total suspended (TSS) at 103/105°C		2/2540D; 4/160.2
Fixed and volatile at 500°C		2/2540E, 2540G; 4/160.4
Specific gravity		2/2710F; 3/D70, D891, D1217, D1429
Sulfides		
Extractable sulfides		1/9031
Soluble sulfides		1/9215; 2/4500S^{2-}
Total sulfides		1/9030A; 2/4500S^{2-}
Viscosity		3/D88, D446, D2983
Water content		3/D95, D3173, D4006, E203

The leading digit of the reference numbers above are keyed to the numbered publications below.

1/ *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, SW-846, Third Edition, U.S. Environmental Protection Agency, Office of Solid Waste, Washington, DC, September 1986, as amended by Final Update I (July 1992), and Final Update II (September 1994), Final Update IIA (August 1993), and Final Update IIB (January 1995), or more recent edition, update or revision including Proposed Update III (available from Superintendent of Documents, Government Printing Office, Washington, DC 20402).

2/ *Standard Methods for the Examination of Water and Wastewater*, 18th Edition, American Public Health Association (APHA), American Water Works Association, Water Environment Federation, 1992, and 18th Edition Supplement, 1994, or more recent edition or update (available from APHA, 1015 Fifteenth Street, NW, Washington, DC 20005).

3/ *Annual Book of ASTM Standards*, American Society for Testing and Materials (ASTM), 1993, or more recent edition or revision (available from 1916 Race Street, Philadelphia, PA 19013).

4/ *Methods for Chemical Analysis of Water and Wastes*, EPA-600/4-79-020, U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory (EMSL), Cincinnati, 1979, as revised March 1983, or more recent revision or technical addition (available from EMSL, Cincinnati, OH 45268).

5/ "Infrared Analysis Method" in *IERL-RTP Procedures Manual:*

Level 1 Environmental Assessment, Second Edition, EPA-600/7-78-201, October 1978, or more recent edition.

6/ "Acid Digestion Bombs", *Bulletin 4745*, Parr Instrument Company (Moline, IL 61265), or more recent bulletin.

7/ "Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater", Title 40, Part 136, Appendix A, Code of Federal Regulations, U. S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory/Cincinnati, as amended June 1986, or more recent revision (available from Superintendent of Documents, Government Printing Office, Washington, DC 20402).

8/ Bellar, T. A., and Lichtenberg, J. J., "The Determination of Polychlorinated Biphenyls in Transformer Fluid and Waste Oils", EPA-600/4-81-045, U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory (EMSL), Cincinnati, 1982.

Standard analytical procedures not listed here, which may be needed, will be taken from the above-referenced sources or other recognized sources, e.g., Official Methods of Analysis of the Association of Official Analytical Chemists (AOAC), 15th Edition, AOAC, Arlington, Virginia, 1990, or more recent supplements or editions (available from AOAC, 2200 Wilson Blvd., Suite 400, Arlington, VA 22201).

Below is a summary table which lists the site specific methods and procedures and company modifications included in the following pages. The summary table provides a description of the method, the site specific number assigned to the document and, if

applicable, the ASTM, EPA, Standard Method or SW846 Method that it is a modification of.

METHOD DESCRIPTION	SITE SPECIFIC #	METHOD MODIFICATION OF:
Acidity/Alkalinity	WM 97-68	ASTM D 1067-92
Anions by Ion Chromatography	WM 97-40	EPA 300.0-1
Cyanides Screen by Gas Detector Tube	VIC0789-2	N/A
Cyanide Screen by Cyantesmo Paper	SSP-D5049	ASTM D 5049-90
PCBs by Gas Chromatography	SW846-8080A	N/A
PCBs by Gas Chromatography	SSP-8080A	SW846-8080A
Determinative Chromatographic Separations	SSP-8000B	SW846-8000B
pH by Meter	WM 97-71	ASTM D 4980-89B
Radioactivity Test	WM 97-36	ASTM D 5928-96
Redox Potential	WM 97-66	ASTM D 1498-93
Separatory Funnel Liquid-Liquid Extraction	SSP-3510C	SW846, Method 3510C
Sulfur Cleanup	SSP-3660B	SW846, Method 3660B
Sulfuric Acid/Permangante Cleanup	SSP-3665A	SW846, Method 3665A
Solvents by Gas Chromatography	WM 97-02	ASTM D 5830-95
Sulfide Screen by Gas Detector Tube	VIC0789-3	N/A

METHOD MODIFICATION

ASTM D 1067

DETERMINATION OF PERCENT ACIDITY AND ALKALINITY IN BUFFERED OR UNBUFFERED HAZARDOUS WASTE BY ELECTROMETRIC TITRATION

"This method is confidential and is intended for the sole use and benefit of the Vickery Facility, and may not be modified, reproduced, circulated or quoted in whole or in part, except with the approval of the Vickery Facility. Vickery assumes no responsibility whatsoever for the precision and bias of results or the safety of any analysis utilizing this method unless performed by Vickery. It is the responsibility of the user of this method to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use. This method may be changed by WMO at any time without notice to the user."

1.0 SCOPE AND APPLICATION

1.1 This method is for determining the percent acidity or alkalinity of hazardous waste, by electrometric titration.

1.2 This method is applicable to determine the acidity or alkalinity of aqueous liquid, solid, and semisolid hazardous waste samples. It may be used for samples containing a significant amount of organic material.

1.3 The method is also applicable to determination of the alkalinity of buffered hazardous wastes.

1.3.1 Buffered hazardous waste includes those stabilized with reagents such as lime, kiln dust, calcium oxide, magnesium oxide and other cementaceous materials.

1.3.2 Many stabilization reagents also fall into this category.

1.3.3 Alkalinity of buffered waste is measured by back-titration procedure.

1.4 A hazardous waste should be approached as an unbuffered material unless site operations or operator knowledge directs otherwise.

1.5 The data is reported as percent acidity or alkalinity.

1.5.1 Unless otherwise specified, acidity data is reported as % H_2SO_4. The data can be reported in terms of other acids present in Section 8.3.

1.5.2 Unless otherwise specified, alkalinity data is reported as NaOH. The data can be reported in terms of other alkalies presented in Section 8.3.

1.6 The data is applicable to the broad range of disposal decisions, regulatory issues, and process control situations encountered in the hazardous waste disposal area.

2.0 SUMMARY OF METHOD

2.1 For unbuffered samples, a weighed portion is titrated with standardized aqueous acid or alkali, to a defined electrometrically monitored endpoint.

2.2 For buffered alkali samples, a known volume of standardized acid is mixed with a weighed portion of sample for ten minutes. the excess is acid back titrated with standardized alkali to a defined, electrometrically monitored endpoint.

3.0 INTERFERENCES

3.1 The presence of oils or precipitated solids may interfere with the operation of the pH electrode, requiring that the electrode be cleaned periodically before and during use.

3.2 Metals in their elemental states will react with hydrochloric acid titrant, and thereby contribute to the measured alkalinity. This effect is more pronounced with "back-titration" procedure in Paragraph 7.7, than with the procedure in Paragraph 7.5. The presence of elemental metals may also cause erratic results unless all analysts use uniform sample size, volume of hydrochloric acid titrant and stirring times.

3.3 In samples containing oxidizable or hydrolyzable species such as ferrous or ferric ion, iron, aluminum, and manganese, the reaction rates at room temperatures may be slow enough to cause drifting end points.

4.0 APPARATUS

4.1 pH Meter, guideline documentation presented in ASTM D 1293.

4.2 Balance, readable to 0.001 g.

4.3 Magnetic stirplate and stirbar

4.4 Buret, 50 mL capacity

4.5 Beaker, 250 mL capacity

4.6 Titroprocessor, or other self calibrating, automated instrument, may be used in place of manual equipment.

5.0 REAGENTS

5.1 Reagent Water, reagent water is defined as water in which an interference is not observed at or above the method detection limit (MDLs) of the analyte(s) of interest. Typically double deionized water, with electrical resistivity of > 1.0 mohms/cm at 25°C or electrical conductivity of < 1.0 microseimens/cm at 25°C, is used.

5.2 Hydrochloric acid 1.0 N, prepare as directed in ASTM E200, or purchase certified reagent.

5.3 Sodium hydroxide, 1.0 N, prepare as directed in ASTM E200, or purchase certified reagent.

6.0 SAMPLE COLLECTION, PRESERVATION AND HANDLING

6.1 All samples must be collected using a sampling plan that addresses the considerations discussed in the sites's Waste Analysis Plan.

6.2 The samples should be analyzed as soon as possible.

7.0 PROCEDURE

All Materials

7.1 Mount the electrodes and calibrate the system as recommended by the manufacturer.

7.2 Weigh an appropriate sample into a tared 250 mL beaker, using one of the following guidelines.

7.2.1 The sample weight can fall between one and ten grams.

7.2.2 A sample weight can be selected, which is 100 times the milliequivalent weight of the acidic or alkali species presented in Section 8.3.

7.2.3 For samples which react slowly with hydrochloric acid titrant, individual laboratory may specify a uniform sample size in order to increase precision.

7.3 Bring to a total volume of approximately 100 mL with reagent water. Add the stirbar and place onto the stirplate. Turn on the stirplate and establish an even stirring rate, while minimizing aeration or splattering of the sample mixture.

7.4 If the sample is alkali buffered as described in Section 1.3, go to Section 7.7.

Unbuffered Materials

7.5 Titrate with either acid or base to the appropriate endpoint. The endpoint pH should be stable to ± 0.2 pH units for ten seconds.

7.5.1 The recommended endpoint for the percent acidity measurement is 8.3.

7.5.2 The recommended endpoint for the percent alkalinity measurement is 4.5.

7.5.3 Titration to an endpoint (for example 7.0) between the recommended values is acceptable, if required by site or process requirements. The need for this change and the actual endpoint must be documented in a site specific practice.

7.6 Go to Section 8.1 to perform the calculations.

Buffered Materials

7.7 Add 50 mL of 1.0 N HCl to the beaker and stir for 10 minutes.

7.7.1 If the pH is greater than 3.7, restart the analysis at Section 7.2, using a smaller sample mass.

7.8 Refer to Section 7.5.2 and titrate the excess HCl with standard alkali to a pH 4.5 endpoint.

7.9 Go to Section 8.2 to perform the calculations.

8.0 CALCULATIONS

8.1 Calculate the acidity or alkalinity of unbuffered samples using the following equation. Refer to Section 8.3 for the milliequivalent weight of the acid or alkali species.

$$\% \text{ (Acidity or Alkalinity)} = \frac{V \times N \times M \times 100}{G}$$

where:

V	=	volume of titrant, mL
N	=	normality of titrant, meq/mL
M	=	meq. wt. of species, g/me, Sec. 8.3
G	=	sample mass, grams

8.2 Calculate the alkalinity of buffered samples using the following equation. Refer to Section 8.3 for the milliequivalent weight of the alkali species.

$$\% \text{ Alk} = \frac{[(V_{HCl} \times N_{HCl}) - (V_{NaOH} \times N_{NaOH})] \times M \times 100}{G}$$

where:

V_{HCl}	=	volume of HCl titrant used, mL
N_{HCl}	=	normality of HCl titrant, me/mL
V_{NaOH}	=	volume of NaOH titrant used, mL
N_{NaOH}	=	normality of NaOH titrant, me/mL
M	=	milliequivalent weight of species, g/me (See Sec. 8.3)
G	=	sample mass, grams

8.3 The following lists the milliequivalent weights of some acids and bases.

Acid Species	Formula	Meq Wt. (g/meq)
Acetic acid	CH_3CO_2H	0.0601
Chromic acid	H_2CrO_4	0.0590
Fluoroboric acid	HBF_4	0.0880
Formic acid	HCO_2H	0.0460
Hydrochloric acid	HCl	0.0365
Nitric acid	HNO_3	0.0630
Phosphoric acid	H_3PO_4	0.0490
Sulfuric acid	H_2SO_4	0.0490

Alkali Species	Formula	Meq Wt (g/meq)
Ammonia	NH_3	0.0170
Ammonium hydroxide	NH_4OH	0.0350
Calcium carbonate	$CaCO_3$	0.0500
Calcium hydroxide	$Ca(OH)_2$	0.0370
Potassium hydroxide	KOH	0.0560
Sodium bicarbonate	$NaHC0_3$	0.0420
Sodium carbonate	$NaCO_3$	0.0530
Sodium hydroxide	NaOH	0.0400

9.0 QUALITY CONTROL

9.1 Follow current quality control policy and procedures.

10.0 REFERENCES

10.1 ASTM D1293, Standard Test Methods for pH of Water

10.2 ASTM E200, Standard Practice for Preparation, Standardization and Storage of Standard Solutions for Chemical Analysis.

METHOD MODIFICATION

EPA Test Method 300.0

Test Method for the Determination of Inorganic Anions by Ion Chromatography

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1.0 SCOPE AND APPLICATION

1.2. The matrices applicable to each method are show below:

C. The method can also be used to determine the total anions in the collection solutions of bomb combustate samples.

4.0 INTERFERENCES

4.2 The water dip should not be observed in the combustate samples; the collecting solution is a concentrated eluent solution that will match the eluent strength when diluted to 100 mL with reagent water according to the bomb combustion procedure.

4.9 Interferences from compounds such as ClO_4^-, $Fe(CN)_6^{3-}$, other metal-cyanide complexes, aromatics, surfactants, and humic acids reduces the column capacity by occupying the available sites in the column resin. Some of these contaminants bind irreversibly. Also, high concentrations of Fe, Ni, CU, Zn, hydroxide ion, peroxides, and dissolved gases, have the potential to interfere with the analysis. Because these sources of contamination cause irreversible damage, prevention may be the best mode of avoiding the interference. Routine column clean-ups with 1N HCl can reduce the concentration of some metals and inorganic species retained by the columns

4.10 Storage of diluted eluent can allow microbial growth and cause the column blockage. It is important to prepare fresh eluent frequently (at least every two weeks) to be used immediately. Frequent flushing and proper storage of the columns are also very important.

6.0 APPARATUS AND MATERIALS

6.2.1 Precolumn, a guard column placed before the separator column to protect the separator column from being fouled by particulates or certain organic constituents. Usually packed with a substrate the same as that in the separator column. Use Dionex AG4A guard column P/N 37042 or equivalent.

6.2.3 Suppressor column, a column that is capable of converting the eluent and separated anions to their respective acid forms. Use Dionex AMMC column P/N 38019 or equivalent.

7.0 REAGENTS

7.2 Reagent water, reagent water is defined as water in which an interference is not observed at, or above, the method detection limits (MDLs) of the analyte(s) of interest. Typically, double deionized water with electrical resistivity of > 1.0 Mohms-cm at 25°C or electrical conductivity of <. 1.0 microsiemens/cm at 25°C is used. Column life may be extended by passing reagent water through a 0.22-urn filter prior to use.

7.3 The optimal eluent concentration for separations is dependent on the column set to be used. Thus, recommendations from the manufacturer of the columns should be used as a guideline for eluent preparation. Commercially available concentrated eluent solution can also be used. For example, if Dionex AS4A separator column is used, then Dionex AS4A 1.7 mM sodium bicarbonate and 1.8 mM sodium carbonate eluant concentrate P/N 39513 is recommended.

7.5 Stability of Standards: Stock Standards are stable for at least one month when stored at 4°C. For stock solutions purchased commercially with an expiration date, the stock solutions can be used until the expiration date provided Section 10.7 and 10.12 are satisfied. Dilute working standards should be prepared weekly, except those that. contain nitrite and phosphate should be prepared dally.

9.0 QUALITY CONTROL Laboratories will follow all aspects of the method quality control process as described in Section 9, except as noted below.

9.3.2 Laboratory Fortified Blank (LFB)/Quality Control Sample (QCS) - The laboratory will analyzed one LFB each 20 samples. Accuracy as percent recovery (Sec. 9.4.2) is calculated. However, the analytical run will not be adjudged out of control based on LFB results if the analysis is for "total" anions.

9.3.2.1 If the analysis is being performed as a "free" anion (i.e. aqueous matrix), then the LFB method criteria are required, since the samples would not be digested via bomb calorimetry and the recovery of a spiked water blank would be an indication of the laboratory's ability to make accurate and precise measurements on an aqueous matrix.

9.3.2.2 If the analysis is being performed as a "total" anion (i.e., from a non-aqueous matrix, e.g. total chlorides from a fuels blend of chl6rinated solvents), then the LFB method criteria are not critical, since the "total" anion samples are not, by definition, aqueous The "total" anions are first digested via bomb calorimetry prior to IC analysis. The QCS is more indicative of the entire analytical process and is used to monitor the precision and accuracy of the method.

9.3.3 The laboratory must use QCS analyses data to assess laboratory performance against the required control limits of the mean ± 3s from the statistical evaluation of at least thirty points. Until 30 points are available, the range of (true value ± 10%) shall be used as the acceptance limits.

11.0 PROCEDURE

11.5 If the response for the peak exceeds the working range of the system, dilute the sample with an appropriate amount of eluent solution instead of reagent water and reanalyze.

12.0 CALCULATION

12.3.1 Enter the calibration standard concentrations or peak heights from the integrator or recorder into a calculator with linear least squares capabilities.

12.3.2 Calculate the following parameters: slope (s), intercept (I), and correlation coefficient (r). The slope and intercept define a relationship between the concentration and instrument response of the form:

$$Y = sx + I$$

where:

Y = predicted instrument response
s = response slope
x = concentration of standard
I = intercept

Rearranging the above equation yields the concentration of a sample corresponding to an instrumental measurement.

$$x = (Y-I)/s$$

where:

x = calculated concentration for the sample
Y = actual instrument response for the sample

14.Q REFERENCES

14.5 EPA 5W846-9056; Anion Chromatography Method, Sept.1994

Vickery Site Specific

Method for Screening of Cyanides using

Gas Detector Tubes

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GAS DETECTOR TUBE METHOD FOR CYANIDE

1.0 SCOPE AND APPLICATION

1.1 This method is designed as a screening device to detect low level amounts of cyanide in a acidified atmosphere by the utilization of a gas detector tube as evolved hydrogen cyanide gas.

2.0 SUMMARY OF METHOD

2.1 A portion of the sample is acidified in an Erlenmeyer Flask to release hydrogen cyanide gas. The gas is funneled through a gas detector tube creating a stain inside the tube in proportions to the concentration of cyanide gas in the vapor. A definite color change in the tube indicates the positive presence of cyanide.

3.0 TERMINOLOGY

3.1 Screening Method means a preliminary qualitative or semi-quantitative test developed from classical qualitative and quantitative techniques. The method is designed to efficiently give the user specific information about the waste which will aid in determining waste identification, process compatibility and safety in handling.

4.0 SAMPLE STORAGE AND PRESERVATION

4.1 Samples should be analyzed as soon as possible. All liquid samples should be preserved with 2.5N sodium hydroxide to adjust the pH range between 10 to 13, if pH is less than 10 and samples are to be stored.

5.0 APPARATUS

5.1 A 500 milliliter ground glass stoppered Erlenmeyer flask.

5.2 A gas detector pump.

5.3 An automatic dispensing pipetor.

5.4 A 100 milliliter graduated cylinder.

5.5 pH meter.

6.0 REAGENTS

6.1 Gas detector tube with hydrogen cyanide indicator.

6.2 Concentrated hydrochloric or sulfuric add, or acidic waste.

6.3 pH paper

7.0 PROCEDURE

7.1 Use between 1 and 100 ml of sample. Volume can be measured by using a graduated cylinder and/or an automatic dispensing pipetor.

7.2 Acidify this sample test portion to a pH of 2 or less with concentrated hydrochloric, sulfuric or waste add. If waste is to be used, place the waste add in the flask and add the sample test portion to a total volume of 100 ml. Gas vapor should now form.

7.3 Break both of the glass tip ends of the gas detector tube. Insert the tube into the gas detector pump. (Arrow towards pump)

7.4 Place the gas detector tube inside the mouth of the 500 milliliter Erlenmeyer flask. The end of the tube should reach halfway inside the flask. Actuate the pump the number of times directed in the manufacturers instructions and read the measurement of concentration by total length of discoloration.

7.5 If the detector tube reading is above the scale of the tube, alter the amount of sample used and/or the detector tube with an appropriate scale. This will reduce the amount of cyanide released and will allow the vapor concentration to be on the scale of the detector tube.

8.0 CONCENTRATION CALCULATION

8.1 In order to screen the concentration of releasable cyanide in the liquid sample, the concentration of the gas must be converted to a concentration in liquid. This can be done by using the following calculation.

$$1 \text{ ppm HCN in gas} = 1.13 \text{ mg HCN/m}^3 \text{ in gas}$$

X = ml of liquid sample
Y = ml vapor space in Erlenmeyer flask
Z = ppm HCN reading on tube

To determine the mass (mg) of HCN released from the liquid into the gas:

$$Z \text{ ppm HCN} \times \frac{1.13 \text{ mg HCN/m}^3}{\text{ppm HCN}} \times Y \text{ ml} \times \frac{1 \text{ cm}^3}{\text{ml}} \times \frac{1 \text{ m}^3}{(100 \text{ cm})^3} = 1.13 \times 10^{-6} YZ \text{mgHCN}$$

To determine the concentration of HCN in the liquid sample:

$$1.13 \times 10^{-6} YZ \text{mgHCN} \times \frac{1}{X \text{ ml}} \times \frac{1000 \text{ml}}{1 \text{ L}} = \frac{1.13 \times 10^{-3} YZ \text{mg}}{X \text{ L}}$$

Example: if you use 5 ml of liquid sample and acidify it into 95 ml of waste from T- 1 or T-2, the Erlenmeyer flask has a vapor volume of 500 ml and you obtain a reading on the tube of 100 ppm, the total releasable cyanide is calculated as:

$$\frac{1.13 \times 10^{-3} YZ \text{mg}}{X \text{ L}} = \frac{1.13 \times 10^{-3} \times 500 \times 100}{5} = 11.3 \text{mg/l}$$

9.0 REMARKS

9.1 The gas detector tube can only be used once and must be disposed of after a negative or positive result. After a positive result, the discoloration may persist for a short period of time, so that evaluation should be carried out immediately after the measurement.

9.2 Test the gas detector pump by inserting a gas detector tube with glass tip ends still intact. Squeeze the pump once and the pump should maintain vacuum tightness.

9.3 All testing should be done in the fume hood.

10.0 QUALITY CONTROL

10.1 A quality control check sample is performed on each lot of sample tubes.

10.2 Duplicates and spikes will be performed on every 20th sample analyzed.

10.3 Since this is a semi-quantitative screening method, if the calculated concentration is 125 mg/l or larger, the sample should be analyzed by

another, quantitative method. This is ½ the concentration of our site limit of 250 mg/l reactive (releasable) cyanide.

Vickery Site Specific Procedure

to

ASTM D5049 - 90

Standard Test Method

for

Screening of Cyanide in Waste

(Test Method C - Cyantesmo Paper)

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19.0 INTERFERENCES

19.2 CYANTESMO paper is very sensitive to cyanide solutions weakly acidified with sulfuric acid and does not react with alkaline solutions. Strongly acidic solutions destroy the Cyantesmo reagent. To circumvent interferences by volatile oxidizing or reducing agents hydrocyanic acid can be set free by sodium hydrogen carbonate.

20.0 REAGENTS AND MATERIALS

20.1 Sulfuric Aci4 (H_25O_4). Dilute 1:1 ,(v/v) Sulfuric Acid (Reagent Grade or equivalent) with water.

21.0 PROCEDURE

21.2 Acidify the sample with Sulfuric Acid Solution(H_2SO_4). Gently shake the acidified solution.

21.3 After shaking, tear off the Cyantesmo test strip and position the strip so that the bottom of the paper is above the waste and the remainder of the strip extends up into the test tube. Then stopper the test tube.

METHOD 8080A

ORGANOCHLORINE PESTICIDES AND POLYCHLORINATED BIPHENYLS BY GAS CHROMATOGRAPHY

1.0 SCOPE AND APPLICATION

1.1 Method 8080 is used to determine the concentration of various organochlorine pesticides and polychlorinated biphenyls (PCBs). The following compounds can be determined by this method:

Compound Name	CAS No.[a]
Aldrin	309-00-2
α-BHC	319-84-6
β-BHC	319-85-7
δ-BHC	319-86-8
γ-BHC (Lindane)	58-89-9
Chlordane (technical)	12789-03-6
4,4′-DDD	72-54-8
4,4′-DDE	72-55-9
4,4′-DDT	50-29-3
Dieldrin	60-57-1
Endosulfan I	959-98-8
Endosulfan II	33212-65-9
Endosulfan sulfate	1031-07-8
Endrin	72-20-8
Endrin aldehyde	7421-93-4
Heptachlor	76-44-8
Heptachlor epoxide	1024-57-3
4,4′-Methoxychlor	72-43-5
Toxaphene	8001-35-2
Aroclor-1016	12674-11-2
Aroclor-1221	1104-28-2
Aroclor-1232	11141-16-5
Aroclor-1242	53469-21-9
Aroclor-1248	12672-29-6
Aroclor-1254	11097-69-1
Aroclor-1260	11096-82-5

a Chemical Abstract Services Registry Number.

1.2 Table 1 lists the method detection limit for each compound in organic-free reagent water. Table 2 lists the estimated quantitation limit (EQL) for other matrices.

2.0 SUMMARY OF METHOD

2.1 Method 8080 provides gas chromatographic conditions for the detection of ppb concentrations of certain organochlorine pesticides and PCBs. Prior to the use of this method, appropriate sample extraction techniques must be used. Both neat and diluted organic liquids (Method 3580, Waste Dilution) may be analyzed by direct injection. A 2 to 5 µL sample is injected into a gas chromatograph (GC) using the solvent flush technique, and compounds in the GC effluent are detected by an electron capture detector (ECD) or an electrolytic conductivity detector (HECD).

2.2 The sensitivity of Method 8080 usually depends on the concentration of interferences rather than on instrumental limitations. If interferences prevent detection of the analytes, Method 8080 may also be performed on samples that have undergone cleanup. Method 3620, Florisil Column Cleanup, by itself or followed by Method 3660, Sulfur Cleanup, may be used to eliminate interferences in the analysis.

3.0 INTERFERENCES

3.1 Refer to Methods 3500, 3600, and 8000.

3.2 Interferences by phthalate esters can pose a major problem in pesticide determinations when using the electron capture detector. These compounds generally appear in the chromatogram as large late-eluting peaks, especially in the 15% and 50% fractions from the Florisil cleanup. Common flexible plastics contain varying amounts of phthalates. These phthalates are easily extracted or leached from such materials during laboratory operations. Cross contamination of clean glassware routinely occurs when plastics are handled during extraction steps, especially when solvent-wetted surfaces are handled. Interferences from phthalates can best be minimized by avoiding contact with any plastic materials. Exhaustive cleanup of reagents and glassware may be required to eliminate background phthalate contamination. The contamination from phthalate esters can be completely eliminated with a microcoulometric or electrolytic conductivity detector.

4.0 APPARATUS AND MATERIALS

4.1 Gas chromatograph

4.1.1 Gas Chromatograph: Analytical system complete with gas chromatograph suitable for on-column injections and all required accessories, including detectors, column supplies, recorder, gases, and syringes. A data system for measuring peak heights and/or peak areas is recommended.

4.1.2 Columns

4.1.2.1 Column 1: Supelcoport (100/120 mesh) coated with 1.5% SP-2250/1.95% SP-2401 packed in a 1.8 m x 4 mm ID glass column or equivalent.

4.1.2.2 Column 2: Supelcoport (100/120 mesh) coated with 3% OV-1 in a 1.8 m x 4 mm ID glass column or equivalent.

4.1.3 Detectors: Electron capture (ECD) or electrolytic conductivity detector (HECD).

4.2 Kuderna-Danish (K-D) apparatus:

4.2.1 Concentrator tube: 10 mL, graduated (Kontes K-570050-1025 or equivalent). A ground-glass stopper is used to prevent evaporation of extracts.

4.2.2 Evaporation flask: 500 mL (Kontes K-570001-500 or equivalent). Attach to concentrator tube with springs, clamps, or equivalent.

4.2.3 Snyder column: Three ball macro (Kontes K-503000-0121 or equivalent).

4.2.4 Snyder column: Two ball micro (Kontes K-569001-0219 or equivalent).

4.2.5 Springs - 1/2 inch (Kontes K-662750 or equivalent).

4.3 Boiling chips: Solvent extracted, approximately 10/40 mesh (silicon carbide or equivalent).

4.4 Water bath: Heated, with concentric ring cover, capable of temperature control (±5°C). The bath should be used in a hood.

4.5 Volumetric flasks, Class A: sizes as appropriate with ground-glass stoppers.

4.6 Microsyringe: 10 µL.

4.7 Syringe: 5 mL.

4.8 Vials: Glass, 2, 10, and 20 mL capacity with Teflon-lined screw caps or crimp tops.

4.9 Balances: Analytical, 0.0001 g and Top loading, 0.01 g.

5.0 REAGENTS

5.1 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

5.2 Organic-free reagent water - All references to water in this method refer to organic-free reagent water, as defined in Chapter One.

5.3 Solvents

5.3.1 Hexane, C_6H_{14} - Pesticide quality or equivalent.

5.3.2 Acetone, CH_3COCH_3 - Pesticide quality or equivalent.

5.3.3 Toluene, $C_6H_5CH_3$ - Pesticide quality or equivalent.

5.3.4 Isooctane, $(CH_3)_3CCH_2CH(CH_3)_2$ - Pesticide quality or equivalent.

5.4 Stock standard solutions:

5.4.1 Prepare stock standard solutions at a concentration of 1000 mg/L by dissolving 0.0100 g of assayed reference material in isooctane and diluting to volume in a 10 mL volumetric flask. A small volume of toluene may be necessary to put some pesticides in solution. Larger volumes can be used at the convenience of the analyst. When compound purity is assayed to be 96% or greater, the weight can be used without correction to calculate the concentration of the stock standard. Commercially prepared stock standards can be used at any concentration if they are certified by the manufacturer or by an independent source.

5.4.2 Transfer the stock standard solutions into vials with Teflon-lined screw caps or crimp tops. Store at 4°C and protect from light. Stock standards should be checked frequently for signs of degradation or evaporation, especially just prior to preparing calibration standards from them.

5.4.3 Stock standard solutions must be replaced after one year, or sooner if comparison with check standards indicates a problem.

5.5 Calibration standards: Calibration standards at a minimum of five concentrations for each parameter of interest are prepared through dilution of the stock standards with isooctane. One of the concentrations should be at a concentration near, but above, the method detection limit. The remaining concentrations should correspond to the expected range of concentrations found in real samples or should define the working range of the GC. Calibration solutions must be replaced after six months, or sooner, if comparison with check standards indicates a problem.

5.6 Internal standards (if internal standard calibration is used): To use this approach, the analyst must select one or more internal standards that are similar in analytical behavior to the compounds of interest. The analyst must further demonstrate that the measurement of the internal standard is not affected by method or matrix interferences. Because of these limitations, no internal standard can be suggested that is applicable to all samples.

5.6.1 Prepare calibration standards at a minimum of five concentrations for each analyte of interest as described in Section 5.5.

5.6.2 To each calibration standard, add a known constant amount of one or more internal standards, and dilute to volume with isooctane.

5.6.3 Analyze each calibration standard according to Section 7.0.

5.7 Surrogate standards: The analyst should monitor the performance of the extraction, cleanup (when used), and analytical system and the effectiveness of the method in dealing with each sample matrix by spiking each sample, tandard, and organic-free reagent water blank with pesticide surrogates. Because GC/ECD data are much more subject to interference than GC/MS, a secondary surrogate is to be used when sample interference is apparent. Two surrogate standards (tetrachloro-m-xylene (TCMX) and decachlorobiphenyl) are added to each sample; however, only one need be calculated for recovery. Proceed with corrective action when both surrogates are out of limits for a sample (Section 8.3). Method 3500 indicates the proper procedure for preparing these surrogates.

6.0 SAMPLE COLLECTION, PRESERVATION, AND HANDLING

6.1 See the introductory material to this chapter, Organic Analytes, Section 4.1. Extracts must be stored under refrigeration and analyzed within 40 days of extraction.

7.0 PROCEDURE

7.1 Extraction:

7.1.1 Refer to Chapter Two for guidance on choosing the appropriate extraction procedure. In general, water samples are extracted at a neutral, or as is, pH with methylene chloride, using either Method 3510 or 3520. Solid samples are extracted using Method 3540, 3541, or 3550.

7.1.2 Prior to gas chromatographic analysis, the extraction solvent must be exchanged to hexane. The exchange is performed during the K-D procedures listed in all of the extraction methods. The exchange is performed as follows:

7.1.2.1 Following K-D of the methylene chloride extract to 1 mL using the macro-Snyder column, allow the apparatus to cool and drain for at least 10 min.

7.1.2.2 Increase the temperature of the hot water bath to about 90°C. Momentarily remove the Snyder column, add 50 mL of hexane, a new boiling chip, and reattach the macro-Snyder column. Concentrate the extract using 1 mL of hexane to prewet the Snyder column. Place the K-D apparatus on the water bath so that the concentrator tube is partially immersed in the hot water. Adjust the vertical position of the apparatus and the water temperature, as required, to complete concentration in 5-10 min. At the proper rate of distillation the balls of the column will actively chatter, but the chambers will not flood. When the apparent volume of liquid reaches 1 mL, remove the K-D apparatus and allow it to drain and cool for at least 10 min.

7.1.2.3 Remove the Snyder column and rinse the flask and its lower joint into the concentrator tube with 1-2 mL of hexane. A 5 mL syringe is recommended for this operation. Adjust the extract volume to 10.0 mL. Stopper the concentrator tube and store

refrigerated at 4°C, if further processing will not be performed immediately. If the extract will be stored longer than two days, it should be transferred to a vial with a Teflon-lined screw cap or crimp top. Proceed with gas chromatographic analysis if further cleanup is not required.

7.2 Gas chromatography conditions (Recommended):

7.2.1 Column 1:

Carrier gas (5% methane/95% argon) flow rate:	60 mL/min
Column temperature:	200°C isothermal

When analyzing for the low molecular weight PCBs (PCB 1221-PCB 1248), it is advisable to set the oven temperature to 160°C.

7.2.2 Column 2:

Carrier gas (5% methane/95% argon) flow rate:	60 mL/min
Column temperature:	200°C isothermal

When analyzing for the low molecular weight PCBs (PCB 1221-PCB 1248), it is advisable to set the oven temperature to 140°C.

7.2.3 When analyzing for most or all of the analytes in this method, adjust the oven temperature and column gas flow to provide sufficient resolution for accurate quantitation of the analytes. This will normally result in a retention time of 10 to 12 minutes for 4,4'-DDT, depending on the packed column used.

7.3 Calibration: Refer to Method 8000 for proper calibration techniques. Use Table 1 and especially Table 2 for guidance on selecting the lowest point on the calibration curve.

7.3.1 The procedure for internal or external calibration may be used. Refer to Method 8000 for a description of each of these procedures.

7.3.2 Because of the low concentration of pesticide standards injected on a GC/ECD, column adsorption may be a problem when the GC has not been used for a day. Therefore, the GC column should be primed or deactivated by injecting a PCB or pesticide standard mixture approximately 20 times more concentrated than the mid-concentration standard. Inject this prior to beginning initial or daily calibration.

7.4 Gas chromatographic analysis:

7.4.1 Refer to Method 8000. If the internal standard calibration technique is used, add 10 µL of internal standard to the sample prior to injection.

7.4.2 Method 8000 provides instructions on the analysis sequence, appropriate dilutions, establishing daily retention time windows, and identification criteria. Include a mid-concentration standard after each group of 10 samples in the analysis sequence.

NOTE: A 72 hour sequence is not required with this method.

7.4.3 Examples of GC/ECD chromatograms for various pesticides and PCBs are shown in Figures 1 through 5.

7.4.4 Prime the column as per Section 7.3.2.

7.4.5 DDT and endrin are easily degraded in the injection port if the injection port or front of the column is dirty. This is the result of buildup of high boiling residue from sample injection. Check for degradation problems by injecting a mid-concentration standard containing only 4,4'-DDT and endrin. Look for the degradation products of 4,4'-DDT (4,4'-DDE and 4,4'-DDD) and endrin (endrin ketone and endrin aldehyde). If degradation of either DDT or endrin exceeds 20%, take corrective action before proceeding with calibration, by following the GC system maintenance outlined in of Method 8000. Calculate percent breakdown as follows:

$$\text{\% breakdown for 4,4'-DDT} = \frac{\text{Total DDT degradation peak area (DDE + DDD)}}{\text{Total DDT peak area (DDT + DDE + DDD)}} \times 100$$

$$\text{\% breakdown for Endrin} = \frac{\text{Total endrin degradation peak area (endrin aldehyde + endrin ketone)}}{\text{Total endrin peak area (endrin + endrin aldehyde + endrin ketone)}} \times 100$$

7.4.6 Record the sample volume injected and the resulting peak sizes (in area units or peak heights).

7.4.7 Using either the internal or external calibration procedure (Method 8000), determine the identity and quantity of each component peak in the sample chromatogram which corresponds to the compounds used for calibration purposes.

7.4.8 If peak detection and identification are prevented due to interferences, the hexane extract may need to undergo cleanup using Method 3620. The resultant extract(s) may be analyzed by GC directly or may undergo further cleanup to remove sulfur using Method 3660.

7.5 Cleanup:

7.5.1 Proceed with Method 3620, followed by, if necessary, Method 3660, using the 10 mL hexane extracts obtained from Section 7.1.2.3.

7.5.2 Following cleanup, the extracts should be analyzed by GC, as described in the previous sections and in Method 8000.

7.5.3 If only PCBs are to be measured in a sample, the sulfuric acid/permanganate cleanup (Method 3665), followed by Silica Cleanup (Method 3630) or Florisil Cleanup (Method 3620), is recommended.

7.6 Calculations (excerpted from U.S. FDA, PAM):

7.6.1 Calculation of Certain Residues: Residues which are mixtures of two or more components present problems in measurement. When they are found together, e.g., toxaphene and DDT, the problem of quantitation becomes even more difficult. In the following sections suggestions are offered for handling toxaphene, chlordane, PCB, DDT, and BHC. A 10% DC-200 stationary phase column was used to obtain the chromatograms in Figures 6-9.

7.6.2 Toxaphene: Quantitative calculation of toxaphene or Strobane is difficult, but reasonable accuracy can be obtained. To calculate toxaphene on GC/ECD: (a) adjust sample size so that toxaphene major peaks are 10-30% full-scale deflection (FSD); (b) inject a toxaphene standard that is estimated to be within ±10 ng of the sample; (c) construct the baseline of standard toxaphene between its extremities; and (d) construct the baseline under the sample, using the distances of the peak troughs to baseline on the standard as a guide (Figures 7, 8, and 9). This procedure is made difficult by the fact that the relative heights and widths of the peaks in the sample will probably not be identical to the standard. A toxaphene standard that has been passed through a Florisil column will show a shorter retention time for peak X and an enlargement of peak Y.

7.6.3 Toxaphene and DDT: If DDT is present, it will superimpose itself on toxaphene peak V. To determine the approximate baseline of the DDT, draw a line connecting the trough of peaks U and V with the trough of peaks W and X and construct another line parallel to this line which will just cut the top of peak W (Figure 6l). This procedure was tested with ratios of standard toxaphene-DDT mixtures from 1:10 to 2:1 and the results of added and calculated DDT and toxaphene by the "parallel lines" method of baseline construction were within 10% of the actual values in all cases.

7.6.3.1 A series of toxaphene residues have been calculated using total peak area for comparison to the standard and also using area of the last four peaks only in both sample and standard. The agreement between the results obtained by the two methods justifies the use of the latter method for calculating toxaphene in a sample where the early eluting portion of the toxaphene chromatogram is interfered with by other substances.

7.6.3.2 The baseline for methoxychlor superimposed on toxaphene (Figure 8b) was constructed by overlaying the samples on a toxaphene standard of approximately the same concentration (Figure 8a) and viewing the charts against a lighted background.

7.6.4 Chlordane is a technical mixture of at least 11 major components and 30 or more minor ones. Gas chromatography-mass spectrometry and nuclear magnetic resonance analytical techniques have been applied to the elucidation of the chemical structures of the many chlordane constituents. Figure 9a is a chromatogram of standard chlordane. Peaks E and F are responses to trans- and cis-chlordane, respectively. These are the two major components of technical chlordane, but the exact percentage of each in the technical material is not completely

defined and is not consistent from batch to batch. Other labelled peaks in Figure 9a are thought to represent: A, monochlorinated adduct of pentachlorocyclopentadiene with cyclopentadiene; B, coelution of heptachlor and α-chlordene; C, coelution of β-chlordene and γ-chlordene; , a chlordane analog; G, coelution of cis-nonachlor and "Compound K," a chlordane isomer. The right "shoulder" of peak F is caused by trans-nonachlor.

7.6.4.1 The GC pattern of a chlordane residue may differ considerably from that of the technical standard. Depending on the sample substrate and its history, residues of chlordane can consist of almost any combination of constituents from the technical chlordane, plant and/or animal metabolites, and products of degradation caused by exposure to environmental factors such as water and sunlight. Only limited information is available on which residue GC patterns are likely to occur in which samples types, and even this information may not be applicable to a situation where the route of exposure is unusual. For example, fish exposed to a recent spill of technical chlordane will contain a residue drastically different from a fish whose chlordane residue was accumulated by ingestion of smaller fish or of vegetation, which in turn had accumulated residues because chlordane was in the water from agricultural runoff.

7.6.4.2 Because of this inability to predict a chlordane residue GC pattern, it is not possible to prescribe a single method for the quantitation of chlordane residues. The analyst must judge whether or not the residue's GC pattern is sufficiently similar to that of a technical chlordane reference material to use the latter as a reference standard for quantitation.

7.6.4.3 When the chlordane residue does not resemble technical chlordane, but instead consists primarily of individual, identifiable peaks, quantitate each peak separately against the appropriate reference materials and report the individual residues. (Reference materials are available for at least 11 chlordane constituents, metabolites or degradation products which may occur in the residue.)

7.6.4.4 When the GC pattern of the residue resembles that of technical chlordane, quantitate chlordane residues by comparing the total area of the chlordane chromatogram from peaks A through F (Figure 9a) in the sample versus the same part of the standard chromatogram. Peak G may be obscured in a sample by the presence of other pesticides. If G is not obscured, include it in the measurement for both standard and sample. If the heptachlor epoxide peak is relatively small, include it as part of the total chlordane area for calculation of the residue. If heptachlor and/or heptachlor epoxide are much out of proportion as in Figure 6j, calculate these separately and subtract their areas from total area to give a corrected chlordane area. (Note that octachlor epoxide, a metabolite of chlordane, can easily be mistaken for heptachlor epoxide on a nonpolar GC column.)

7.6.4.5 To measure the total area of the chlordane chromatogram, proceed as in Section 7.6.2 on toxaphene. Inject an amount of technical chlordane standard which will produce a chromatogram in which peaks E and F are approximately the same size as those in the sample chromatograms. Construct the baseline beneath the standard from the beginning of peak A to the end of peak F as shown in Figure 9a. Use the distance from the trough between peaks E and F to the baseline in the chromatogram of the standard to construct the baseline in the chromatogram of the sample. Figure 9b shows how the presence of toxaphene causes the baseline under chlordane to take an upward angle. When the size of peaks E and F in standard and sample chromatograms are the same, the distance from the trough of the peaks to the baselines should be the same. Measurement of chlordane area should be done by total peak area if possible.

NOTE: A comparison has been made of the total peak area integration method and the addition of peak heights method for several samples containing chlordane. The peak heights A, B, C, D, E, and F were measured in millimeters from peak maximum of each to the baseline constructed under the total chlordane area and were then added together. These results obtained by the two techniques are too close to ignore this method of "peak height addition" as a means of calculating chlordane. The technique has inherent difficulties because not all the peaks are symmetrical and not all are present in the same ratio in standard and in sample. This method does offer a means of calculating results if no means of measuring total area is practical.

7.6.5 Polychlorinated biphenyls (PCBs): Quantitation of residues of PCB involves problems similar to those encountered in the quantitation of toxaphene, Strobane, and chlordane. In each case, the chemical is made up of numerous compounds. So the chromatograms are multi-peak. Also in each case, the chromatogram of the residue may not match that of the standard.

7.6.5.1 Mixtures of PCBs of various chlorine contents were sold for many years in the U.S. by the Monsanto Co. under the tradename Aroclor (1200 series and 1016). Though these Aroclors are no longer marketed, the PCBs remain in the environment and are sometimes found as residues in foods, especially fish.

7.6.5.2 PCB residues are quantitated by comparison to one or more of the Aroclor materials, depending on the chromatographic pattern of the residue. A choice must be made as to which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue. This may also involve a judgment about what proportion of the different Aroclors to combine to produce the appropriate reference material.

7.6.5.3 Quantitate PCB residues by comparing total area or height of residue peaks to total area of height of peaks from appropriate Aroclor(s) reference materials. Measure total area or

height response from common baseline under all peaks. Use only those peaks from the sample that can be attributed to chlorobiphenyls. These peaks must also be present in the chromatogram of the reference materials. Mixtures of Aroclors may be required to provide the best match of GC patterns of sample and reference.

7.6.6 DDT: DDT found in samples often consists of both o,p'- and p,p'-DDT. Residues of DDE and DDD are also frequently present. Each isomer of DDT and its metabolites should be quantitated using the pure standard of that compound and reported as such.

7.6.7 Hexachlorocyclohexane (BHC, from the former name, benzene hexachloride): Technical grade BHC is a cream-colored amorphous solid with a very characteristic musty odor; it consists of a mixture of six chemically distinct isomers and one or more heptachloro-cyclohexanes and octachloro-cyclohexanes.

7.6.7.1 Commercial BHC preparations may show a wide variance in the percentage of individual isomers present. The elimination rate of the isomers fed to rats was 3 weeks for the α-, γ-, and δ-isomers and 14 weeks for the β-isomer. Thus it may be possible to have any combination of the various isomers in different food commodities. BHC found in dairy products usually has a large percentage of β-isomer.

7.6.7.2 Individual isomers (α, β, γ, and δ) were injected into gas chromatographs equipped with flame ionization, microcoulometric, and electron capture detectors. Response for the four isomers is very nearly the same whether flame ionization or microcoulometric GLC is used. The α-, γ-, and δ-isomers show equal electron affinity. β-BHC shows a much weaker electron affinity compared to the other isomers.

7.6.7.3 Quantitate each isomer (α, β, γ, and δ) separately against a standard of the respective pure isomer, using a GC column which separates all the isomers from one another.

8.0 QUALITY CONTROL

8.1 Refer to Chapter One for specific quality control procedures. Quality control to validate sample extraction is covered in Method 3500 and in the extraction method utilized. If extract cleanup was performed, follow the QC in Method 3600 and in the specific cleanup method.

8.2 Quality control required to evaluate the GC system operation is found in Method 8000.

8.2.1 The quality control check sample concentrate (Method 8000) should contain each single-component parameter of interest at the following concentrations in acetone or other water miscible solvent: 4,4'-DDD, 10 mg/L; 4,4'-DDT, 10 mg/L; endosulfan II, 10 mg/L; endosulfan sulfate, 10 mg/L; endrin, 10 mg/L; and any other single-component

pesticide, 2 mg/L. If this method is only to be used to analyze for PCBs, chlordane, or toxaphene, the QC check sample concentrate should contain the most representative multi-component parameter at a concentration of 50 mg/L in acetone.

8.2.2 Table 3 indicates the calibration and QC acceptance criteria for this method. Table 4 gives method accuracy and precision as functions of concentration for the analytes of interest. The contents of both Tables should be used to evaluate a laboratory's ability to perform and generate acceptable data by this method.

8.3 Calculate surrogate standard recovery on all samples, blanks, and spikes. Determine if the recovery is within limits (limits established by performing QC procedures outlined in Method 8000).

8.3.1 If recovery is not within limits, the following is required.

- Check to be sure there are no errors in calculations, surrogate solutions and internal standards. Also, check instrument performance.
- Recalculate the data and/or reanalyze the extract if any of the above checks reveal a problem.
- Reextract and reanalyze the sample if none of the above are a problem or flag the data as "estimated concentration".

8.4 <u>GC/MS confirmation</u>: Any compounds confirmed by two columns may also be confirmed by GC/MS if the concentration is sufficient for detection by GC/MS as determined by the laboratory generated detection limits.

8.4.1 The GC/MS would normally require a minimum concentration of 10 ng/µL in the final extract, for each single-component compound.

8.4.2 The pesticide extract and associated blank should be analyzed by GC/MS as per Section 7.0 of Method 8270.

8.4.3 The confirmation may be from the GC/MS analysis of the base/neutral-acid extractables extracts (sample and blank). However, if the compounds are not detected in the base/neutral-acid extract even though the concentration is high enough, a GC/MS analysis of the pesticide extract should be performed.

8.4.4 A reference standard of the compound must also be analyzed by GC/MS. The concentration of the reference standard must be at a level that would demonstrate the ability to confirm the pesticides/PCBs identified by GC/ECD.

9.0 METHOD PERFORMANCE

9.1 The method was tested by 20 laboratories using organic-free reagent water, drinking water, surface water, and three industrial wastewaters spiked at

six concentrations. Concentrations used in the study ranged from 0.5 to 30 µg/L for single-component pesticides and from 8.5 to 400 µg/L for multi-component parameters. Single operator precision, overall precision, and method accuracy were found to be directly related to the concentration of the parameter and essentially independent of the sample matrix. Linear equations to describe these relationships for an electron capture detector are presented in Table 4.

9.2 The accuracy and precision obtained will be determined by the sample matrix, sample-preparation technique, optional cleanup techniques, and calibration procedures used.

10.0 REFERENCES

1. U.S. EPA, "Development and Application of Test Procedures for Specific Organic Toxic Substances in Wastewaters, Category 10: Pesticides and PCBs," Report for EPA Contract 68-03-2605.

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8. Millar, J.D., R.E. Thomas and H.J. Schattenberg, "EPA Method Study 18, Method 608: Organochlorine Pesticides and PCBs," U.S. EPA/EMSL, Research Triangle Park, NC, EPA-600/4-84-061, 1984.

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TABLE 1.
GAS CHROMATOGRAPHY OF PESTICIDES AND PCBs[a]

Analyte	Retention time (min) Col. 1	Col. 2	Method Detection limit (μg/L)
Aldrin	2.40	4.10	0.004
α-BHC	1.35	1.82	0.003
β-BHC	1.90	1.97	0.006
δ-BHC	2.15	2.20	0.009
γ-BHC (Lindane)	1.70	2.13	0.004
Chlordane (technical)	e	e	0.014
4,4′-DDD	7.83	9.08	0.011
4,4′-DDE	5.13	7.15	0.004
4,4′-DDT	9.40	11.75	0.012
Dieldrin	5.45	7.23	0.002
Endosulfan I	4.50	6.20	0.014
Endosulfan II	8.00	8.28	0.004
Endosulfan sulfate	14.22	10.70	0.066
Endrin	6.55	8.10	0.006
Endrin aldehyde	11.82	9.30	0.023
Heptachlor	2.00	3.35	0.003
Heptachlor epoxide	3.50	5.00	0.083
Methoxychlor	18.20	26.60	0.176
Toxaphene	e	e	0.24
PCB-1016	e	e	nd
PCB-1221	e	e	nd
PCB-1232	e	e	nd
PCB-1242	e	e	0.065
PCB-1248	e	e	nd
PCB-1254	e	e	nd
PCB-1260	e	e	nd

[a]U.S. EPA. Method 617. Organochlorine Pesticides and PCBs. Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268.

e = Multiple peak response.

nd = not determined.

TABLE 2.
DETERMINATION OF ESTIMATED QUANTITATION LIMITS (EQLs) FOR VARIOUS MATRICES[a]

Matrix	Factor[b]
Ground water	10
Low-concentration soil by sonication with GPC cleanup	670
High-concentration soil and sludges by sonication	10,000
Non-water miscible waste	100,000

a Sample EQLs are highly matrix-dependent. The EQLs listed herein are provided for guidance and may not always be achievable.

b EQL = [Method detection limit (Table 1)] X [Factor (Table 2)]. For non-aqueous samples, the factor is on a wet-weight basis.

TABLE 3.
QC ACCEPTANCE CRITERIA[a].

Analyte	Test conc. (µg/L)	Limit for s (µg/L)	Range for $\bar{x}$ (µg/L)	Range P, P_s (%)
Aldrin	2.0	0.42	1.08-2.24	42-122
α-BHC	2.0	0.48	0.98-2.44	37-134
β-BHC	2.0	0.64	0.78-2.60	17-147
δ-BHC	2.0	0.72	1.01-2.37	19-140
γ-BHC	2.0	0.46	0.86-2.32	32-127
Chlordane	50	10.0	27.6-54.3	45-119
4,4'-DDD	10	2.8	4.8-12.6	31-141
4,4'-DDE	2.0	0.55	1.08-2.60	30-145
4,4'-DDT	10	3.6	4.6-13.7	25-160
Dieldrin	2.0	0.76	1.15-2.49	36-146
Endosulfan I	2.0	0.49	1.14-2.82	45-153
Endosulfan II	10	6.1	2.2-17.1	D-202
Endosulfan Sulfate	10	2.7	3.8-13.2	26-144
Endrin	10	3.7	5.1-12.6	30-147
Heptachlor	2.0	0.40	0.86-2.00	34-111
Heptachlor epoxide	2.0	0.41	1.13-2.63	37-142
Toxaphene	50	12.7	27.8-55.6	41-126
PCB-1016	50	10.0	30.5-51.5	50-114
PCB-1221	50	24.4	22.1-75.2	15-178
PCB-1232	50	17.9	14.0-98.5	10-215
PCB-1242	50	12.2	24.8-69.6	39-150
PCB-1248	50	15.9	29.0-70.2	38-158
PCB-1254	50	13.8	22.2-57.9	29-131
PCB-1260	50	10.4	18.7-54.9	8-127

s = Standard deviation of four recovery measurements, in µg/L.

$\bar{x}$ = Average recovery for four recovery measurements, in µg/L.

P, P_s = Percent recovery measured.

D = Detected; result must be greater than zero.

[a]Criteria from 40 CFR Part 136 for Method 608. These criteria are based directly upon the method performance data in Table 4. Where necessary, the limits for recovery have been broadened to assure applicability of the limits to concentrations below those used to develop Table 4.

TABLE 4.
METHOD ACCURACY AND PRECISION AS FUNCTIONS OF CONCENTRATION[a]

Analyte	Accuracy, as recovery, x′ (μg/L)	Single analyst precision, s_r' (μg/L)	Overall precision, S′ (μg/L)
Aldrin	0.81C+0.04	0.16$\bar{x}$-0.04	0.20$\bar{x}$-0.01
α-BHC	0.84C+0.03	0.13$\bar{x}$+0.04	0.23$\bar{x}$-0.00
β-BHC	0.81C+0.07	0.22$\bar{x}$+0.02	0.33$\bar{x}$-0.95
δ-BHC	0.81C+0.07	0.18$\bar{x}$+0.09	0.25$\bar{x}$+0.03
γ-BHC	0.82C-0.05	0.12$\bar{x}$+0.06	0.22$\bar{x}$+0.04
Chlordane	0.82C-0.04	0.13$\bar{x}$+0.13	0.18$\bar{x}$+0.18
4,4′-DDD	0.84C+0.30	0.20$\bar{x}$-0.18	0.27$\bar{x}$-0.14
4,4′-DDE	0.85C+0.14	0.13$\bar{x}$+0.06	0.28$\bar{x}$-0.09
4,4′-DDT	0.93C-0.13	0.17$\bar{x}$+0.39	0.31$\bar{x}$-0.21
Dieldrin	0.90C+0.02	0.12$\bar{x}$+0.19	0.16$\bar{x}$+0.16
Endosulfan I	0.97C+0.04	0.10$\bar{x}$+0.07	0.18$\bar{x}$+0.08
Endosulfan II	0.93C+0.34	0.41$\bar{x}$-0.65	0.47$\bar{x}$-0.20
Endosulfan Sulfate	0.89C-0.37	0.13$\bar{x}$+0.33	0.24$\bar{x}$+0.35
Endrin	0.89C-0.04	0.20$\bar{x}$+0.25	0.24$\bar{x}$+0.25
Heptachlor	0.69C+0.04	0.06$\bar{x}$+0.13	0.16$\bar{x}$+0.08
Heptachlor epoxide	0.89C+0.10	0.18$\bar{x}$-0.11	0.25$\bar{x}$-0.08
Toxaphene	0.80C+1.74	0.09$\bar{x}$+3.20	0.20$\bar{x}$+0.22
PCB-1016	0.81C+0.50	0.13$\bar{x}$+0.15	0.15$\bar{x}$+0.45
PCB-1221	0.96C+0.65	0.29$\bar{x}$-0.76	0.35$\bar{x}$-0.62
PCB-1232	0.91C+10.79	0.21$\bar{x}$-1.93	0.31$\bar{x}$+3.50
PCB-1242	0.91C+10.79	0.21$\bar{x}$-1.93	0.31$\bar{x}$+3.50
PCB-1248	0.91C+10.79	0.21$\bar{x}$-1.93	0.31$\bar{x}$+3.50
PCB-1254	0.91C+10.79	0.21$\bar{x}$-1.93	0.31$\bar{x}$+3.50
PCB-1260	0.91C+10.79	0.21$\bar{x}$-1.93	0.31$\bar{x}$+3.50

x′ = Expected recovery for one or more measurements of a sample containing concentration C, in μg/L.

s_r' = Expected single analyst standard deviation of measurements at an average concentration of $\bar{x}$, in μg/L.

S′ = Expected interlaboratory standard deviation of measurements at an average concentration found of $\bar{x}$, in μg/L.

C = True value for the concentration, in μg/L.

$\bar{x}$ = Average recovery found for measurements of samples containing a concentration of C, in μg/L.

Figure 1
Gas Chromatogram of Pesticides

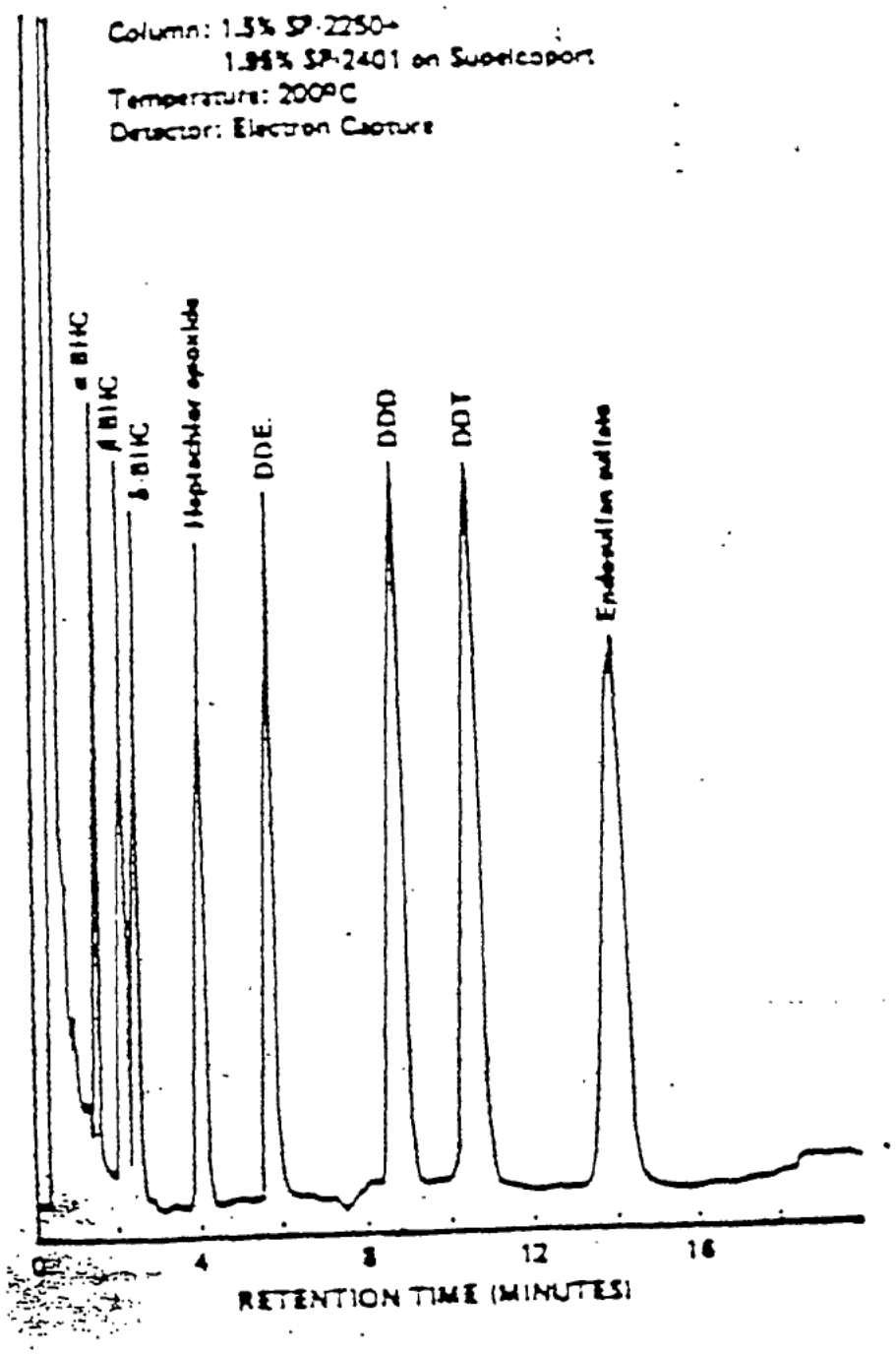


Figure 2
Gas Chromatogram of Chlordane

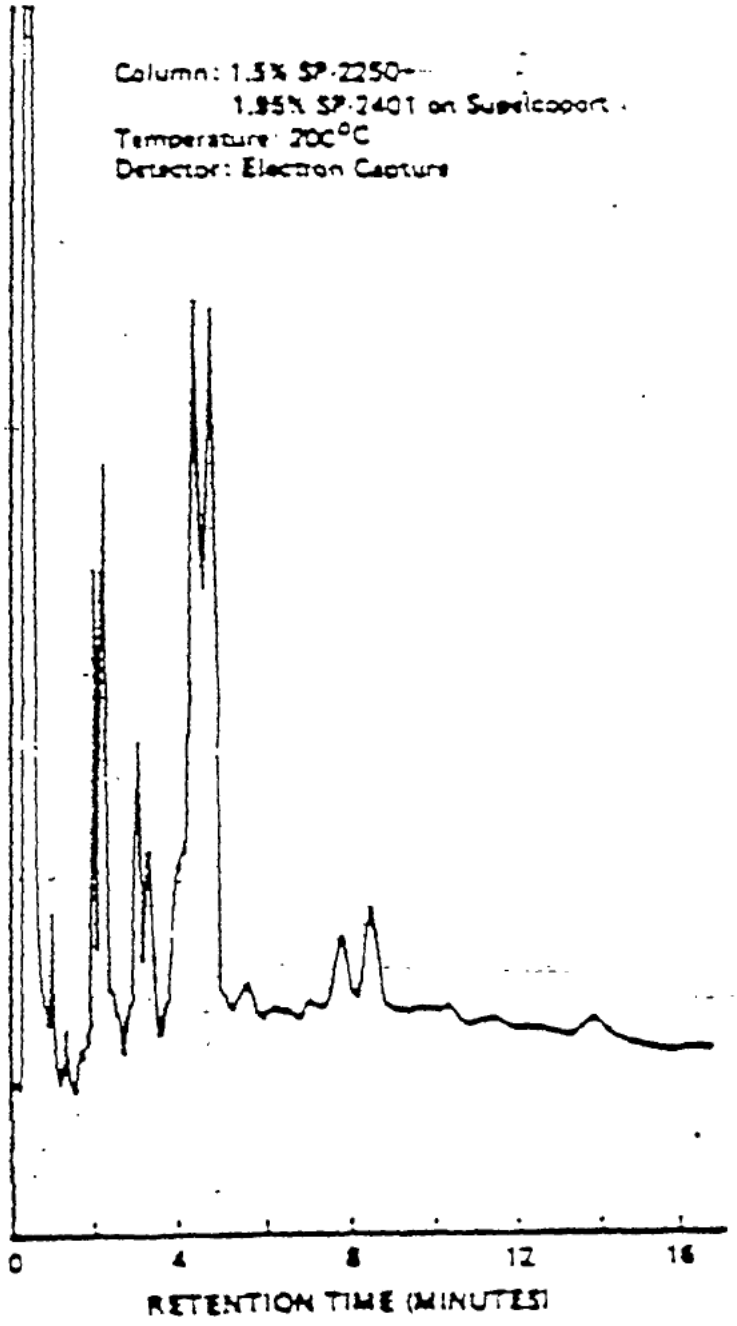


Figure 3
Gas Chromatogram of Toxaphene

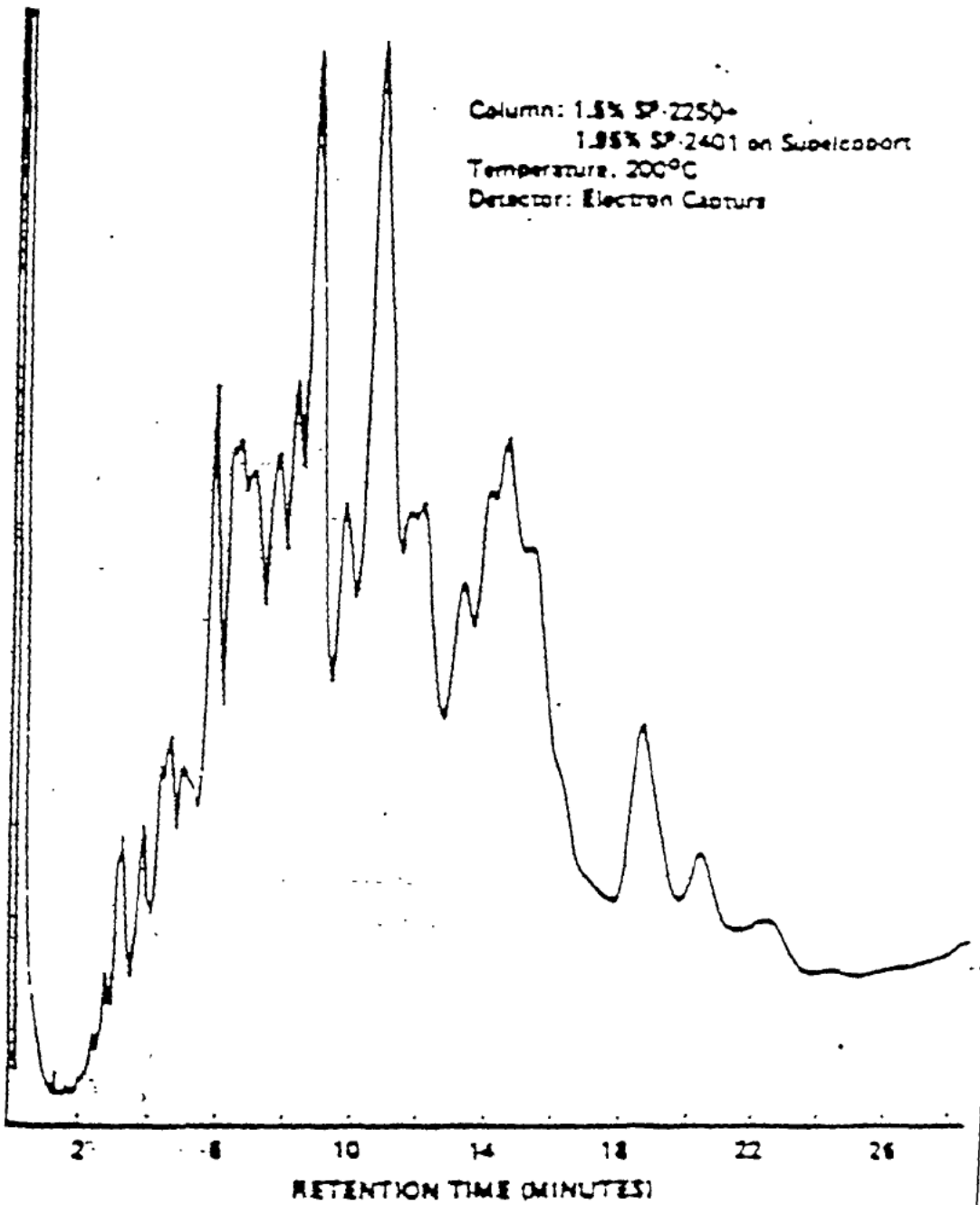


Figure 4
Gas Chromatogram of Aroclor 1254

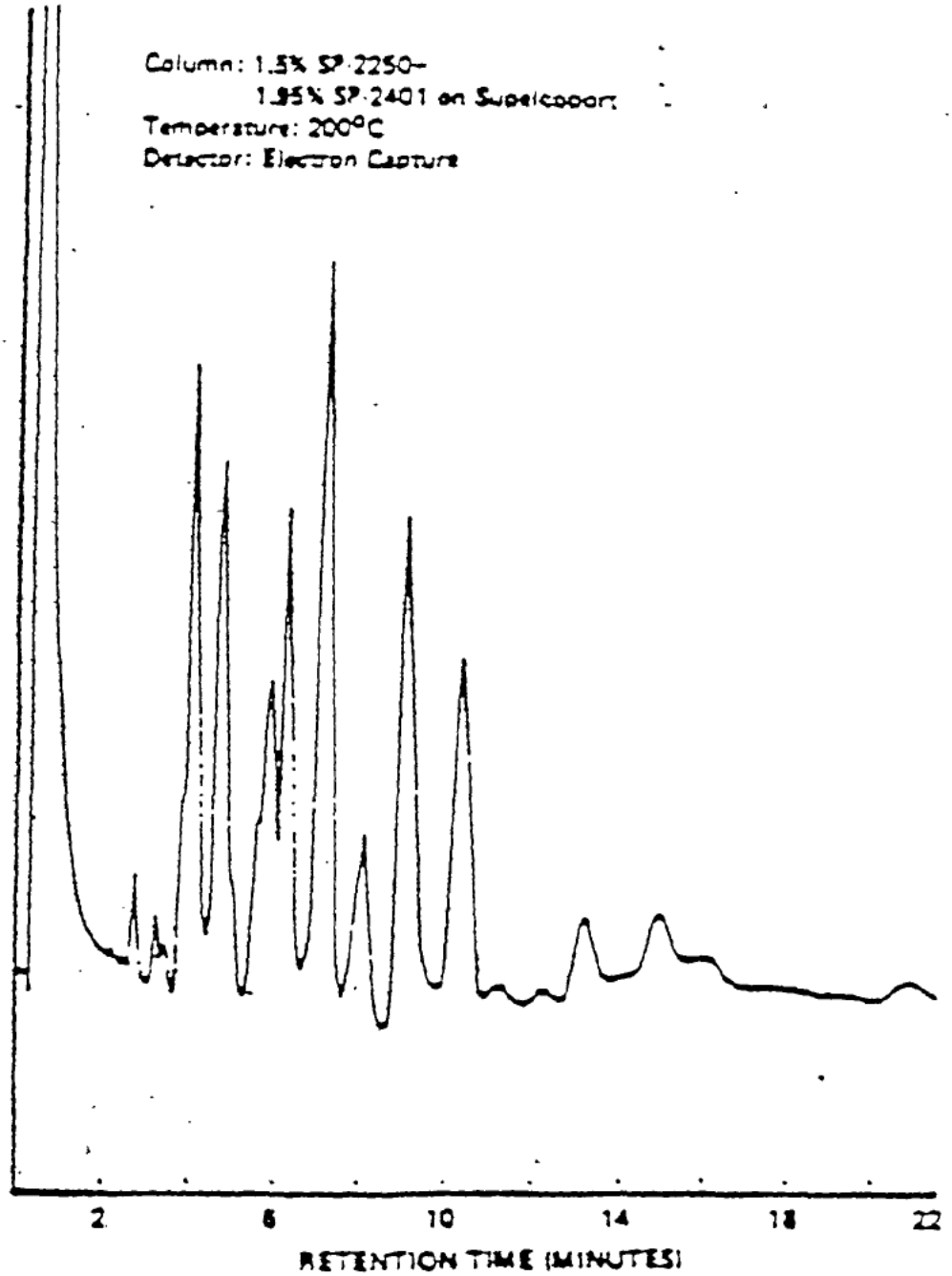


Figure 5
Gas Chromatogram of Aroclor 1260

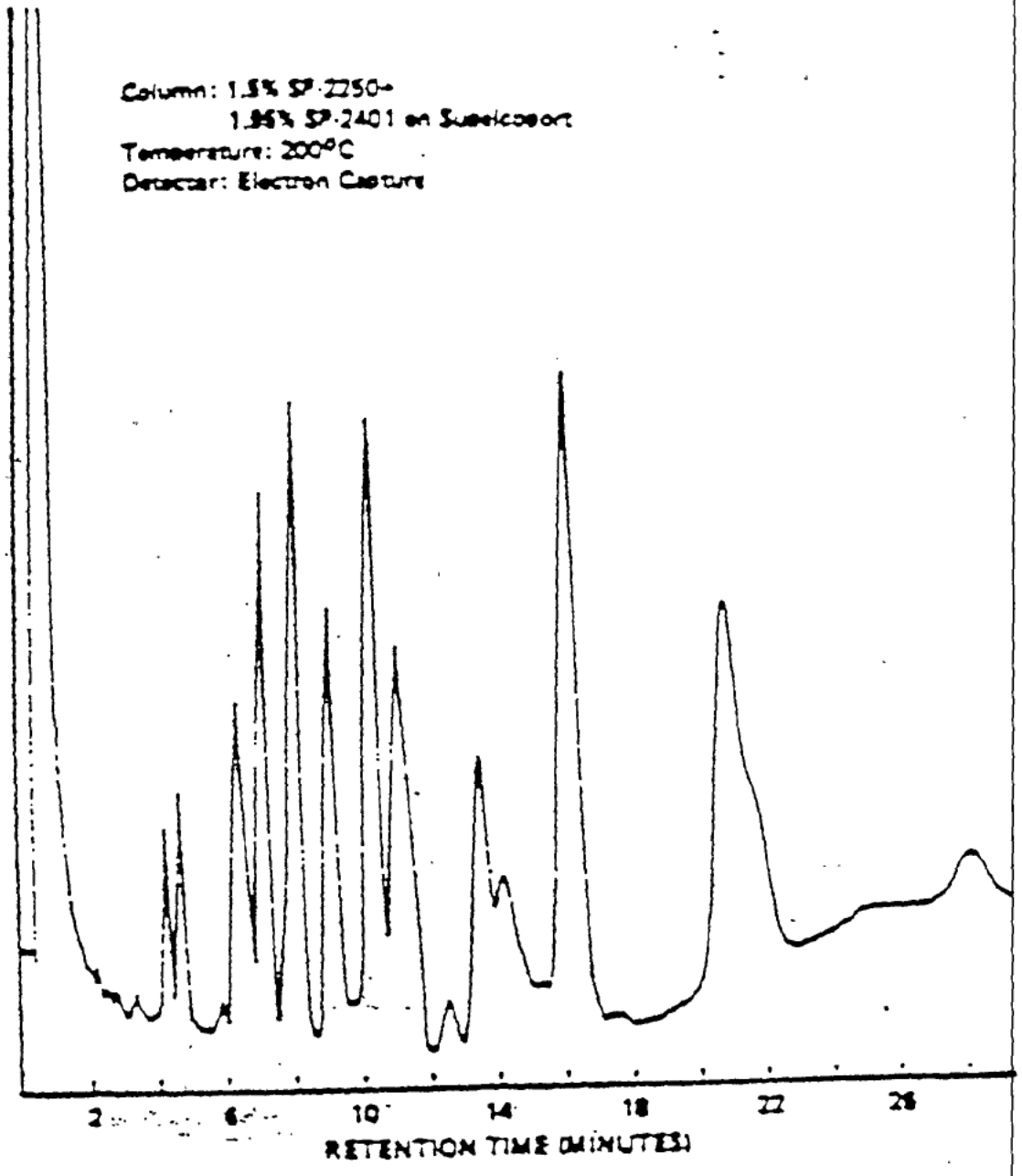


Figure 6

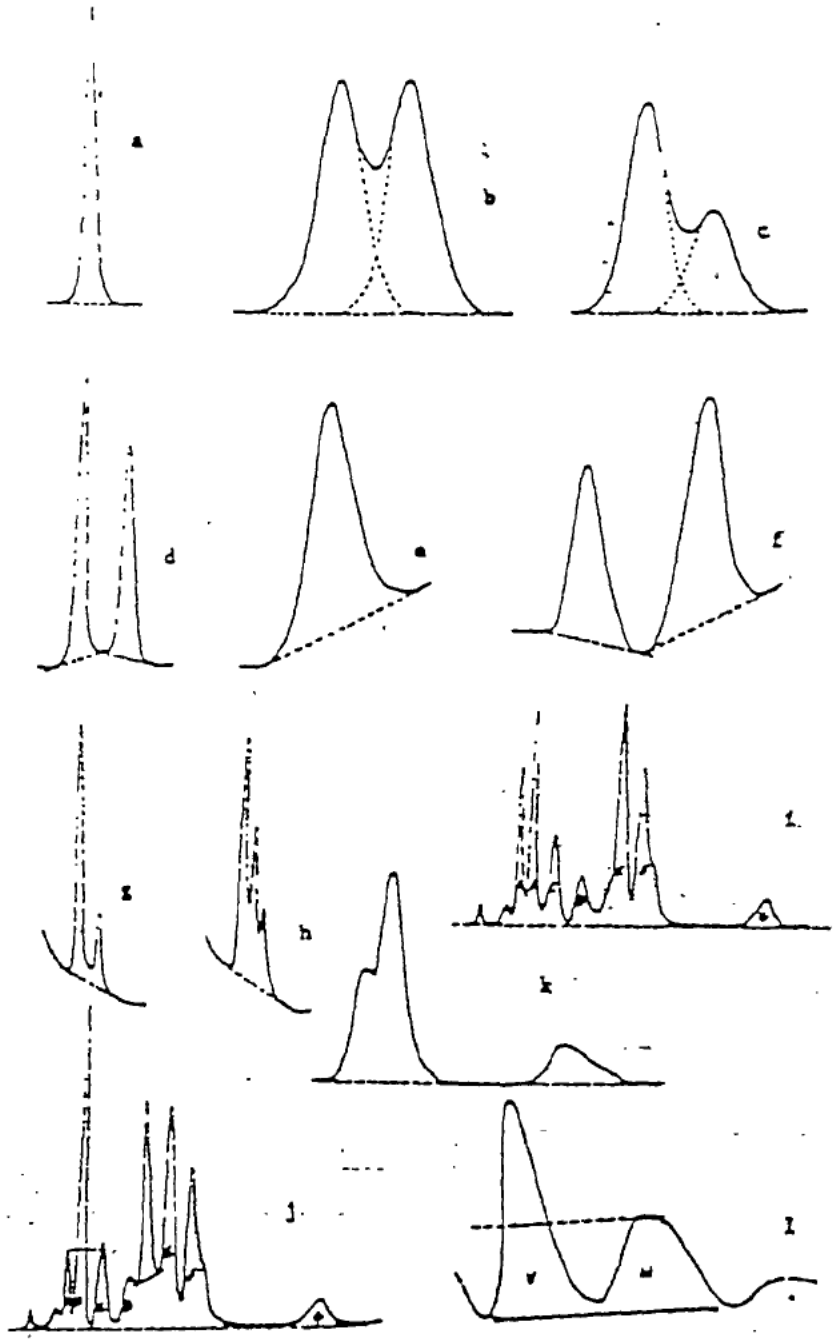


FIG. 6—Baseline construction for some typical gas chromatographic peaks. a, symmetrical separated flat baseline; b and c, overlapping flat baseline; d, separated (pen does not recurn to baseline between peaks); e, separated sloping baseline; f, separated (pen goes below baseline between peaks); g, α- and γ-BHC sloping baseline; h, α-, β-, and γ-BHC sloping baseline; i, chlordane flat baseline; j, heptachlor and heptachlor epoxide superimposed on chlordane; k, chair-shaped peaks, unsymmetrical peak; l, p,p'-DDT superimposed on toxaphene.

Figure 7

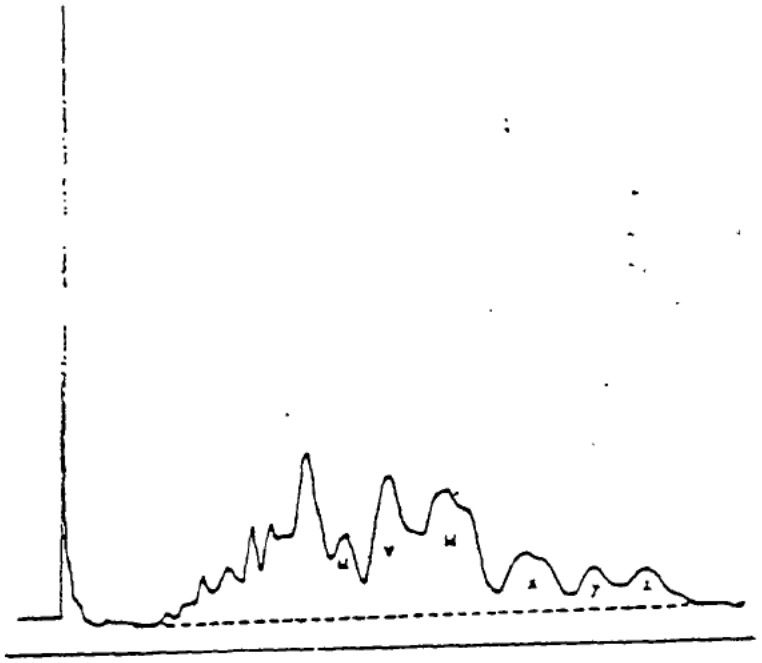


Fig. 7a—Baseline construction for multiple residues with standard toxaphene.

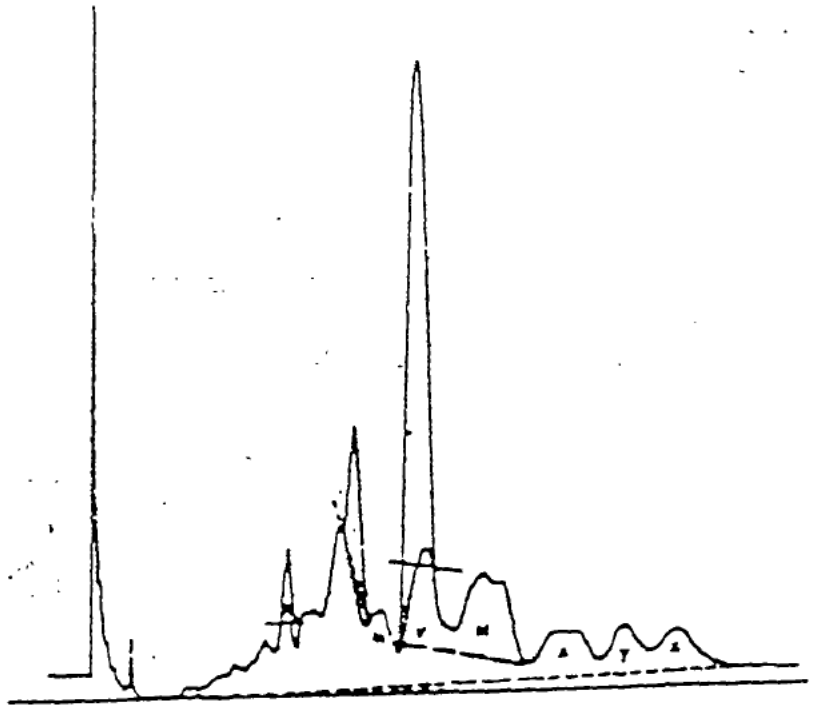


Fig. 7b—Baseline construction for multiple residues with toxaphene, DDE and o,p'-, and p,p'-DDT.

Figure 8

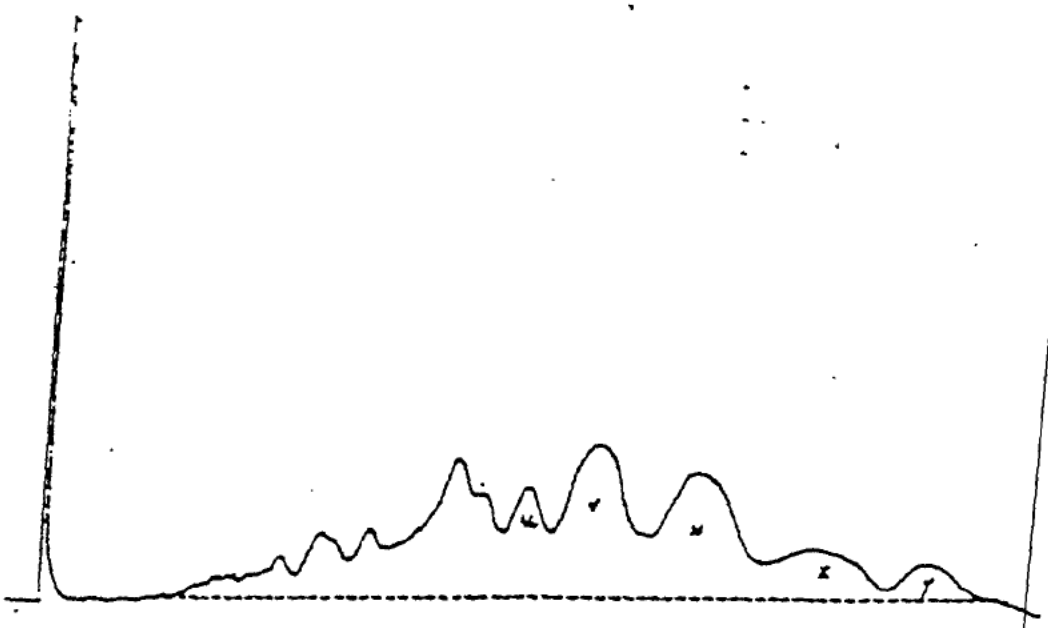


Fig. 8a—Baseline construction for multiple residues: standard toxaphene.

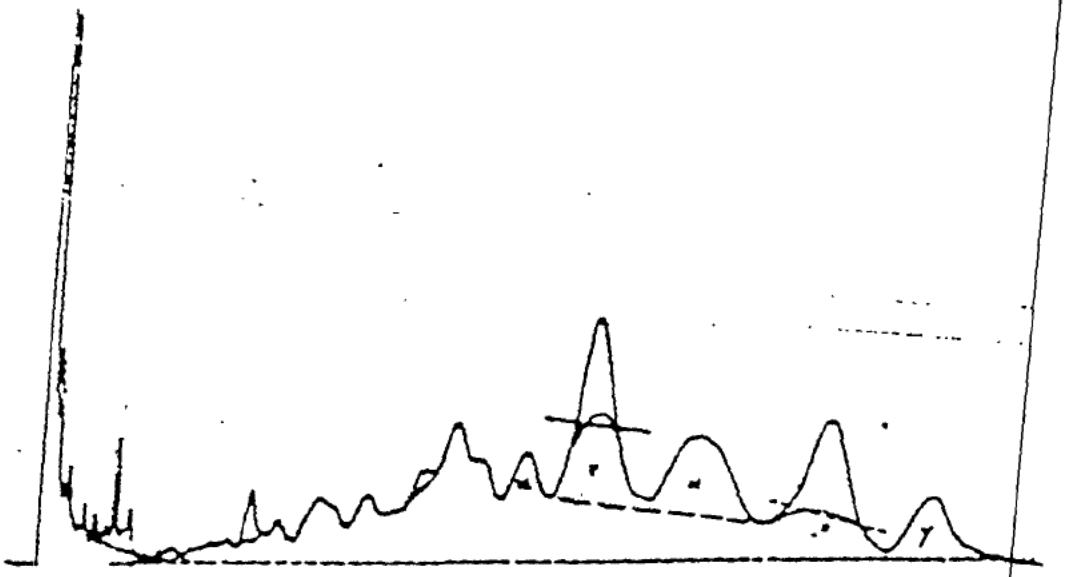


Fig. 8b—Baseline construction for multiple residues: rice bran with BHC, toxaphene, DDT, and methoxychlor.

Figure 19

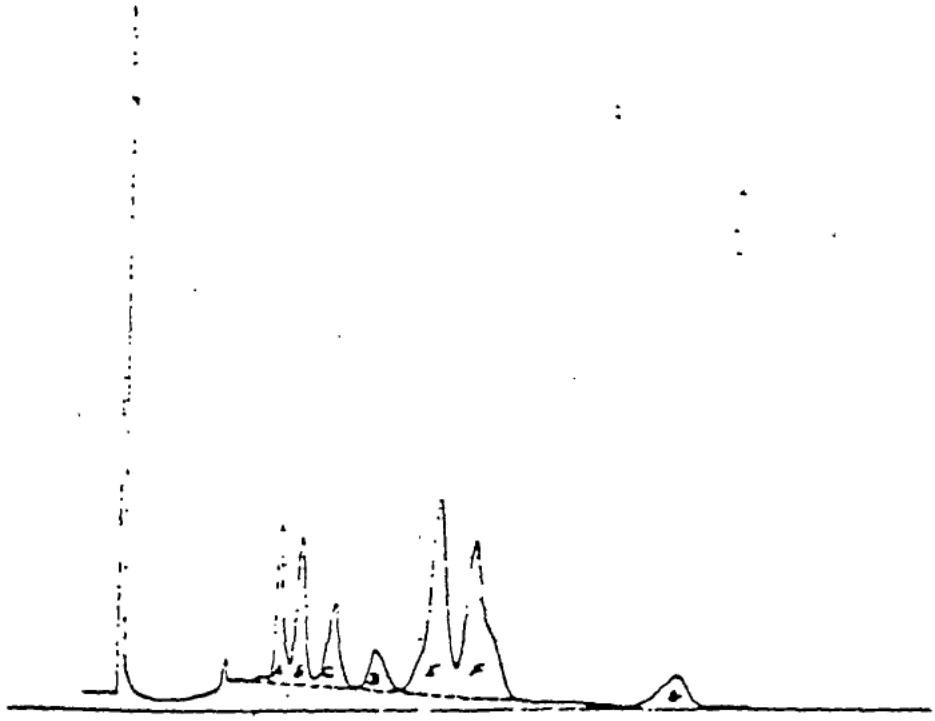


Fig. 8a—Baseline construction for multiple residues: standard chlordane.

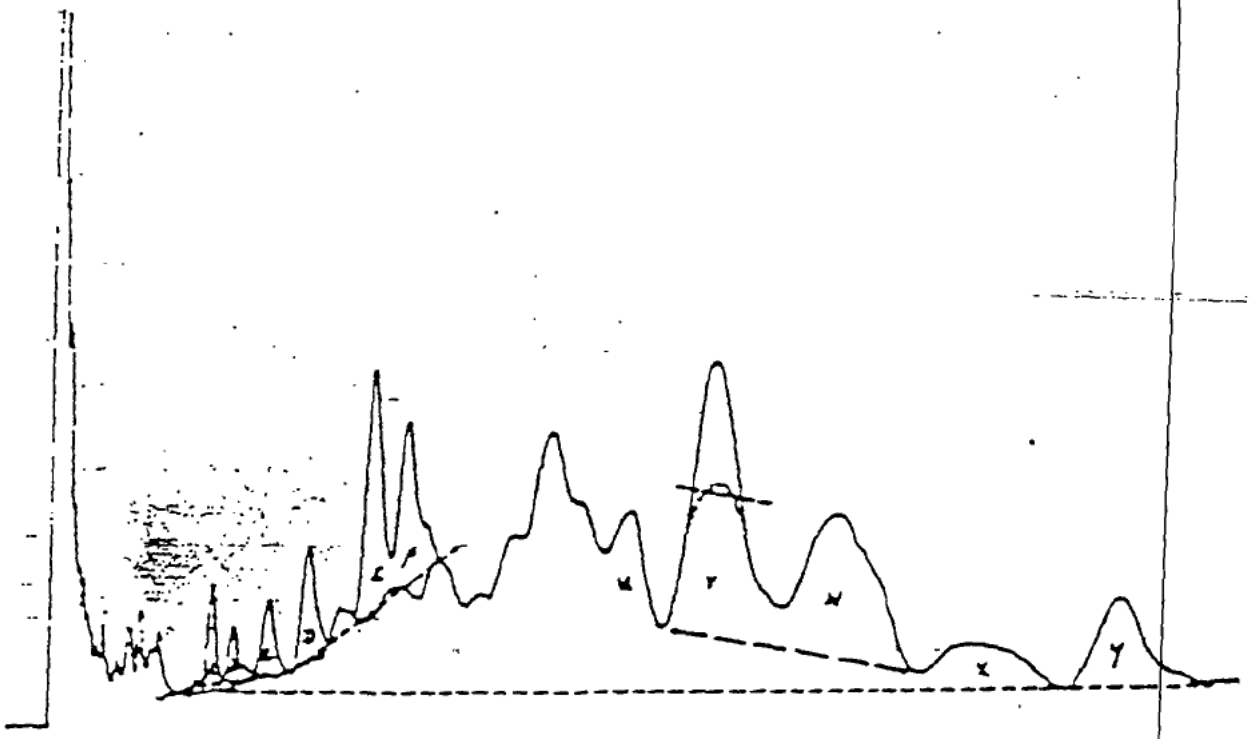
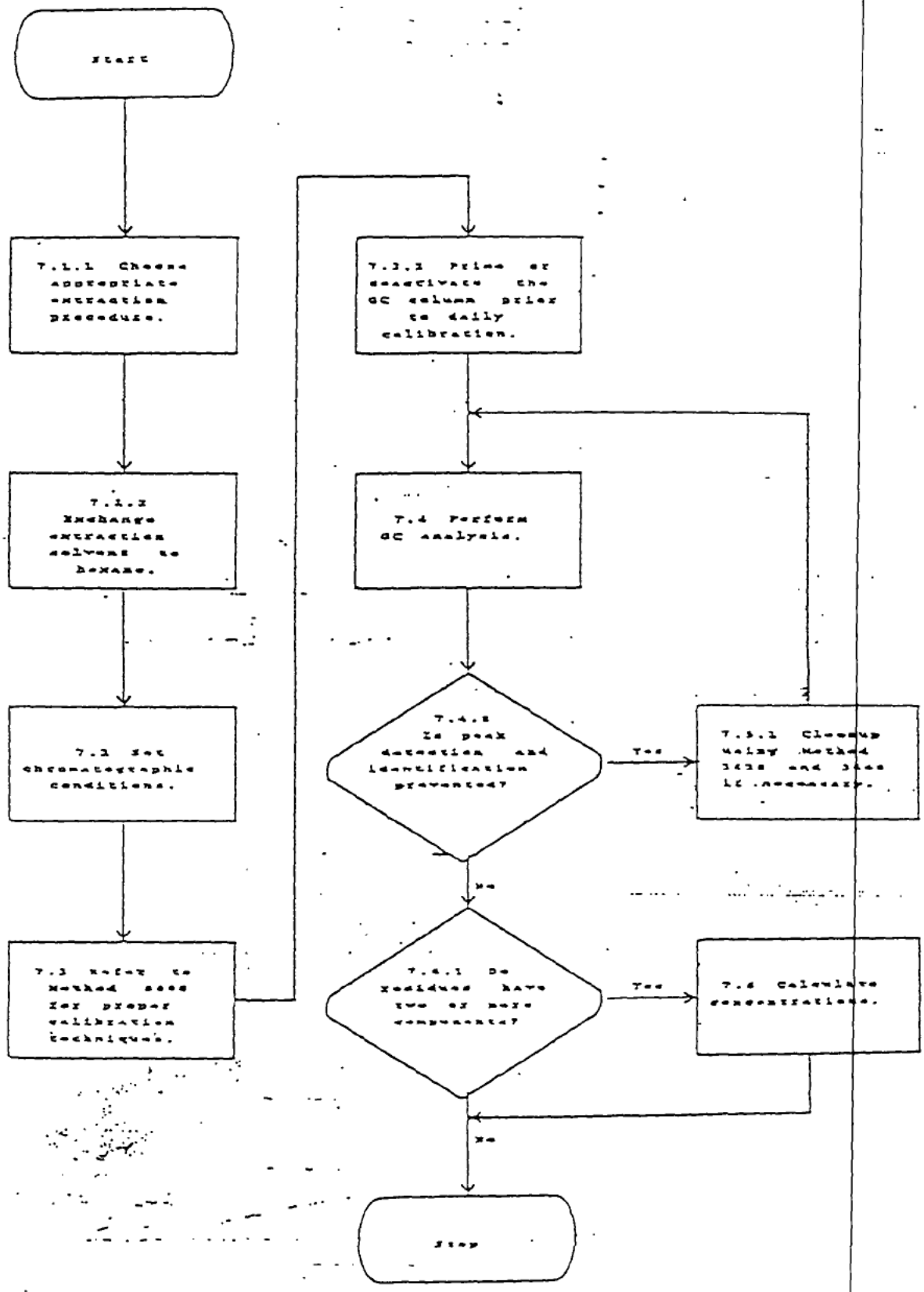


Fig. 8b—Baseline construction for multiple residues: rice bran with chlordane, toxaphene, and DDT.

METHOD 8080A
ORGANOCHLORINE PESTICIDES AND POLYCHLORINATED BIPHENYLS BY GAS CHROMATOGRAPHY



Vickery Site Specific

Procedure

SW846, Method 8080A
Polychiorinated Biphenyls (PCBs)

by

Gas Chromatography

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7.0 PROCEDURE

7.1.1 Refer to Chapter Two for guidance on choosing the appropriate extraction procedure. In general, water samples are extracted at the pH the sample is received with methylene chloride, using either Method 3510C, with Vickery Site Specific Procedure of SW846-3510C, or other appropriate procedure. Solid samples are extracted using Method 3540C or 3550C.

8.0 QUALITY CONTROL

8.3.1 If recovery is not within in-house surrogate limits, refer to Section 8.6.2, Method 8000B of 5W846, Revision 2, December 1996 with Vickery Site Specific Procedure, SSP-8000B.

Vickery Site Specific

Procedure

5W846, Method 8000B

Determinative Chromatographic Separations

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8.0 QUALITY CONTROL

8.6.2.4 If no instrument problem is found, QC and spike samples are within in-house limits, and no low or high trend in surrogate recoveries is apparent, then no further action is required.

8.6.2.5 If a trend is apparent, further investigation is needed to determine if it is related to the sample matrix, to a dilution error, or to an analyst error,

8.6.2.5.1 If consistent within the matrix, problem should be noted and no further action is needed.

8.6.2.5.2 If a dilution error, the sample should be extracted and re-analyzed.

8.6.2.5.3 If analyst error, analyst should be retrained.

8.6.2.6 If upon re-analysis, the recovery is again not within limits, report the data as an "estimated concentration." If the recovery is within the limits in the re-analysis, provide the results of original and the re-analyzed in the data.

Vickery Facility	Method No. 97-71 Date 12/29/97
3956 State Route 412	Supersedes 92-71 Page 1 of 2
Vickery, Ohio 43464	Approval Barbara Hill Date 12/29/97

METHOD MODIFICATION

ASTM METHOD D 4980-89

SCREENING OF pH IN WASTE

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1.0 SCOPE AND APPLICATION

1.6 This method modification is only applicable to waste samples, solids, sludges and non-aqueous liquids. The standard ASTM test method must be used for aqueous samples and discharge waters

21.0 PROCEDURE

21.2 Thoroughly rinse and gently wipe the electrodes prior to measuring pH of each sample. Immerse the electrodes into the sample beaker or sample stream and gently stir at a constant rate to provide homogeneity and suspension of solids. Note and record sample pH and temperature. Wait for a least 15 seconds. If the sample pH value drifts by more than 0.5 pH unit, repeat the measurement on additional aliquots of sample until a constant pH is obtained.

Method Modification

ASTM D 5928

Standard Test Method

for

Screening of Waste for Radioactivity

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4.0 Summary of Test Method

4.1 A sample is held 1 inch from the detector window of a radiation survey meter, and the visible or audible reaction of the meter, or both is noted. The result of the meter's reaction is noted as either "negative" or "positive."

9.0 Sample

9.1 Liquid samples exhibiting stratification will be thoroughly mixed in the original, closed container prior to testing. Solid samples of a heterogeneous nature may be subsampled to assure a representative portion. The test portion is spread out onto a watch glass prior to screening to increase the surface area being scanned and enhance the ability of the meter to detect any radiation being emitted.

10.0 Calibration and Standardization

10.2 Check the survey meter's performance at least daily using the Cs 137 source.

10.2.1 Set selector switch to X1 setting.

10.2.2 Place the cesium source at approximately one inch, three inches and nine inches from the detector. Record the responses.

10.3 The survey meter should be factory calibrated whenever detector readings from daily Cs check do not exhibit expected results. Counts should decrease in proportion to the distance from the source.

Example: If the detector yields 10,000 counts at 3 inches, then it should yield approximately 100 counts at 9 inches.

OR

Approximate counts at specified distances are not repeatable and no other assignable cause can be found. A survey meter should be sent to the manufacturer for recalibration every 3 to 5 years even if no faulty behaviors have been noted.

10.4 Assess the level of ambient background radiation annually. Data should be collected over multiple days to ensure randomness of background levels.

10.6 The criteria used to report "negative" or "positive" test results are as follows:

10.6.1 Negative is defined as equal to the background reading. The result may be expressed as "negative," "neg," "= background," or "= bkg."

10.6.2 Positive is defined as greater than background reading. The result may be expressed as "positive," "pos," "> background," or "> bkg."

10.6.2.1 Any positive result must be reported to supervisory personnel immediately.

10.6.2.2 Instrument performance will be checked, possible interferences will be investigated and repeat testing will be undertaken to ensure the result.

11.0 Procedure

11.3 Place the end-window of the survey meter at approximately 1 inch from the sample. Depending on the physical characteristics of the sample container (for example, the container is such that the sample is > one inch from the opening), it may be necessary to withdraw a representative portion of the sample to an alternate container, watch glass, or other appropriate vessel to allow the end-window to be placed at approximately one inch from the sample. Do not allow the survey meter to come in direct contact with the sample. This may contaminate the meter and may damage the end-window.

11.4 Note the counts for at least 5 seconds, record results as per the definitions of "negative" and "positive."

ACID WASTE REACTIVITY BY

POTENTIOMETRIC TITRATION

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1.0 SCOPE AND APPLICATION

1.1 This method is used to address a specific acid waste reactivity problem related to potential nitrogen oxide evolution during deep well process operations.

1.2 The method determines the critical blend ratio of process wastes.

1.2.1 The critical blend ratio is defined as the ratio of the volume of received waste to the volume of blend tank waste.

1.2.2 The test is oriented for situations where the received load is an oxidizing acid and the waste tank blend is a reducing acid.

1.3 The method is applicable to acids including spent pickle liquors, plating and process residues received by deep well disposal sites.

1.3.1 Reducing wastes are usually hydrochloric acid based and may contain some organic reductants or sulfuric acid.

1.3.2 Oxidizing wastes are usually nitric acid based, but may also contain perchloric acid.

1.4 The method generates guideline data. Other information including tank volumes, prior received loads and site specific operational practices must be taken into consideration when interpreting the critical ratio data.

1.5 This method is a subset of, not a substitute for, the compatibility screen, ASTM D5058-90, which must be performed first.

2.0 SUMMARY OF METHOD

2.1 A sample of the current waste tank blend is titrated with an acid sample from the received load, using a platinum-silver chloride electrode set, to a potentiornetric endpoint of 610 mv or to a 1:1 volumetric ratio.

3.0 INTERFERENCES

3.1 Samples which contain oil may coat the electrodes and prevent the electrode pair from reaching equilibrium.

4.0 APPARATUS AND MATERIALS

4 1 Potentiometer, covering the voltage range of ±2000 millivolts. Corning Model 7, or equivalent.

4.2 Electrode, indicator, Orion platinum probe.

4.3 Electrode reflating kit, Orion Co.

4.4 Electrode, reference, Orion silver/silver chloride.

4.5 Beaker, glass, 400 ml.

4.6 Piped, automatic 10 ml volume.

4.7 Magnetic Stirrer and stirring bar.

4.8 Flask, Volumetric, 1L.

4.9 Graduated Cylinder, 100 ml.

5.0 REAGENTS

5.1 Reagent Water - Reagent water is defined as water in which an interference is not observed at, or above, the method detection limits (MDLs) of the analyte(s) of interest. Typically, double deionized water with electrical resistivity Of> 1.0 Mohms-cm at 25°C or electrical conductivity of < 1.0 microsiemens/cm at 25°C is used.

5.2 Reference Solution - ASTM D-1498 Section 7.8. Dissolving 39.21 g of ferrous ammonium sulfate, 48.22 g of ferric ammonium sulfate and 56.2 ml of sulfuric acid in water and dilute to 1L.

6.0 SAMPLE PREPARATION, HANDLING AND STORAGE

6.1 Each sample must be analyzed immediately upon receipt in the laboratory.

6.2 If the sample remains in the laboratory for more than 15 minutes the data may be inaccurate.

7.1 Obtain a current sample of the appropriate waste tank blend.

7.2 Place the indicating and reference electrodes into the sample jar containing the waste. Measure and record the electrode potential in millivolts.

7.2.1 If this voltage is less than 610 millivolts, the test is considered positive and the waste can be processed in the appropriate manner.

7.2.2 If this voltage is greater than 610 millivolts, proceed with the method.

7.3 Transfer 100 ml of the received waste to a 400 ml beaker. Add the stirring bar, place on the stirring plate, begin stirring.

7.4 Place the electrodes into the solution. Measure and record the electrode potential.

7.5 Add 10 ml aliquots of the waste tank blend and record the electromotive potential.

7.6 Continue adding aliquots until the electrode potential exceeds 610 millivolts or 100 ml of the waste tank blend has been added. Record the number of aliquots added to the beaker.

7.7 Wash the electrodes carefully with reagent water. If there is any oily residue on the electrodes rinse with an appropriate solvent such as xylene, hexane, isopropanol etc. to remove the oil.

7.8 When not in use keep the electrodes immersed in reagent water.

8.0 CALCULATIONS

8.1 Calculate the critical blending ratio using the following equation:

$$C = 100/(10A)$$

Where:

A = The number of 10 ml aliquots added to the beaker.
C = The critical blending ratio
10 = The volume of the aliquot of waste tank blend, ml
100 = The volume of received waste, ml.

9.0 QUALITY ASSURANCE

9.1 Each morning measure the electrode potential using reagent water.

9.2 Each morning, or any time the electrodes are disconnected from the instrument, measure the electrode potential of the hydrochloric acid reference solution. The reading should be about +365 mV.

9.3 ASTM D-1498 Section 10.2. Verify the sensitivity of the electrodes by noting the change in mV reading when the pH is altered. The Oxidation-Reduction Potential will increase when the pH decreases and decrease when the pH increases.

9.4 If there is a significant deviation from + or - response performance, replatinize the platinum electrode according to the manufacturer's instructions.

9.5 Perform a duplicate analysis on every twentieth sample analyzed.

9.6 The precision of the test should be within +10%.

10.0 REFERENCES

10.1 ASTM Method 1498-93, Standard Practice for Oxidation-Reduction Potential of Water, Annual Book of Standards, Vol.11.01, 1993.

Vickery Facility
3956 State Route 412
Vickery, Ohio 43464

Method No. 97-02 Date 12/11/97
Supersedes 95-02 Page 1 of 5
Approval Barbara Hill Date 12/11/97

Method Modification
ASTM D5830

Standard Test Method

for

Solvents Analysis in Hazardous Waste

Using Gas Chromatography

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8.0 Standard Preparation

8.1 Stock Standard Solutions

8.1.1 Stock standards are prepared from pure standard materials.

8.1.2 It is recommended that each component is 5 to 10% by weight.

8.1.2.1 For volatile components, such as ether and freons, it is recommended that a new stock standard be prepared daily or as needed.

8.1.3 The standard compounds must correspond to the compound list specified in the site specific practice (SSP).

8.3 Calibration Check Standard

8.3.1 A calibration check standard should be prepared from at least ten compounds.

8.3.2 The compounds should cover the major compound types, i.e., alcohols, aromatics, ketones, halogenates, etc.

8.3.3 The calibration check standard must include the following five compounds:

1,1,1 -Trichloroethane	Ethylbenzene
Chloroform	p-Xylene
Methyl Isobutyl Ketone	

8.3.4 The actual calibration check standard must be specified in an SSP and must cover the range of compound types analyzed.

10.0 Procedure

10.1 Sample Preparation

10.1.1 Carbon disulfide or M-Pyrol Preparation

10.1.1.1 For carbon disulfide preparation, weigh 3 grams of the waste sample in a 1 5-ml glass vial. Add 3 grams of carbon disulfide to the vial and vortex the mixture vigorously. After allowing the solids to settle, inject the CS_2 extract into the GC.

10.1.1.2 For M-Pyrol preparation, weigh 1.0 grams of the waste sample in a 15-ml glass vial. Add 4.0 grams of M-Pyrol to the vial and vortex the mixture vigorously. After allowing the solids to settle, inject the M-Pyrol extract into the GC.

10.2 Recommended GC Operating Conditions

10.2.5 Additional Columns and Conditions

10.2.5.1 For capillary DB-1701 with FID

Column flow rate	1.0-1.5 ml/min
Make-up gas flow rate	30-50 ml/min
Split flow	60 cc/min
Injector Temp	250°C
Detector Temp	250°C
Air flow for FID	Approx.300 ml/min
Hydrogen flow for FID	Approx. 30 ml/min
Initial oven temp	35°C
Initial Time	6.0 min
Level 1 rate	6.0°C/min
Level 1 Final Value	180°C
Level 2 Rate	10°C/min
Level 2 Final Value	230°C
Run Time	40 min
Threshold	4 units
Peak Width	0.04 min

10.2.5.2 For capillary DB-624 with FID

Column flow rate	3.5 ml/min
Make-up gas flow	29mL/min
Air flow for FID	Approx. 300 ml/min
Hydrogen flow for FID	Approx. 30 ml/min
Injector temp.	275°C
Detector temp.	275°C
Initial oven temp.	35°C
Initial time	5 min
Level I rate	5°C/min
Level 1 final value	150°C
Level 1 hold time	4 min
Level 2 rate	20°C/min
Level 2 final value	225°C
Run Time	45 min

10.2.5.3 For packed SP-1000 with FID

Column flow rate	40mL/min
Air pressure for FID	300kPa
H_2 pressure for FID	130kPa
Injector temperature	250°C
Detector temperature	250°C
Initial oven temp.	90°C
Initial time	6 min
Level 1 rate	3°C/min
Level 1 final value	120°C
Level 2 rate	5°C/min
Level 2 final value	180°C
Level 3	10°C/min
Level 3 final value	230°C
Run time	46 min

10.2.5.4 For packed SP-2100 with FID

Carrier Gas flow	30mL/min
Injector temp	250°C
Detector temp	300°C
Ar flow rate(FID)	Approx. 300 mL/min
H_2 flow rate(FID)	Approx.30 ml/min
Initial oven temp	45°C
Initial hold time	3 min
Level 1 rate	15°C/min
Level 1 final value	90°C
Level 2 rate	10°C/min
Level 2 final value	195°C
Run time	16.5 min

10.2.6 The column used, operating conditions and detector must be specified in a site specific practice (SSP).

10.3 Linear Range Determination - The linearity and linear range for each compound must be established on any GC system used for quantitation. This must be done when an instrument is first set up or after any major maintenance or alteration of the system configuration, e.g., detector or injection port replacement. To demonstrate linearity, standards are analyzed at 3 - 5 concentration levels and a response factor calculated for each compound at each concentration. If the % RSD of the response factors is less than 20% over the working range, linearity through the origin can be assumed, and the average calibration factor can be used for quantitation. Final quantitation for each compound must be done within the linear range of that compound.

10.4 Calibration (External Standard Procedure):

10.4.1 A single point initial calibration of all compounds must be performed on an annual basis. Inject 0.5 - 2 µL of the stock standards which were prepared as per sec. 8.1. Tabulate peak area against concentration and express response factors (RF) for each component. For ease of calculation, it is recommended that the response factors be expressed as area counts per % by weight.

Vickery Facility	Method No. VIC0789-3	Date 02/13/98
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Vickery Site Specific

Method for Screening of Sulfides

using

Gas Detector Tubes

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GAS DETECTOR TUBE METHOD FOR SULFIDE

1.0 SCOPE AND APPLICATION

1.1 This method is designed as a screening device to detect low level amounts of sulfide in a acidified atmosphere by the utilization of a gas detector tube as evolved hydrogen sulfide gas.

2.0 SUMMARY OF METHOD

2.1 A portion of the sample is acidified in an Erlenmeyer flask to release hydrogen sulfide gas. The gas is funneled through a gas detector tube creating a stain inside the tube in proportions to the concentration of sulfide gas in the vapor. A definite color change in the tube indicates the positive presence of sulfide.

3.0 TERMINOLOGY

3.1 Screening Method means a preliminary qualitative or semi-quantitative test developed from classical qualitative and quantitative techniques. The method is designed to efficiently give the user specific information about the waste which will aid in determining waste identification, process compatibility and safety in handling.

4.0 SAMPLE STORAGE AND PRESERVATION

4.1 Samples should be analyzed as soon as possible. All liquid sample should be preserved with 2.5N sodium hydroxide to adjust the pH range between 10 to 13, if pH is less than 10 and samples are to be stored.

5.0 APPARATUS

5.1 A 500 milliliter ground glass stoppered Erlenmeyer flask.

5.2 A gas detector pump.

5.3 An automatic dispensing pipetor.

5.4 A 100 milliliter graduated cylinder.

5.5 pH meter.

6.0 REAGENTS

6.1 Gas detector tube with hydrogen sulfide indicator.

6.2 Concentrated hydrochloric or sulfuric acid, or acidic waste.

6.3 pH paper

7.0 PROCEDURE

7.1 Use between 1 and 100 ml of sample. Volume can be measured by using a graduated cylinder and/or an automatic dispensing pipetor.

7.2 Acidify this sample test portion to a pH of 2 or less with concentrated hydrochloric, sulfuric or waste acid. If waste is to be used, place the waste acid in the flask and add the sample test portion to a total volume of 100 ml. Gas vapor should now form.

7.3 Break both of the glass tip ends of the gas detector tube. Insert the tube into the gas detector pump. (Arrow towards pump)

7.4 Place the gas detector tube inside the mouth of the 500 milliliter Erlenmeyer flask. The end of the tube should reach halfway inside the flask. Actuate the pump the number of times directed in the manufacturers instructions and read the measurement of concentration by total length of discoloration.

7.5 If the detector tube reading is above the scale of the tube, alter the amount of sample used and/or the detector tube with an appropriate scale. This will reduce the amount of sulfide released and will allow the vapor concentration to be on the scale of the detector tube.

8.0 CONCENTRATION CALCULATION

8.1 In order to screen the concentration of releasable sulfide in the liquid sample, the

concentration of the gas must be converted to a concentration in liquid. This can be done by using the following calculation.

$$1 \text{ ppm } H_2S \text{ in gas} = 1.42 \text{ mg } H_2S/m^3 \text{ in gas}$$

X = ml of liquid sample
Y = ml vapor space in Erlenmeyer flask
Z = ppm H_2S reading on tube

To determine the mass (mg) of H_2S released from the liquid into the gas:

$$Z \text{ ppm } H_2S \times \frac{1.42 \text{ mg} H_2S/m^3}{\text{ppm } H^2S} \times Y \text{ ml} \times \frac{1 \text{ cm}^3}{\text{ml}} \times \frac{1 \text{ m}^3}{(100 \text{ cm})^3} = 1.42 \times 10^{-6} YZ \text{mg } H_2S$$

To determine the concentration of H_2S in the liquid sample:

$$1.42 \times 10^{-6} \text{ mg } H_2S \times \frac{1}{X \text{ ml}} \times \frac{1000 \text{ ml}}{1 \text{ L}} = \frac{1.42 \times 10^{-3} YZ \text{ mg}}{X \text{ L}}$$

Example: If you use 5 ml of liquid sample and acidify it into 95 ml of waste from T-1 or T-2, the Erlenmeyer flask has a vapor volume of 500 ml and you obtain a reading on the tube of 100 ppm, the total releasable sulfide is calculated as:

$$\frac{1.42 \times 10^{-3} YZ \text{mg}}{X \text{ L}} = \frac{1.42 \times 10^{-3} \times 500 \times 100}{5} = 14.2 \text{ mg/l}$$

9.0 REMARKS

9.1 The gas detector tube can only be used once and must be disposed of after a negative or positive result. After a positive result, the discoloration may persist for a short period of time, so that evaluation should be carried out immediately after the measurement.

9.2 Test the gas detector pump by inserting a gas detector tube with glass tip ends still intact. Actuate the pump once and the pump should maintain vacuum tightness.

9.3 All testing should be done in the fume hood.

10.0 QUALITY CONTROL

10.1 A quality control check sample is performed on each lot of sample tubes.

10.2 Duplicates and spikes will be performed on every 20th sample analyzed.

10.3 Since this is a semi-quantitative screening method, if the calculated concentration is 250 mg/l or larger, the sample should be analyzed by another, quantitative method. This is ½ the concentration of our site limit of 500 mg/l reactive (releasable) sulfide.

Vickery Site Specific Procedure

of

5W846, Method 3510C

Separatory Funnel Liquid-Liquid Extraction

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2.0 SUMMARY OF METHOD

2.1 A measured volume of sample, usually 100 ml, at the pH that the sample is received, is serially extracted with Methylene Chloride using a separatory funnel. It is extremely difficult to adjust the high pH and low pH samples due to the nature of the matrices involved.

4.0. APPARATUS AND MATERIALS

4.1 Separatory funnel - 0.5-2 liter, with polytetrafluoroethylene (PTFE) stopcock.

7.0 PROCEDURE

7.1 Using a 100 ml graduated cylinder, measure 100 ml(nominal) of sample. Quantitatively transfer the sample to a separatory funnel.

7.2 Measure a minimum of 100 microliter of the 25 ppm surrogate spiking solution into the sample and mix well. (See Method 3500B and the determinative method to be used for details on the surrogate standard solution and matrix spiking solution).

7.2.1 For the sample in each batch (see Chapter One) selected for use as a matrix spike sample, add an appropriate amount of the matrix spiking standard.

7.3 It is extremely difficult to adjust the high pH and low pH samples due to the nature of the matrices involved.

7.4 Use 20 ml of methylene chloride to rinse the cylinder and transfer this rinse solvent to the separatory funnel.

7.6 Allow the organic layer to separate from the sample phase. If the emulsion interface between layers is more than one-third the size of the solvent layer, the analyst must employ mechanical techniques to complete the phase separation. The optimum technique depends upon the sample and may include stirring, filtration of the emulsion through

glass wool, centrifugation or physical methods. Collect the solvent extract in a K-D Flask after filtering through Sodium Sulfate. If the emulsion cannot be broken (recovery <80% of the methylene chloride, corrected for the water solubility of methylene chloride), transfer the sample, solvent, and emulsion into the extraction chamber of a continuous extractor and proceed as described in Method 3520, Continuous Liquid-Liquid Extraction.

7.8 Serially extract three times with 20 ml of methylene chloride as outlined in Sec. 7.2-Sec. 7.5. Collect and combine the extracts and label the combined extract appropriately.

7.11 K-D Technique

7.11.4 Attach a three-ball Snyder column. Place the K-D apparatus on a hot water bath so that the concentrator tube is partially immersed in the hot water and the entire lower rounded surface of the flask is bathed with hot vapor. At the proper rate of distillation the balls of the column will actively chatter, but the chambers will not flood. When the apparent volume of liquid reached 1 ml, remove the K-D apparatus from the water bath and allow it to drain and cool.

Vickery Facility	Method No. SSP-3660B	Date 04/06/98
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Vickery Site Specific Procedure

to

SW846 Method 3660B

Sulfur Cleanup

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2.0 SUMMARY OF METHOD

2.1 The sample to undergo cleanup is mixed with either Copper, Mercury, or Tetrabutylammonuim (TBA) sulfite. The mixture is shaken and the extract is removed from the sulfur cleanup reagent.

5.0 REAGENTS

5.7 Mercury, triple distilled.

7.0 PROCEDURE

7.3 Removal of sulfur using mercury
NOTE: Mercury is a highly toxic metal. All operations involving mercury should be performed in a hood. Prior to using mercury, it is recommended that the analyst become acquainted with proper handling and cleanup techniques associated with this metal.

7.3.1 Concentrate the sample extract to below 10 ml and adjust to a final volume to 10 ml or higher depending on the desired dilution. Perform concentration using the K-D technique (Method 3510C, Sections 7.11.1 through 7.11.6).
CAUTION: When the volume of solvent is reduced below 1 ml, semi-volatile analytes may be lost.

7.3.2 Piped approximately 5.0 ml of the extract into a clean concentrator tube or Teflon-sealed vial.

7.3.3 Add one to three drops of mercury to the vial and seal. Agitate the contents of the vial for 15-30 sec. Prolonged shaking (2 hrs) may be required. If so, use a mechanical shaker.

7.3.4 Separate the sample from the mercury by drawing off the extract with a disposable piped and transfer to a clean vial.

7.4 Analyze the cleaned up extracts by gas chromatography (see determinative methods, Sec. 4.3. of this chapter).

Vickery Site Specific Procedure

to

SW846, Method 3665A

Sulfuric Acid/Permanganate Cleanup

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5.0 REAGENTS

5.3 Concentrated Sulfuric Acid (H_2SO_4).

7.0 PROCEDURE

7.1 Sulfuric acid cleanup

7.1.1 Piped approximately 5.0 ml of the hexane extract to a vial and, in a fume hood, carefully add approximately 2.0 ml of concentrated sulfuric acid.

7 1.11 Remove any remaining Sulfuric Add from the hexane extract with a Florisil wash before injecting.

7.2 Permanganate cleanup

7.2.1 Add approximately 1-2 ml of the 5 percent aqueous potassium permanganate solution to the combined hexane from 7.1.11.

7.3 Final Preparation

7.3.2 Remove any remaining Permanganate with a Silica Gel wash before injecting.

APPENDIX WAP-B

FIGURES

FIGURE 2-1
SAMPLING METHODS AND EQUIPMENT

MATERIAL	METHOD*	EQUIPMENT
Extremely viscous liquid	ASTM D140 ASTM E300	Tubing, trier or coliwasa
Crushed or powdered material	ASTM D346 ASTM E300	Tubing, trier, scoop, or shovel
Soil or rock-like material	ASTM D420 ASTM E300	Tubing, trier, auger, scoop, or shovel
Soil-like material	ASTM D1452 ASTM E300	Tubing, trier, auger, scoop, or shovel
Fly ash-like material	ASTM D2234 ASTM E300	Tubing, trier, auger, scoop, or shovel
Containerized liquids	SW-846 ASTM E300	Coliwasa or tubing
Liquids in impoundments	SW-846	Bomb sampler, tubing, weighted bottle, and/or dipper sampler

*ASTM refers to *Annual Book of ASTM Standards*, American Society for Testing Materials, Philadelphia, PA, 1994 or most recent edition. SW-846 refers to *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, SW-846, Third Edition, U.S. Environmental Protection Agency, Office of Solid Waste, Washington, DC, September 1986, as amended by Final Update I, July 1992, and Updates II and IIA, September 1994, or more recent edition or update.

FIGURE 3-1

USE OF MANDATORY ANALYSES

Test	Identification	
	Pre-Acceptance	Incoming
Physical Description	+	+
pH Screen	+	+
Specific Gravity	+	+
Liquid Waste Compatibility Test	+	+
Flammability Potential Screen	+	+
Cyanides Screen *	+	+
Sulfides Screen *	+	+
(VOC) Solvent Screen *	+	+
PCBs **	+	+
Radioactivity Screen	+	+

+ Test must be addressed.

* As required by Section (3.1).

** As required by section (3.1.1).

FIGURE 3-2

USE OF SUPPLEMENTAL ANALYSES

Test	(Identification) Acceptance	(Identification) Incoming	(Process Applicability) Storage	(Process Applicability) Filtration	(Deepwell) Disposal
Timed Filtration	+	+		*	*
Process Blend Testing	+	+	*	*	*
pH Spectrum	+	+		*	*
Solvent Screen	+	+		*	*
Process Testing or e Testing	+	+		*	*

\+ At the discretion of the Vickery General and/or Laboratory Managers.

* Test provides waste information which may be useful for these processes as described in Section 6.0.

FIGURE 3-2 (CONTINUED)
USE OF SUPPLEMENTAL ANALYSES

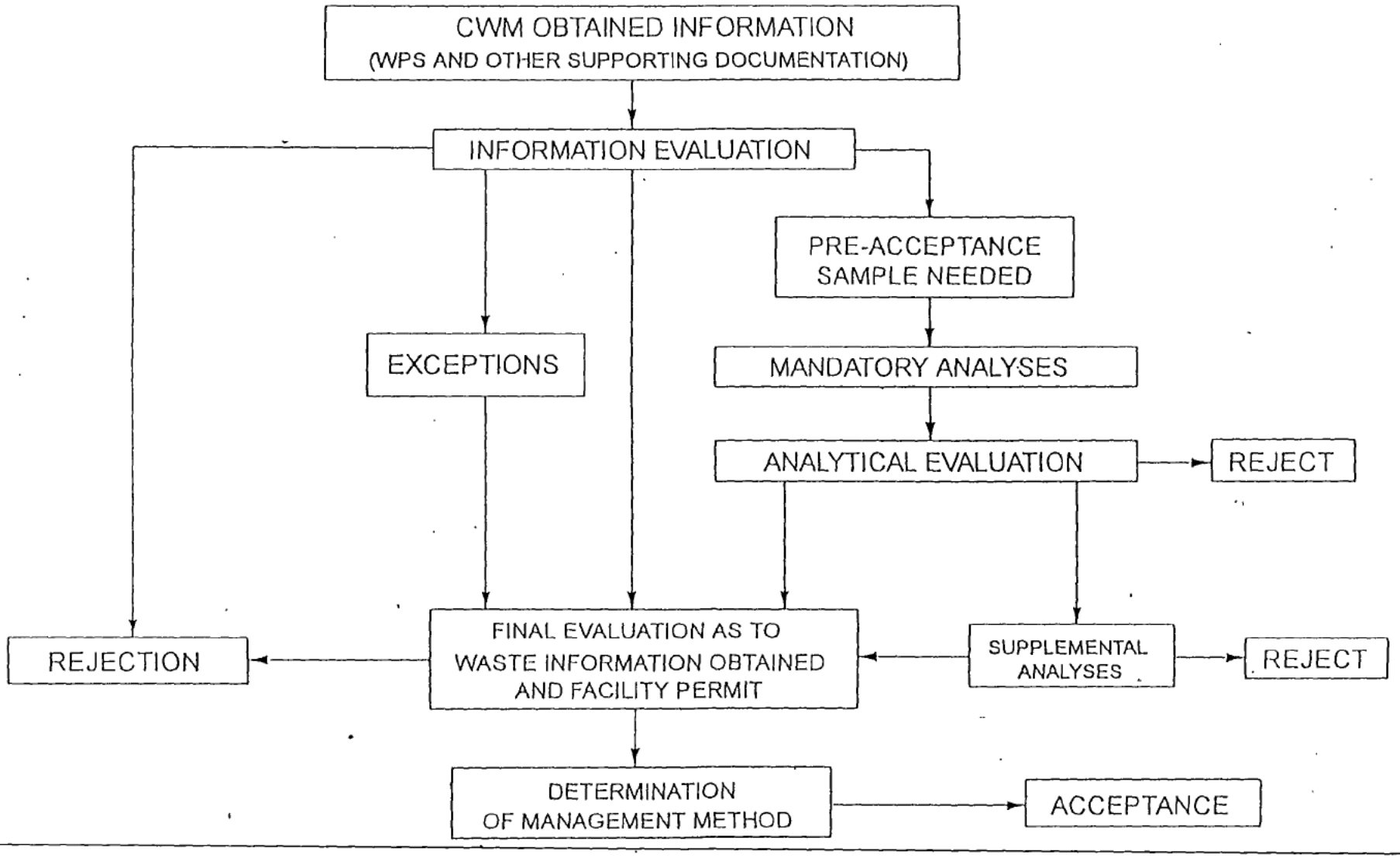
Test	Pre-Acceptance	Incoming	Storage	Filtration	Disposal
Heavy Metals	+	+		*	*
Miscellaneous Metals	+	+		*	*
pH	+	+	*	*	*
Sulfates	+	+		*	*
Specific Conductance	+	+	*		*
Chlorides	+	+		*	*
Nitrates	+	+			*
Fluorides	+	+	*		
Amenable Cyanides	+	+	*		*
Total Cyanide	+	+	*		*
Total Sulfide	+	+	*	*	*
Total Phenolics	+	+			*
Total Solids	+	+		*	*
TCLP	+	+	*		*
Suspended Solids	+	+		*	*
GC Scan	+	+			*
Flashpoint	+	+	*		
Viscosity	+	+		*	
Acidity	+	+	*		
Alkalinity	+	+	*		
Oil & Grease					*
Total Organic Carbon	+	+	*		*
Dissolved Solids	+	+		*	*

\+ At the direction of the Vickery General and/or Laboratory Managers.

* Test provides waste information which may be useful for these processes as described in Section 6.0.

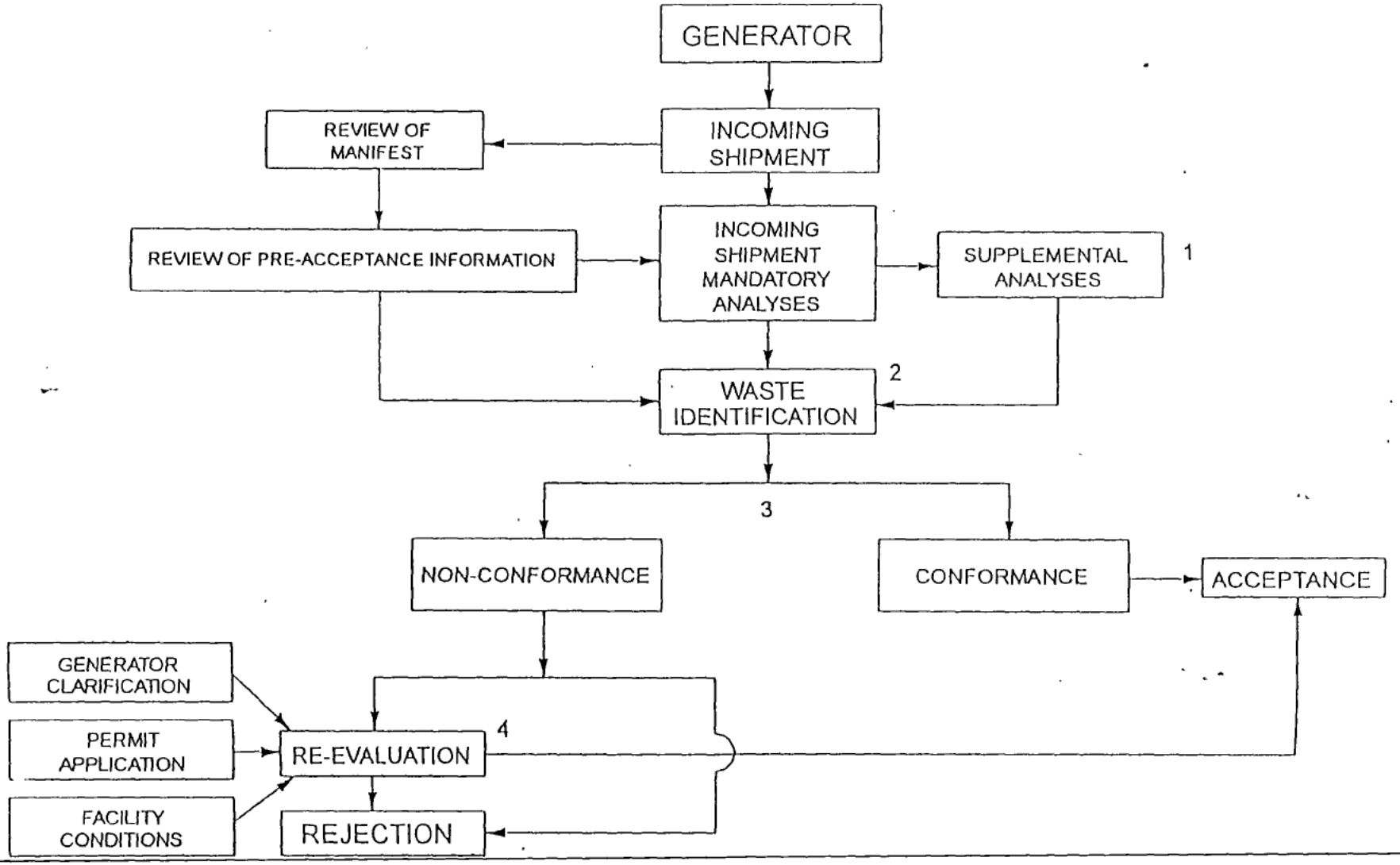
FIGURE 4-1

OVERVIEW OF THE PRE-ACCEPTANCE PROCESS



VIC 12/95

FIGURE 5-1
OVERVIEW OF THE INCOMING WASTE SHIPMENT IDENTIFICATION PROCESS



VIC 12/95

FIGURE 6-1

STORAGE

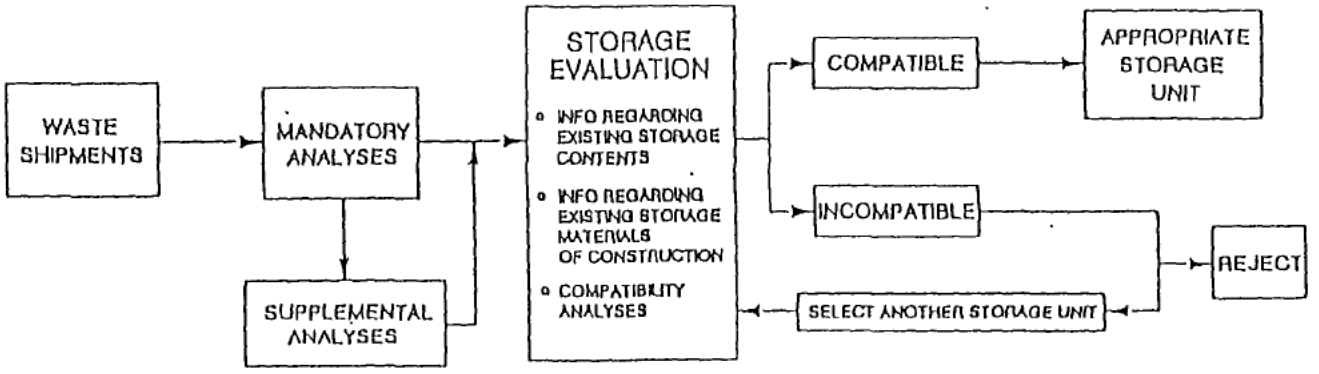
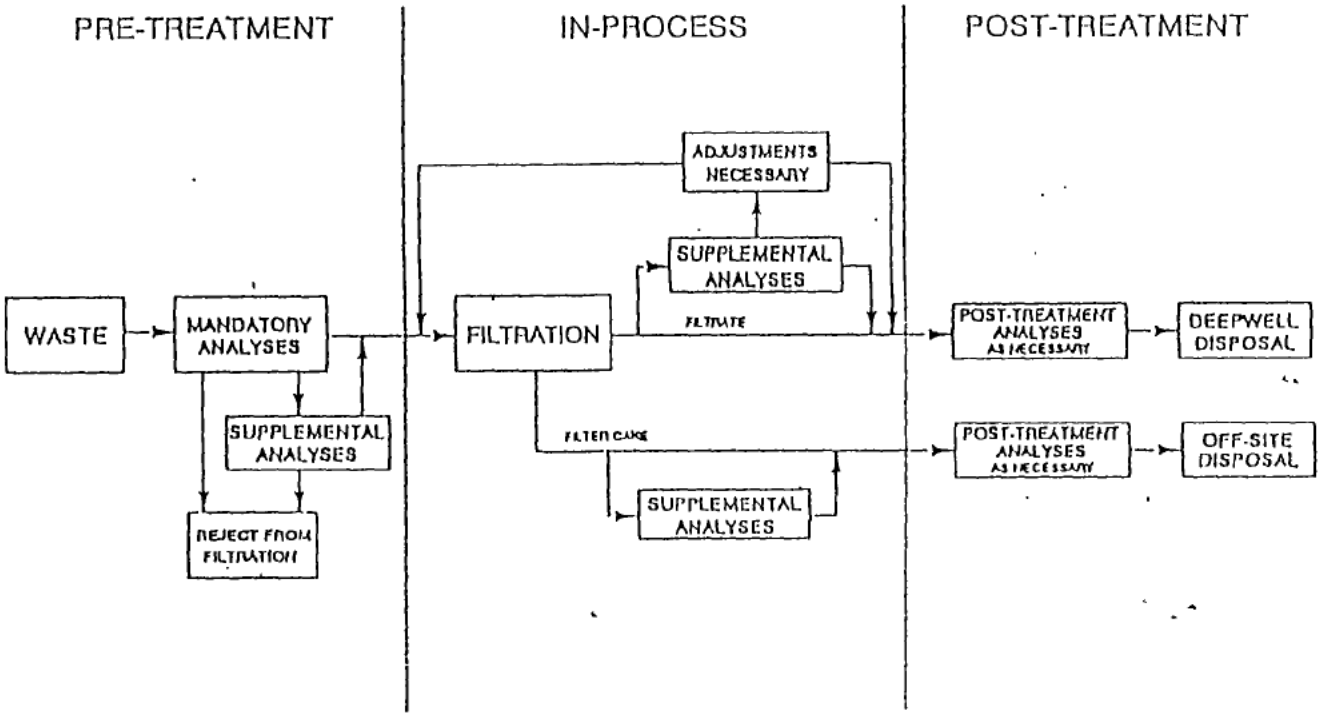


FIGURE 6-2

FILTRATION



APPENDIX WAP-C

FACILITY WASTE ACCEPTANCE CONDITIONS

The following are the current acceptance limitations for wastes at the Vickery Facility for deepwell injection:

1. Limited to 5% or less by volume oil, using standard BS&W test and corrected for tank shape if necessary. (Centrifuge Tube Acceptable)
2. Limited to less than 25 ppm detectable PCBs.
3. Closed cup flash point must exceed 140 °F.
4. Must be a pumpable liquid or semi-solid, not a paste or solid. (It may contain solids.)
5. Reactive cyanide (as Releasable) must be less than 250 ppm.
6. Reactive sulfide (as Releasable) must be less than 500 ppm.
7. VOC (Solvent Screen) must not exceed 5% by weight.
8. Waste must be compatible with existing materials of construction of the surface facilities and the injection wells.
9. Acceptable injectability must be indicated from previous Vickery experience or from supplementary analytical results.
10. Radiation level must not exceed background.

This list will be revised when applicable to meet changing regulations.

APPENDIX WAP-D

DESCRIPTION OF SAMPLING EQUIPMENT

COMPOSITE LIQUID WASTE SAMPLER

(Coliwasa)

Description

The Coliwasa is a device used to sample free-flowing liquids and slurries contained in drums, shallow open-top tanks, pits, and similar containers. It is especially useful for sampling wastes that consist of several immiscible liquid phases. It consists of a glass, plastic, or metal tube equipped with an end closure which can be opened and closed while the tube is submerged in the material to be sampled. The Coliwasa is available commercially or can be fabricated to conform to desired specifications.

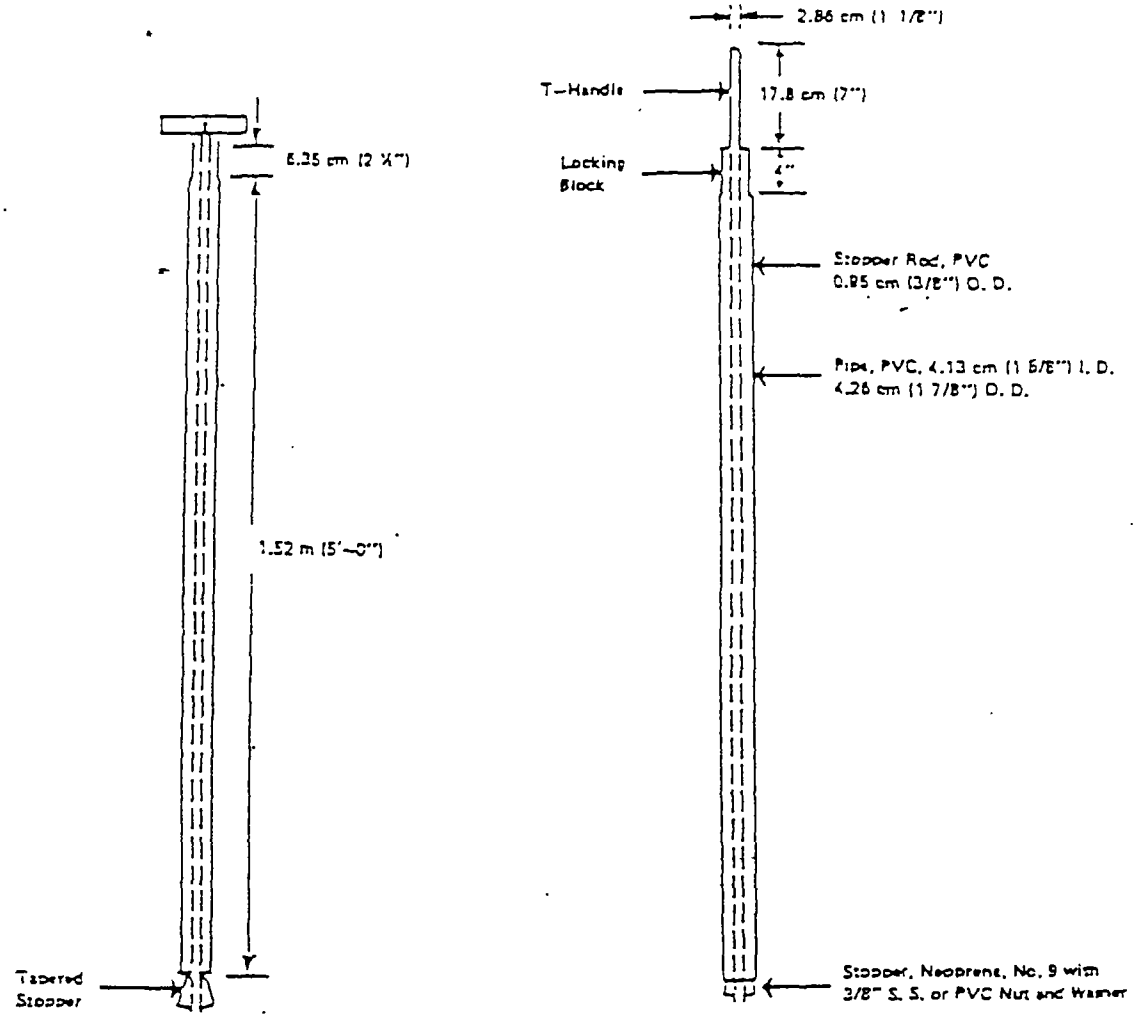
Procedures for Use (or see ASTM D5495):

1. Clean Coliwasa.
2. Adjust sampler's locking mechanism to ensure that the stopper provides tight closure. Open sampler by placing stopper rod handle in the T-position and pushing the rod down until the handle sits against the sampler's locking block.
3. Slowly lower the sampler into the waste at a rate that permits the level of liquid inside and outside the sampler to remain the same.
4. When the sampler hits the bottom of the waste container, push the sampler tube down to close and lock the stopper by turning the T-handle until it is upright and one end rests on the locking block.
5. Withdraw Coliwasa from waste and wipe the outside with a disposable cloth or rag.

General Comments and Precautions:

1. Do not use a plastic Coliwasa, unless it is constructed of fluorocarbons (e.g., Teflon), to sample wastes containing organic materials.
2. Do not use a glass Coliwasa to sample liquids that contain hydrofluoric acid.
3. If significant amounts of solid materials are present within 2 inches of the bottom of the container to be sampled, special procedures may be necessary to obtain a representative sample of this solid phase.

COLIWASA SAMPLER



SAMPLING POSITION

CLOSE POSITION

EPA METHOD FOR THE USE OF THE OPEN TUBE TUBING SAMPLER[1]

Description:

The open glass tube is the most versatile of hazardous liquid samplers because of its wide range of application, relatively low cost, and ease of operation. It is a hollow glass or plastic tube, usually 4 feet long, with an internal diameter of 0.25 to 0.50 inch, depending on the viscosity of the sample. Open tubes made specifically for sampling (i.e., drum samplers) can be purchased. The only difference between these and laboratory glass tubes is that the former have a constricted orifice at the top in order to facilitate plugging the opening to maintain a vacuum in the tube.

Procedure for Use:

Slowly lower the tube into the liquid to the desired depth. It may be desirable not to mix the contents of the containers so that a more representative sample can be collected.

When the sampler is inserted to the desired depth, stopper the tube with a rubber stopper, thumb, or by creasing a piece of flexible tubing attached to the open end of the sample tube. This is done to establish a vacuum in the tube, thereby enabling withdrawal of the sample from the container.

Slowly withdraw the tube from the vessel and expel the sample into the sample container. Avoid handling the portion of the sampler that was placed into the liquid. The tube can be disposed by placing it back into the container that was sampled.

---

[1] Personal Protection and Safety Training Manual (Cincinnati, Ohio: U.S. Environmental Protection Agency, National, Training and Operational Technology Center, 1981), pp. 3-1 and 3-4.

THIEF SAMPLER

Description:

A thief sampler consists of two slotted concentric tubes, usually constructed of stainless steel or brass. The outer tube has a conical pointed tip which permits the sampler to penetrate the material being sampled. The inner tube is rotated to pen and close the sampler. A thief is used to sample dry granules or powdered wastes whose particle diameter is less than one-third the width of the slots.

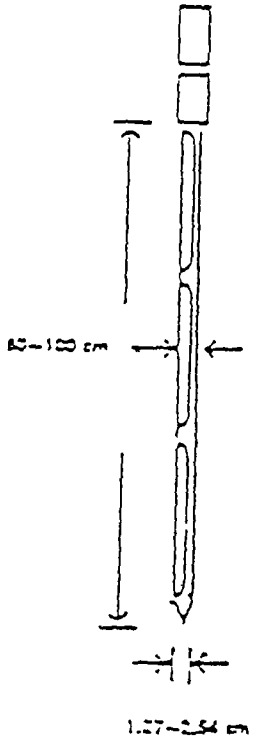
Procedures for Use:

1. Clean sampler.
2. Insert closed thief into waste material. Rotate inner tube to open thief. Wiggle the unit to encourage material to flow into thief. Close thief and withdraw. Place sampler thief in a horizontal position with the slots facing upward. Remove inner tube from thief and transfer sample to a container.

Comments and Precautions:

1. Before sampling, ensure that the waste will not corrode the thief.
2. If necessary, the thief may be painted with a 2-part epoxy or other chemical resistant paint when the thief must be used on a corrosive waste.

Ref: Footnote 1 on page A-13, section 1.2.1.4 and 3 on page A-14, Method E300.



Thief Sampler

WEIGHTED BOTTLE SAMPLER/BOMB SAMPLER

Description:

The weighted bottle consists of a glass or plastic bottle, sinker, stopper, and a line which is used to lower, raise, and open the bottle. Bomb samplers can be obtained through a commercial source. The weighted bottle samples liquid and free-flowing slurries.

Procedures for Use:

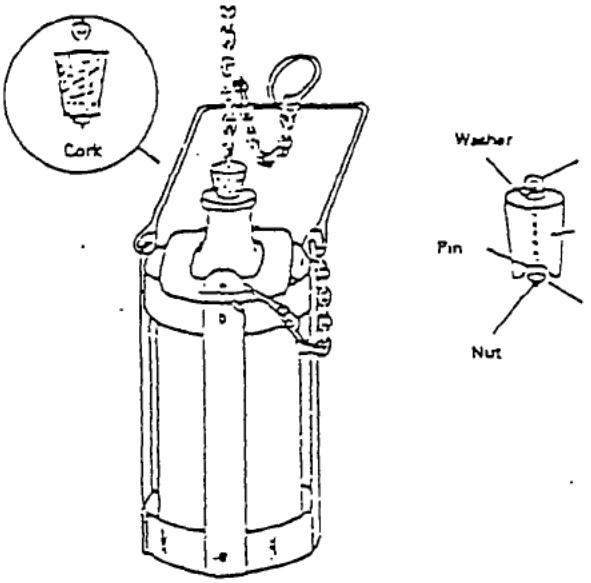
1. Clean bottle/sampler.
2. Assemble weighted bottle sampler/bomb sampler.
3. Lower the sampler to desired depth and pull out the bottle stopper or open bomb by jerking the line.
4. Allow bottle/sampler to fill completely as evidenced by cessation of air bubbles. Close bomb prior to raising.
5. Raise bomb/sampler, cap bottle, and wipe off with a disposable cloth. The bottle can serve as a sample container. Transfer bomb contents to an appropriate container.

General Comments and Precautions:

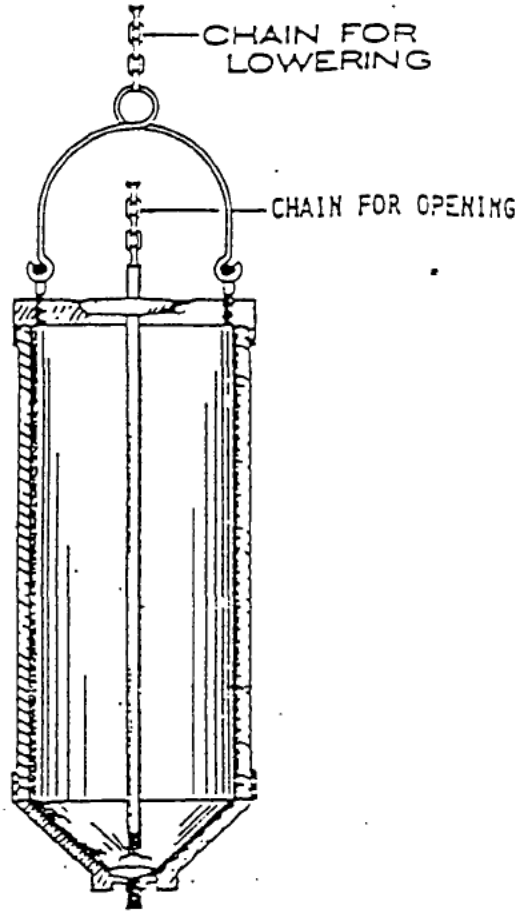
1. Do not use a nonfluorocarbon plastic bottle to sample wastes containing organic materials.
2. Do not use a glass bottle to sample wastes that contain hydrofluoric acid.
3. Before sampling, ensure that the waste will not corrode the sinker, bottle holder, or line.

Ref: Footnote 1 on page A-13, section 1.2.1.2 and 3 on page A-14, Method 1300.

WEIGHTED BOTTLE SAMPLER



TYPICAL BOMB SAMPLER



TRIER

Scope and Application

A trier consists of a tube cut in half lengthwise with a sharpened tip that allows the sampler to cut into sticky solids and loosen soil. A trier samples moist or sticky solids with a particle diameter less than one-half the diameter of the trier.

Apparatus:

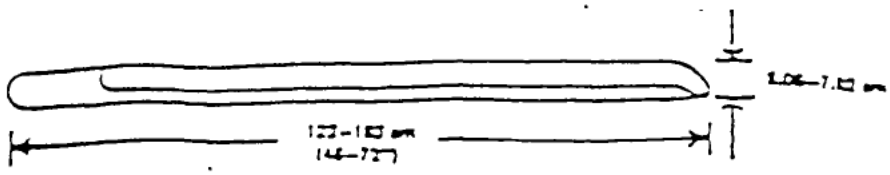
1. Triers 61 to 100 cm long and 1.27 to 2.54 cm in diameter are available at laboratory supply stores.
2. A large trier can be fabricated to conform to the specifications in Figure 5. A metal or polyvinyl chloride pipe, 1.52 m (5 ft.) long x 3.2 cm (1.4 in.) I.D., with a 0.32 cm (0.14 in.) wall thickness, is needed. The pipe should be sawed lengthwise, about 60-40 split, to form a trough stretching from one end to 10 cm away from the other end. The edges of the slot and the tip of the pipe are sharpened to permit the sampler to cut into the waste material being sampled. The unsplit length of the pipe serves as the handle.

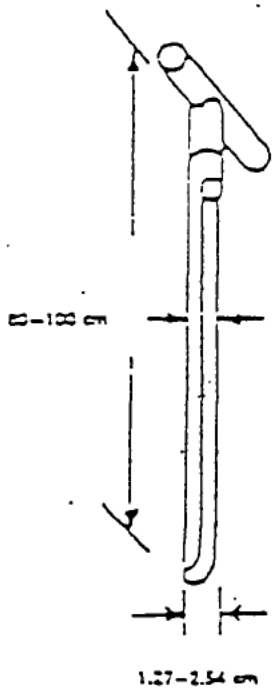
Procedure (or see ASTM D5491)

1. Clean trier
2. Insert trier into waste material 0 to 45° from horizontal. Rotate trier to cut a core of the waste. Remove trier with concave side up and transfer sample to container.

Ref: Footnote 1 on page A-13, Section 1.2.1.5.

SAMPLING TRIERS





AUGER

Scope and Application:

An auger consists of sharpened spiral blades attached to a hard metal central shaft. An auger samples hard or packed solids wastes or soil.

Procedure

1. Clean sampler.
2. Bore a hole through the middle of an aluminum pie pan large enough to allow the blade of the auger to pass through. The pan will be used to catch the sample brought to the surface by the auger.
3. Place pan against the sampling point. Auger through the hole in the pan until the desired sampling depth is reached. Back off the auger and transfer the sample in the pan and adhering to the auger to a container. Spoon out rest of the loosened sample with a sample trier.

Ref: Footnote 1 on page A-13, section 1.2.1.6 and 3 on page A-14, Method B300.

SCOOPS AND SHOVEL

Scope and Application:

Scoops are available at laboratory supply houses. Flatnosed shovels are available at hardware stores. Scoops and shovels are used to sample granular or powdered materials in bins, shallow containers and conveyor belts.

Procedures:

1. Clean sampler.
2. Obtain a full cross section of the waste material using a scoop or shovel that is large enough to contain the waste collected in one-cross section sweep.

Ref: Footnote 1 on page A-13, section 1.2.1.7 and 3 on page A-14, Method E300.

APPENDIX 2

INSPECTION PLAN

4/15/99

VICKERY FACILITY
INSPECTION
PLAN

3956 State Route 412
Vickery, Ohio 43464

584

INSPECTION PLAN

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INTRODUCTION

This Inspection Plan is designed to meet federal and state requirements for the inspection and prevention of system malfunctions, equipment deterioration and operator errors which, if allowed to continue could lead to either a release of hazardous waste to the environment or pose a threat to human health. The Inspection Plan is designed to provide for an early warning of such events so that corrective and preventive actions may be taken.

The Inspection Plan is divided into two segments: (1) general facility inspection, and (2) specific process unit inspections. The former focuses on items which apply to facility-wide operations, e.g., site security, safety, emergency equipment. The second category includes inspection of basic operations systems such as the laboratory, truck scale, truck washout facility, and storage units. Specific treatment process units and disposal systems including aqueous waste treatment and deepwell injection, are also included in this second category.

Inspections are performed according to a pre-determined schedule developed from engineering knowledge and operational experience with the systems and processes being inspected. The inspection criteria incorporate both the frequency and content of the inspection necessary to alert facility personnel prior to development of a serious problem. Through regular observation of the process and procedures, trained inspectors evaluate and assess each item, examining for potential malfunctions, equipment deterioration, and/or operator errors. The level of response and timing is determined by the nature and seriousness of the problem

identified by the inspector. If necessary, the departmental supervisor will assist the inspector in defining the response actions. In certain cases where processes or equipment are to be put on standby (i.e., not used) for extended periods, the frequency of inspections may be reduced during that period. However, a thorough reinspection will be performed before the unit is put back into regular service. The regular frequency of inspections will also be resumed at that time. In the event inclement weather makes it unsafe to perform daily inspections of certain elements, these elements will not be inspected and this will be noted on the inspection form. For other than daily inspections, the inspection shall be delayed to a day when weather conditions allow safe inspections. If conditions remain unsafe for the entire period, this will be noted on the inspection form.

1.0 INSPECTION PLAN ADMINISTRATION

The facility General Manager is fully responsible for the maintenance of the Inspection Plan. Departmental managers have been assigned specific areas of responsibility for the continued development and refinement of the program. The managers and their respective areas of responsibility are:

- Operations Manager	Deepwells, Truck Unloading/Wash and Waste Receiving Facility, Pretreatment, Tank Storage, Filtration, General Facility
- Laboratory Manager	Laboratory
- Health and Safety Manager	Safety, Security, Training of Inspectors,

The Inspection Plan is executed by qualified and trained individuals assigned the responsibility for detecting, adequately describing and correcting unsafe conditions so as to prevent adverse consequences. The designated individuals have the training and authority to:

- Perform the required inspections;
- Perform necessary evaluations and hazard assessments;
- Solicit other trained individuals as necessary to assist in the review and evaluation of potential hazards;
- Recommend appropriate corrective or remedial actions; and
- Ensure that the corrective actions have addressed the problem (by reinspection)

1.1 Personnel Qualifications

Each inspector is trained in the following fundamentals of hazardous waste management: hazard assessment, equipment and process inspections, recordkeeping, documentation requirements, and safety and contingency plan procedures. The qualifications, duties, and training of inspectors are detailed in the Facility Training Plan Personnel Job Descriptions.

1.2 Hazard Assessment and Evaluation Procedures

Inspectors are required to know and understand the location, functioning and maintenance of the equipment and systems they inspect. Should an inspection reveal an equipment malfunction, deterioration, or other improper condition, the inspector will:

- Evaluate the situation by considering the following points:

  (1) the location and nature of the problem;

  (2) the presence of secondary containment or control should an emergency occur;

  (3) the amount and type of waste material involved; and

  (4) the potential for human exposure.

- Determine the corrective measures needed to respond to the situation, including appropriate interim measures.

- Establish the time-frame for remedial response:

  Standard written reporting procedures are to be utilized to initiate the required corrective action for minor discrepancies.

  Imminent hazards require immediate verbal reporting to the Operations Manager (or appropriate supervisor on duty) with written follow-up when time permits or implementation of the Facility Contingency Plan.

- Provide adequate follow-up (reinspection) to ensure that the specified response has been completed to the satisfaction of the inspector and any other parties involved.

1.3 Documentation and Recordkeeping

Inspections and reinspections are conducted using forms specifically designed to contain all pertinent information. Separate Inspection Report Forms (Example Form 1) are provided for specified daily, weekly, or other scheduled inspection time periods. The Inspection Report Forms are prepared in advance to include the items or equipment to be inspected according to the specific inspection schedules. Periodic changes in conditions will be reflected in the actual inspection checklists. These changes

may result from temporary modifications to equipment use or location. If a permanent change in use or location has been made, the inspection checklists will be revised.

Each Inspection Report also includes significant administrative information, such as the identification of the facility unit, the name of the inspector, and the date and time of the inspection. The inspection checklist section of the form is used for indicating the operational status of the designated equipment or structures. If the designated equipment or unit is not in use, it is inspected according to the established time frame, and a notation of its operational status is made in the "status" column. The inspector's assessment is also marked on the Inspection Report. If the Inspector determines that an inspection element is unacceptable, he will indicate the unacceptable condition on the Inspection Report form (by notation or reference to a work order) even if the condition is immediately corrected. He will then correct the problem immediately or if the situation warrants more significant expertise or attention, issue a written request for corrective action. This written request is accomplished through the Upgrade Work Order & Reinspection Report (Example Form 2). This Form is used to initiate corrective action and document whether the noted discrepancies are resolved. Each discrepancy depicted on the Inspection Report Form is then referenced back to the prenumbered Upgrade Work Order & Reinspection Report. The completed Inspection Report Form is reviewed by the Department Supervisor.

In cases where the remedial action is beyond the authority or expertise of the Shift Supervisor, the facility's General Manager, Engineering Manager, or other outside expertise will be obtained

to resolve the noted discrepancy. If specialized contractors are required to perform testing or inspection services (e.g., annual tank certification), the results are recorded on the contractors' forms. These reports are made part of the inspection log once they are received.

Generally, corrective measures should be completed according to the time frame established by the inspector and Department Supervisor. However, in specific cases where urgent or emergency action is required, coordination with cognizant facility personnel may require more frequent monitoring of the situation until the required response can be completed.

In cases where physical and/or operational constraints (e.g., replacement equipment availability) require longer time frames to complete the response, interim solutions may be required to protect the integrity or safety of the system. If necessary, new Inspection Forms for these interim operating devices will be established and will become part of the inspection record.

As an additional measure, reinspections are performed to ensure that the corrective action taken meets the approval of both the inspector and the designated supervisor. The reinspection report, the original Inspection Reports and the Upgrade Work Order & Reinspection Report are all returned to the Operating File thus confirming the completion of the job task. These inspection records will, under normal circumstances, be maintained for a minimum of three (3) years from the date of the inspection.

1.4 Example Forms

The following forms are included for further reference:

Example Form	Name of Form	Purpose of Form
1	Inspection Report	Defines inspection Parameters and Results of Inspection
2	Upgrade Work Order & Reinspection Report	Written request for corrective action

Inspection Report Forms are prepared to incorporate both the inspection elements and the frequencies of inspection. Table 1.1 is a list of form numbers and the respective areas they cover. Sections 2 and 3 discuss the basis for the frequency and inspection parameters.

EXAMPLE FORM 1

VICKERY OHIO FACILITY

DAILY Inspection Report

Date & Time of Inspection: _____ _____Hr.

Inspection/Process Unit Name:

INSPECTION CHECKLIST

Inspection Element	Equipment, Structure Or Items To Be Inspected	Status			Corrective Action Taken
		Accept.	Unaccept.	Time	

Signature of Inspector(s)

Managerial Review

N/O - Non-Operational

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UPGRADE WORK ORDER & REINSPECTION REPORT

Date of Inspection _____ / _____ / _____

Name of Inspector _____

UPGRADE WORK ORDER

Equipment Item/Unit Name:

Location:

Inspection Issue:

Required Upgrade: _____

Work to be Completed by: _____ / _____ / _____

Corrective Action Assigned to: _____ / _____
Name Title

Managerial Signature: _____

WORK COMPLETION REPORT

Received on: _____ / _____ / _____ BY: _____

Completed on: _____ / _____ / _____ Comments: _____

By: _____
Print Name

REINSPECTION REPORT

Observations:

Comments

_____
Signature of Inspector

Date _____ / _____ / _____

White – Operational Record No. 2 Copy Green – Maintenance Copy Yellow – Operational Record No. 1 Copy

TABLE 1.1

INSPECTION FORMS AND SCHEDULE

FORM		AREA
	(Daily)	
1D		Lab
2D		Truck Scale Area
4D		IAWTS
8D-11D		Wells
12D		Truck Unloading
	(Weekly)	
3W		Emergency Response Equipment
5W		Lab
9W		Inject/Transfer Line Drain Pots
10W		Container Storage
	(Monthly)	
1M		Security
	(Annually)	
1A		Grit Filter Leak Test

2.0 GENERAL FACILITY INSPECTION

The general facility inspection activity encompasses the facility perimeter and those items within the property that are common (i.e., not process-specific) to all operations. The general facility inspection activities encompass the following:

- Security Devices; and
- Safety and Emergency Equipment.

The general inspection schedules including inspection parameters and frequency are determined by the types of problems that can potentially occur.

2.1 Types of Potential Problems

The following considerations are pertinent to identification of the types of problems that may occur which are related to general operations:

- Breach of security, unknowing or unauthorized entry by persons, livestock or natural (e.g., climatological) events. Such a breach may occur due to: (1) failure of the surveillance system, (2) damage to fences, natural barriers or entry control structures, or (3) obstruction, damage or loss of warning signs.
- Health and safety equipment failure, absence or inaccessibility.

2.2 General Inspection Schedules

The general inspection schedules are based on the facility's

operational mode, potential failure modes, and an assessment of the hazard magnitude posed by a particular malfunction, failure or discrepancy and Ohio regulations.

The inspection schedule for security devices (Table 2.1) was designed in accordance with Section 264.14 of 40 CFR and Section 3745-54-14 of the Ohio Administrative Code. The inspection schedule for safety and emergency equipment (Table 2.2) was designed in accordance with 40 CFR 264.15 and Section 3745-54-15 of the Ohio Administrative Code, using the above referenced inspection schedules.

TABLE 2.1

GENERAL INSPECTION SCHEDULE
SECURITY DEVICES

Equipment	Inspection Element/ Type of Problem	Inspection Frequency
Fence	Inspect entire perimeter for breaches, damage	Monthly
Gate	Check for proper gate lock function	Monthly
Warning Signs	Check for presence of warning signs	Monthly

TABLE 2.2

GENERAL INSPECTION SCHEDULE
SAFETY AND EMERGENCY EQUIPMENT

Equipment	Inspection Element/ Type of Problem	Inspection Frequency
Communications/ Alerting Systems	Check accessibility	Weekly
	Check for operation	
Fire Extinguishers	Check pressure gauge for full charge indication	Weekly
	Check inspection tag to ensure annual maintenance by outside service is up-to-date	
	Check seal to ensure no one has used extinguisher	
	Check to ensure access to units is not blocked	
Fire Blankets	Check for deterioration	Weekly
	Check for adequate supply	
	Check accessibility	
Absorbent Supply	Check for adequate supply	Weekly
Emergency Showers and Eyewashes	Check that units activate and shut off properly	Weekly
	Check accessibility	

TABLE 2.2

GENERAL INSPECTION SCHEDULE
SAFETY AND EMERGENCY EQUIPMENT
(Continued)

Equipment	Inspection Element/ Type of Problem	Inspection Frequency
First Aid Boxes	Check accessibility Check for damage Check for adequate supply	Weekly or Monthly
Emergency Response Box	Check for accessibility Check for adequate supply Check for proper operation	Weekly
Personnel Protective Gear	Check accessibility Check for adequate supply Check for deterioration, damage	Weekly
Respiratory Protective Equipment (SCBA)	Check for accessibility Check for adequate supply, full charge on canisters, and all air tanks Check for deterioration, damage Check for operability Check for proper storage, cleanliness	Weekly

3.0 PROCESS-SPECIFIC INSPECTION ACTIVITIES SCHEDULES

3.1 Laboratory Inspection

A principal source of concern in the facility's chemical laboratories is the potential for an inadvertent spill or release of hazardous waste constituents due to the improper handling, storage or disposal of samples. Failure of ventilation or hood systems, improper placement or storage of samples, and general housekeeping are also inspection concerns. The laboratory is inspected each day it is in operation.

The pertinent inspection parameters and frequency of inspection for the on-site laboratory (Table 3.1) were designed in accordance with Sections 264.15 and 264.17 of 40 CFR and Sections 3745-54-15 and 3745-54-17 of the Ohio Administrative Code. Inspection Report Forms 1D and 5W are used in inspecting the facility's laboratories.

3.2 Truck Scale and Sampling Station

The major concern at the truck scale and sampling station areas is the clean-up of spills which may occur at these locations during weigh in, inspection or sampling of incoming waste deliveries. The areas are inspected daily to verify the proper clean-up and removal of spilled materials, used absorbent material and sampling residues.

The pertinent inspection parameters and frequency of inspection for the Truck Scale and Sampling Station (Table 3.2) were designed in accordance with Section 264.14 of 40 CFR and Section 3745-54-15 of the Ohio Administrative Code. Inspection

Report Forms 2D and 12D are used in inspecting the truck scale and sampling station areas.

3.3 Tank and Filter Inspection

The types of potential problems which can occur at or near waste storage/ treatment tanks or filters are:

- Structural failure of tanks or secondary containment;
- Operating equipment (i.e., pumps, valves) failure or malfunction;
- Level-monitoring equipment failure; and
- Spills during loading and unloading.

The elements and frequency of inspection for the tanks, and filters were developed in accordance with Sections 264.174, 264.195 (a) and (b) of 40 CFR and Section 3745-55-74, and 3745-55-95 (A) and (B) of the Ohio Administrative Code. For each tank that does not have secondary containment meeting the requirements of 40 CFR 264.193 and OAC 3745-55-93, a tank system integrity assessment will be conducted annually. This is in accordance with 40 CFR 264.193(i)(2) and OAC 3745-55-93(I)(2). In accordance with 40 CFR 264.193(i)(3) and OAC 3745-55-93(I)(3), above ground piping without secondary containment, or which is not excepted from the requirements of secondary containment, is tested for leaks annually.

Inspection Report Forms 4D and 12D are used in inspecting the waste storage treatment tanks and filters.

3.4 Deepwell Inspection

The types of potential problems posed by the facility's injection deepwell operations are as follows:

- Structural failure or deterioration of surge tanks (filtered acid tank "FAT"), filter units, sump and containment structures at pump houses;
- Malfunction of operating equipment such as pumps, hoses, fittings, valves, seals, relief or vacuum vents; and
- Failure of process monitoring equipment, such as tank level gauges, temperature and pressure gauges, pH monitors, high level alarms.

The deepwell inspection elements and frequencies are shown in Table 3.4. Inspection Report Forms 8D through 11D and 9W are used in inspecting injection deepwell operations.

Note: In accordance with applicable regulations for deepwell operation, additional inspection elements are performed as part of other deepwell operating procedures.

3.5 Container Storage Inspection

The principal concerns associated with container storage of hazardous wastes at the site are failure of the containers. The elements of this inspection (Table 3.5) were developed in accordance with Section 264.170 of 40 CFR and OAC 3745-55-70. Inspection Report Form 10W is used in inspecting the facility's container storage.

3.6 Truck Unloading/Wash Facility Inspection

The types of potential problems which can occur at this facility are:

- Spills during unloading of trucks and transfer and loading of receiving tanks;
- Operating equipment (i.e., pumps, valves) failure or malfunction;
- Structural failure of tanks in containment area or miscellaneous units (thief pole rinsing system, grit filters and associated sand interceptor vaults); and
- Monitoring equipment failure or malfunction.
- Spills from sampling activities.

The elements of this inspection (Table 3.6) were developed in accordance with Section 264.15 of 40 CFR and OAC 3745-54-15. The annual leak test performed on the grit filters may be performed by site personnel and will be documented in the facility's operating record.

Inspection Report Form 12D is used in inspecting the truck unloading, sampling and wash facility.

TABLE 3.1

LABORATORY INSPECTION SCHEDULE

Equipment	Inspection Element/ Type of Problem	Inspection Frequency
Sample Disposal Systems	Observe if proper disposal procedures are in use (when in use)	Daily
Ventilation/ Hood Systems	Check operability (when in use)	Daily
Housekeeping	Check laboratory for open aisles, cleanliness and orderly appearance when in use	Daily
Chemical and Sample Storage	Check to see if lab samples and materials are stored in a safe and organized manner	Weekly

TABLE 3.2

TRUCK SCALE AND SAMPLING STATION INSPECTION SCHEDULE

Equipment	Inspection Element/ Type of Problem	Inspection Frequency
Truck Scale	Check for evidence of spilled material on or around scale	Daily
	Check for removal of spill clean-up materials	
	Check sump for operability	
Vehicle Sampling Area	Check for evidence of spills	Daily
	Observe if proper sampling procedures are in use	
Sampling Equipment	Check for proper storage	Daily

TABLE 3.3

TANK AND FILTER INSPECTION SCHEDULE

Equipment	Inspection Element/ Type of Problem	Inspection Frequency
Tanks Containment Area	Check for evidence of spilled materials	Daily
	Check for evidence of seepage outside containment (e.g., discoloration, dead vegetation)	
	Check for debris, clean-up residue, improperly stored equipment	
	Check for proper drainage of precipitation and timely removal of liquid accumulation	
Tanks	Inspect tank exterior for cracks, leaks, discoloration, and obvious deformation	Daily
	Check foundation monitoring pipes for indication of any leaks through tank floor plates	Monthly

TABLE 3.3

TANK AND FILTER INSPECTION SCHEDULE
(Continued)

Equipment	Inspection Element/ Type of Problem	Inspection Frequency
Fill/Drain and Overflow Piping	Inspect piping and joints for leaks	Daily
	Inspect valve seals for leaks	
	Check that handles are not bent or damaged	
	Inspect outflow line valves to assure they are locked or blind flanged when not in use	
Liquid Levels	Check if operators' log book is up-to-date	Daily
	Check tank liquid level indicators for operability	
	Check high level alarms	Daily
Pumps	Inspect pumps for proper operation and maintenance	Daily
Sump Collection	Check to see if spill material and/or precipitation is removed on a timely basis	Daily
Filters	Check lines and valves for leakage.	Daily
	Check filter system for leakage.	
	Check for good housekeeping.	

TABLE 3.4

DEEPWELL INSPECTION SCHEDULE

Equipment	Inspection Element/ Type of Problem	Inspection Frequency
Tank Containment	Check for evidence of spilled material	Daily
Area for FAT Tanks	Check for evidence of seepage outside containment (discoloration, dead vegetation, odor)	
	Check for debris, clean-up residue, improperly stored equipment	
FAT Tanks	Inspect tank exterior for cracks, leaks, discoloration, corrosion erosion, structural integrity	Daily
Fill/Drain and Overflow Piping (Intake and Injection Lines)	Inspect piping and joints for leaks	Daily
	Inspect valve seals for leaks	
	Check that handles are not bent or damaged	

TABLE 3.4

DEEPWELL INSPECTION SCHEDULE
(Continued)

Equipment	Inspection Element/ Type of Problem	Inspection Frequency
Operational Records Log Books	Check if operators log book is up-to-date	Daily
Monitoring Devices (Liquid Level Indicators, Pressure Gauges)	Check for operability	Daily
Filters	Check for structural deterioration, corrosion	Daily
	Check for proper disposal of filters	
Well Head and Operating Equipment	Check for leaks, deterioration due to corrosion, structural damage	Daily
Pumps limits	Inspect for proper operation	Daily
	Check for operation and maintenance	
[redacted] Drain Tanks	Check for liquid accumulation	Weekly
	Check for damages	

TABLE 3.4

DEEPWELL INSPECTION SCHEDULE
(Continued)

Equipment	Inspection Element/ Type of Problem	Inspection Frequency
Leak Detection Pots (black)	Check for damages	Weekly
	Check line break alarms	
	Check for liquid accumulation in pots	

TABLE 3.5

CONTAINER INSPECTION SCHEDULE

Equipment	Inspection Element/ Type of Problem	Inspection Frequency
Hazardous Waste Containers	Check for hazardous waste labels	Weekly
	Check for leaks	Weekly
	Check for accumulation start date	Weekly
	Check that container closed	Weekly
	Check for signs of corrosion or deterioration	Weekly
	Check that containers are not standing in accumulated liquid	Weekly
Roll-off Boxes	Check to see if container is closed (tarped roll-off)	Weekly
	Check for evidence of leaks	Weekly
	Check for labels	
	Check for significant container deterioration or damage	Weekly
	Check that containers are not standing in accumulated liquid	Weekly

TABLE 3.6

TRUCK UNLOADING WASH FACILITY
WASTE RECEIVING SYSTEM

Equipment	Inspection Element/ Type of Problem	Inspection Frequency
Truck Unloading Area	Check for evidence of spills in unloading areas	Daily
	Check for removal of spill absorbent and clean-up material	
	Inspect hoses for deterioration or leakage	
	Inspect hose couplings and valves for leakage	
	Check for debris, improperly stored equipment	
Receiving Tank Containment Area	Check for evidence of spilled materials	Daily
	Check for proper drainage and removal of liquid accumulation	
	Check for debris, clean-up residue	
Tanks	Inspect tank exterior for cracks, leaks, discoloration, and obvious deformity	Daily
Fill/Drain and Overflow Piping	Inspect piping for leaks	Daily
	Inspect valve seals for leaks	
	Check that handles are not bent or damaged	
Grit Filters	Check high level alarm	Daily
	Check for evidence of corrosion	
	Check that drain lines/boots properly connected and in good condition	
	Assure splash guards are in place	

TABLE 3.6

TRUCK UNLOADING WASH FACILITY
WASTE RECEIVING SYSTEM
(Continued)

Equipment	Inspection Element/ Type of Problem	Inspection Frequency
	Assure filters not overflowing or leaking	
	Perform leak test of grit filters in use	Annually
Sand Interceptor Vaults	Check liquid level alarm system	Daily
	Check for standing water in vault	
	Assure drain pipe is not plugged	
Liquid Levels	Check high level alarms	Daily
	Check tank liquid level indicators for operability	
Pumps	Inspect pumps for proper operation and maintenance	Daily
Collection Tubs	Check for container integrity	
	Check lid is secure	
	Check for hazardous waste labeling on top and side of tub	
	Check that tub is emptied daily	
Vehicle Sampling Area	Check for evidence of spills	Daily
	Observe if proper sampling procedures are in use	
Sampling Equipment	Check for proper storage	Daily
Thief Pole Rinsing System	Check overflow control	Daily
	Check for evidence of corrosion	
	Check for leaks or damage to system integrity	

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8/17/01

VICKERY ENVIRONMENTAL, INC.

EMERGENCY RESPONSE PROCEDURES
AND
CONTINGENCY PLAN

3956 State Route 412
Vickery, Ohio 43464

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PREFACE

This document is the Emergency Response Procedure and Contingency Plan, herein after referred to as the Contingency Plan or Plan, that will be activated in the event of a release of hazardous waste or other emergency at the Vickery Facility which poses a threat to human health or the environment. Pursuant to the requirements of 40 CFR 264.51 and OAC 3745-54-51, the facility will maintain this Plan which details procedures to "minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous wastes or hazardous waste constituents to air, soil, or surface water." A current copy of this Plan will be kept at the facility.

This Plan provides a description of the response procedures to be implemented in an emergency situation which will protect the public, personnel at the facility, and the environment. Various structural and operational measures are in place which are designed to minimize the possibility of such an emergency occurring. The following sections present the procedures and details for implementation of the Plan.

This document\plan will be maintained and administered by the Site Safety Manager. In his absence, the responsibility for the maintenance and administration of this document\plan will be that of the Site Environmental Department.

Department Managers and Supervisory Personnel shall assist in the development and the administration of the emergency program within their areas of responsibility and training.

NOTIFICATION ACTION SUMMARY

ON-SITE NOTIFICATION:

Report all emergencies to the Emergency Coordinator.

Communication Systems

Two-Way Radios:

Base Station	Main Office Building
	Truck Wash/Unloading Building (Control Room)
Mobile Units	Maintenance Department Vehicle(s)
	Operations Vehicles
Portable Units (5)	

Telephones for external communication (419) 547-7791 and internal communication can be found at the following locations:

- Truck Wash/Unloading Building
- Administrative Office Building
- Receipt Control
- Maintenance Shop
- Guard House
- Pump Houses 1, 2, 3, and 5
- T-Tank Pump House
- Filter Buildings 1 and 2
- Lunchroom/Change Room
- Control Room
- Main Laboratory

An additional telephone is located in the Control Room. The number is (419)547-3561.

Emergency Coordinators (EC) and Communications Coordinators (CC) and Their Alternates

See the attached table for the names, telephone numbers and addresses of the Emergency Coordinators and Communications Coordinators.

8/17/01

INCIDENT TELEPHONE CONTACT LIST

EMERGENCY COORDINATORS

Shift Supervisor On Duty (Primary)

John Moneghan

[redacted]

Kennard Franks

[redacted]

Dennis McClure

[redacted]

Kevin L. Adams

[redacted]

Robert A. Baumer

[redacted]

Greg Burr

[redacted]

Dan Durbin

[redacted]

Vince Sidoti

[redacted]

EMERGENCY COORDINATORS

Steve Lonneman

[redacted]

Brian Franks

[redacted]

COMMUNICATIONS COORDINATOR (CC)

Steve Lonneman
(419) 797-6385

NOTE: If appropriate the EC will notify the General Manager as soon as possible following an incident.

NOTE: If the Emergency Coordinator leaves the site, he will take a cell phone, radio or a paging device so that the site may contact him in an emergency. The contact information will be given to the Control Room Operator.

External Reporting Requirements

The EC or his designee is required to notify the following agencies if a "reportable quantity" of hazardous waste has been released to the environment within the facility boundaries:

1. Ohio EPA Emergency Response..... (800) 282-9378
2. Ohio EPA Northwest District Office.... (419) 352-8461

The EC or his designee is required to notify the following agencies if a "reportable quantity" of hazardous waste has been released to the environment outside the facility boundaries:

1. National Response Center..... (800) 424-8802
2. Sandusky County Sheriff ..... (419) 332-2613 or 911
3. Sandusky County Emergency Planning Committee .....via Sheriff's Office
4. USEPA Region V Office..... (312) 353-2318

The following additional agency must be notified of any release of hazardous waste to an off-site waterway.

1. US Coast Guard..... (216) 937-0111

[1] The reportable quantity of hazardous waste for the site is one pound (which is equivalent to one (1) pint) to the environment unless otherwise specified by Section 311 of the Clean Water Act - or in Section 302.4 of CERCLA.

1.0 GENERAL FACILITY DESCRIPTION

The Vickery Facility is located on State Route 412, 2 miles west of Vickery, Ohio. It is permitted for the storage, treatment and disposal of liquid hazardous waste.

1.1 FACILITY IDENTIFICATION, LOCATION AND SITE PLAN

Name: Vickery Facility

Location: The facility is at the corner of State Route 412 and State Route 510.

Facility Parent Company:
Waste Management, Inc.
1001 Fannin, Suite 4000
Houston, TX 77002
(713)512-6200

Facility Owner, Operator and Mailing Address:
Vickery Environmental, Inc.
3956 State Route 412
Vickery, Ohio 43452
419-547-7791

Figure 1-1 provides a location and vicinity map for the facility. Figure 1-2 shows the layout of the existing facility.

1.2 FACILITY OPERATIONS

The treatment/storage tanks are used to handle wastes generated off-site and on-site. Wastes are blended, filtered and then disposed of by deepwell injection. Wastes are received and unloaded in the Truck Unloading Facility. After unloading, wastes are pumped to the storage/treatment tanks. After blending to the desired pH, the waste is pumped through a primary filter to remove solids. Filtered waste is then pumped through polishing filters and is finally pumped to a disposal well. Solids removed from the treated wastes are collected and shipped to permitted off-site disposal facilities. The facility is operated 24 hours a day, 7 days a week.

1.3 HAZARDOUS WASTES RECEIVED AT FACILITY

Section 11.1 details the types of wastes that typically are received and will be received at the facility.

1.4 TYPES OF POTENTIAL EMERGENCIES

The potential for an emergency may exist at this facility due to its operational activities and the type of materials it handles. Additionally, natural events ("Acts of God") could create an emergency situation at the facility that would have to be appropriately and effectively managed. These are addressed below as events which could potentially trigger implementation of the Contingency Plan.

1.4.1 Emergencies Inherent to Facility Operations

Potential emergencies which could result from facility operations and the types of materials processed for disposal include:

- Fire[1]
  - Could cause the release of toxic/caustic fumes.
  - Could spread and possibly ignite materials at other locations on site, or cause heat-induced explosions.
  - May produce contaminated run-off from fighting fire with water or chemical fire suppressant.
- Explosion
  - Could cause a safety hazard from flying fragments or shock waves.
  - Could ignite other hazardous waste at the facility.
  - Could result in release of toxic/caustic material.
- Spills or Material Releases
  - Could result in release of flammable liquids or vapors capable of causing a fire or gas explosion hazards.
  - Could cause the release of toxic/caustic liquids or fumes.
  - Could result in contamination of off-site surface water.
- Accident (vehicle or equipment)
  - Could cause a fire, explosion or spill, as described above.
  - Could result in mixing of incompatible chemicals.
  - Could cause surface contamination through release of toxic/caustic liquids.
  - Could cause air contamination through release of fumes.
- Injury\Illness
  - Could require the administration of first aid\CPR by site personnel or outside medical help.

1.4.2 Natural Events

There are potential facility emergencies which could result from "Acts of God", including major climatological, geophysical, or other natural events such as:

1.4.2.1 Heavy rainstorms, including lightning strikes and hail.

1. Policy

The policy of this facility is to act conservatively and to have all employees seek cover during a thunderstorm if there is a threat of a lightning strike to an employee or equipment. The shift supervisor's are responsible for protecting their employees from the threat of lightning strike. All supervisors have the authority to have their employees temporarily cease operations and seek cover inside if local atmospheric conditions are threatening. Before the operating employees seek cover they may need to secure their areas. This means they may need to shut off all pumps, close valves and secure any trucks or open containers they are working on at the time of the storm.

2. Notification

Notification that a storm is impending may be made to either the EC or his designee, by any employee monitoring a local radio station. Additional clues that a severe storm may be impending may be rapidly darkening skies, the sound of thunder in the distance, sudden downpours, etc.

3. Preparatory Actions

Since thunderstorms develop quickly and their severity is very unpredictable, it is note worthy that work activities in open areas

and elevated locations may cease when thunderstorms or other adverse weather conditions threaten.

IF LIGHTNING SHOULD STRIKE ANYWHERE IN THE PROCESS AREA AND START GREATER THAN AN INCIPIENT STAGE FIRE, THE FIRE DEPARTMENT WILL BE CALLED.

4. Post Incident Actions

Supervisors are to account for all employees. Once complete, an inspection of the facility should be undertaken to ensure that no damage was suffered. If damage is noted, the EC must be notified.

All electrical equipment involved in the incident must be inspected prior to restarting operations.

1.4.2.2 Tornados

1. Policy

In the event of a tornado sighting priority will be given to notify personnel. Personnel will be directed to areas of refuge or to the most structurally sound areas of the closest site building.

2. Notifications

Notification will be made by the person sighting the tornado from a place of refuge. The person shall issue a general warning to all personnel by dialing 70 and saying something similar to **"Tornado sighted, take cover immediately, I repeat, tornado sighted, take cover immediately."** He will then call specific extensions (3322 Control Room, 0 - Operator) near the refuge areas to make sure the general warning was heard and people are

responding to it. The person will then dial 911 and notify the community emergency response personnel of the sighting.

Areas of Refuge

a.) Administration Building Basement

b.) Employee Lunch Room (Operations) Interior Hallway

c.) Receiving Building 1st floor Restroom

3. Preparatory Actions

Tornado Watch or Tornado Warning If a tornado watch or warning is issued by the National Weather Service the EC shall be notified. The EC shall keep updated on the weather by using local media as a resource and by keeping watch on the sky in immediate area (e.g. WFRO FM 99.1 or AM 900). The EC shall make sure all personnel are notified of the warnings issued by the National Weather Service. The EC has the authority to order facility personnel to shut-down the facility.

4. Post Incident Actions

Supervisors are to account for all employees. If safe to do so, an inspection of the facility should be undertaken to ensure that no damage was suffered. If damage is noted, the EC must be notified.

Notifications must be made to the Region office as soon as possible.

1.4.2.3 Severe cold and snowstorms

1. Policy

The facility has potential to experience problems from cold weather and/or snow. The periods of the severe weather are usually limited to no more than a week at a time. These breaks in the weather generally allow the facility to recover from the freezing problems created by the extreme cold.

The types of problems that the facility may experience are frozen pipes, ice on walking areas, accumulation of ice in containment areas, frozen valves and cold stress experienced by the employees.

2. Notification

No specific notification needed. Facility personnel should be reminded of the dangers of cold stress.

Supervisors and operating personnel need to take precautions to prevent problems from the cold weather. Supervisors will need to check on their employees and make sure they are properly dressed for the weather. The operating personnel will have to prepare for cold weather by having additional clothing available during extremely cold periods.

3. Preparatory Actions

The facility's response to cold weather must be pro-active. Maintenance or contractor personnel will remove snow and ice from key roads, sidewalks and parking lots as soon as they can. Salt may be applied liberally to melt residual snow and ice and to provide better traction.

Operations personnel will be responsible for the active areas of the facility. The two biggest concerns are freezing pipes and slipping hazards caused by the ice and snow. Operations shall be

proactive. Operations personnel are to make visual inspections of the active areas to detect and remediate discovered problems. Ice and snow are to be removed as quickly as possible to reduce the chance of someone slipping and hurting themselves. Personnel can use materials such as salt and sand to increase traction. As ice and snow melt in containment areas it must be pumped up to a storage tank.

Extreme cold might require that additional breaks be given to personnel to allow them to come inside and warm-up. All personnel should be aware of the dangers of coming in to a warm-up and starting to sweat. If sweating occurs the employee could experience accelerated hypothermia due to the moisture near his skin. Therefore, all employees should consider changing clothing before returning to the cold environment to reduce the increased chance of hypothermia due to the wet clothes. It is important that this change of clothing include the socks since the feet are one of the most susceptible areas of the body to the effects of cold weather.

4. Post Incident Actions

All melted snow or ice must be cleaned up as soon as possible to prevent further freezing during another cold event. All pipes, flanges, valves, etc. should be visually inspected to prevent releases or spills due to weather-caused cracks or splits in these pieces of equipment.

1.4.2.4 Earthquake

1. Policy

The site is not located on a seismic fault and is not considered to be any more prone to an earthquake than any other area. Response activities after the occurrence will be similar to any other emergency incident.

2. Notification

No prior notification will be possible.

3. Preparatory Actions

Due to the nature of an earthquake, no prior preparatory actions are possible.

4. Post Incident Actions

Supervisors are to account for all employees. If safe to do so, an inspection of the facility should be undertaken to ensure that no damage was suffered. If damage is noted, the EC must be notified.

1.4.2.5 Flood

1. Policy

The site is not located in a flood plain. Therefore, the facility does not expect to be flooded due to rising waters from local rivers and streams.

2. Notification

None needed.

3. Preparatory Actions

If a flood is imminent, the facility shall attempt to obtain sand bags to utilize as a dam. If this is not possible, the yard tractor may be utilized to build earthen dams.

All paperwork considered vital shall be removed to an area of higher, dry ground or a secure off-site location which will remain dry.

If the water level appears to be rising and rises over any dams, all of the operating units shall be shut down. All of the boilers on the site shall be shut down. All tank valves shall be closed. Electrical supply shall be eliminated where possible. All equipment stored or placed on the floor shall be moved onto table tops when possible. Attempt to remove any vital paperwork to areas which may remain dry.

4. Post Incident Actions

Being cautious of water/electricity hazards, the facility shall be inspected in order to ensure that water damage will not adversely affect start-up of the facility.

1.4.3 <u>BOMB THREATS</u>

a.) Any bomb threats received by the site shall be referred to the EC if possible.

b.) All individuals communicating with the caller shall utilize the <u>Bomb Threat Call Checklist</u> located in Appendix CP-2.

c.) It is critical in the event of a bomb threat that the person receiving the call be calm and courteous. The receiver needs to try to keep the caller on the line as long as possible. By

pretending to have difficulty hearing it is possible to keep them on the line longer.

d.) After the receiver has completed the above information they are to immediately contact the General Manager or his designee, and the Shift Supervisor. They will get together and coordinate the facility's response to the bomb threat.

Items that need to be done by the one of the above people:

1. Call Sandusky County Sheriff's Department at **911** or 332-2613.
2. Determine whether site needs to be evacuated.

2.0 IMPLEMENTATION OF EMERGENCY RESPONSE PROCEDURES

In the event of an emergency which results in fire, explosion or accidental materials release, emergency response activities will be initiated accordingly, following discovery of the event. An assessment of the situation will be performed immediately by the person discovering the incident. A logic diagram of emergency response activities is shown in Figure 2-1. In the event of an imminent or actual emergency, the person discovering the incident will implement the following procedures:

1. Notify the EC and secure the area. The EC can be directly notified by phone or radio on site. If off site, the EC can be directly notified by phone, radio or paging device.

2. The EC is responsible for all emergency response actions. The first step for the EC is to make a preliminary assessment of the situation based on visual observation, verbal communication, or any available data. The emergency will be evaluated using the following criteria and the criteria outlined in Section 1.4.1.

If the event can be controlled and contained on-site **and**, if the event presents no potential hazard to human health, or the environment, the EC will proceed with emergency response procedures detailed herein without activating the Contingency Plan. Post-emergency (cleanup) procedures will be implemented and the necessary reporting will be completed.

If the event poses a threat to off-site human health, or the off-site environment, the EC will contact the appropriate "emergency response" agency(ies) thereby implementing the Contingency Plan. (See Emergency Contact List Table 2-3).

3. Invoking the Contingency Plan

The Contingency Plan will be enacted whenever the EC determines that there is a threat to human health or the environment. Since Vickery employees are trained to handle spills, have personnel protective equipment to work in hazardous environments, the potential for threat to human health to employees on site is controllable. The EC will evaluate the incident's potential to threaten human health if a release has the potential to leave the site line. For potential threat to the environment, the EC will assess the incident based on the potential of the release to leave the property or if outside assistance is needed to remediate the release. Since a large portion of the materials that the Vickery facility handles are aqueous streams, the greatest potential for a threat to the environment involves a release that would threaten the waterways. The soil for the Vickery facility is comprised of mostly clay and migration into the soil is minimal. The Vickery facility has a series of Surface Water management gate that would be closed in the event a spill took place in that surface water management area.

In addition, the Vickery facility is equipped with secondary containment to control any release that might occur from tank farms. The EC will evaluate whether or not the engineered controls have removed the potential for the release to leave the property or to enter Myers ditch. The EC will enact the contingency plan in the following situations:

a. Any fire involving hazardous waste; OR

b. Any explosion involving hazardous waste; OR

c. Any uncontrolled hazardous waste reaction that produces or has the potential to produce hazardous conditions, including noxious, poisonous, flammable and/or explosive gases, fumes, or vapors; harmful dust; or explosive conditions; OR

d. Any fire or explosion that has an increased potential to threaten human health or the environment due to its proximity to a hazardous waste management unit; OR

e. Any hazardous waste release that produces or has a potential to produce hazardous conditions, including noxious, poisonous, flammable and/or explosive gases, fumes, or vapors; harmful dust; or explosive conditions.

f. Any hazardous waste release that produces or has a potential to produce hazardous conditions, including noxious, poisonous, flammable and/or explosive gases, fumes, or vapors; harmful dust; or explosive conditions.

4. The next step is to implement all necessary control measures and ensure that the gate attendant, and other appropriate personnel and response agencies are contacted as necessary (as described in Section 2.1). Contacted individuals or agencies will receive the following information:

   a. Name of person reporting the incident;
   b. Location;
   c. Nature and extent of the incident; and

d. Actions taken and/or recommended.

2.1 NOTIFICATION OF EMERGENCY COORDINATOR(S)

As required by OAC 3745-54-55, at all times, there will be at least one employee on the facility premises or on call (available to respond to an emergency by reaching the facility within a short period of time) with the responsibility for coordinating all internal emergency response measures. This EC is thoroughly familiar with all aspects of the facility's contingency plan, all operations and activities at the facility, the location and characteristics of waste handled, the location of all records within the facility, and the facility layout. The EC has authority to commit the resources needed to implement the contingency plan.

On or before the first of every calendar month, the General Manager or his designee will provide an EC on-call schedule for the month. The schedule will identify the on-call EC for the month. There is one (1) EC on call at all times. The Emergency Coordinators are managers, supervisors and other qualified personnel.

Should an emergency occur, site personnel will reference the on-call schedule and immediately notify the EC.

The EC on call is accessible by phone, radio and\or paging device and is capable of responding immediately. If the event warrants the appearance of the EC at the site after normal working hours, they will inform the site personnel of their estimated arrival time and actions to be taken until their arrival. If their

arrival time is likely to be greater than 30 minutes, they will direct the caller to contact another designated EC and ask him\her to respond until he\she can arrive. In the meantime, site personnel will continue implementing emergency response procedures without awaiting the arrival of the EC.

2.2 REPORTING REQUIREMENTS

The following external contacts are made in the event of a release to the environment of a reportable quantity of hazardous waste <u>inside</u> the facility boundaries:

1. Ohio EPA Emergency Response.....(800)282-9378
2. Ohio EPA - NWDO.....(419)352-8461

The following external contacts are made in the event of a release to the environment of a reportable quantity of hazardous waste <u>outside</u> the facility boundaries:

1. National Response Center.....(800)424-8802
2. Sandusky County Sheriff's Dept....(419)332-2613 or 911
3. Sandusky County Emergency Planning Committee ..... via Sheriff's Office
4. U.S. EPA Region V Office.....(312)353-2318
5. * U.S. Coast Guard.....(216)937-0111

* This agency must be notified if the release is to an off-site waterway.

<u>WELL SHUTDOWN - (FOR POTENTIAL DOWNHOLE PROBLEMS ONLY!)</u>

1. OEPA-NWDO (419)352-8461 (Hazardous Waste Manager)

2. OEPA-Central Off. (614)644-3020 (UIC)

3. Sandusky Co. Board of Health (419)334-6377 (Dave Pollick)
[redacted] (Home #)

2.2.1 Internal Notifications and Responsibilities

Any employee discovering a fire or hazardous materials release must immediately notify the Emergency Coordinator and personnel in the immediate area who may be in danger. The names, addresses and phone numbers of the Emergency Coordinator personnel are provided in Table 2-2. Table 2-2 also lists the names of persons whom the Emergency Coordinator must notify.

2.2.2 Additional Contacts to be Made

A list of additional contacts that may be required during an emergency is listed in Table 2-3.

2.2.3 General Responsibilities

The EC is responsible for coordinating all emergency response measures during an emergency. He acts as the chief of the emergency crew during each operating shift and has complete and total control of all activities during the incident. He has the authority to designate other employees to assist him in the event of an emergency. The EC has been granted full corporate authority to expend all pertinent resources to deal with the situation.

The EC's comprehensive training in emergency response includes:

- Emergency preparedness (Contingency Plan)
- Knowledge of site Evacuation Plan (Section 6.0)
- Incident Response Guidelines
- CPR (optional)
- First Aid (optional)
- Use of fire extinguishers

If the Contingency Plan must be implemented, the EC will develop and maintain lines of communication with key community emergency services including fire and police agencies, medical facilities and emergency response units as appropriate for the incident. Section 8.0 delineates the arrangements which will be made with such organizations to assure their availability and assistance in emergency situations.

The EC is authorized to activate emergency response procedures by assembling equipment and determining its application. Section 4.0 describes the emergency equipment available to the EC, both from on-site and off-site resources.

The EC will determine the need to report to outside agencies. In the event of a spill or hazardous waste release (of a reportable quantity to the environment), a report to OEPA will be made within twenty-four (24) hours. If the EC determines that the release could threaten human health or the environment outside the facility, this notification will be made immediately. The person making such notification will give the following information:

- Name and telephone number
- Name and address of facility
- Time and type of incident (e.g., release, fire)

- Name and quantity of material(s) involved, to the extent known
- Extent of injuries, if any
- Possible hazards to the environment and human health outside the facility

2.2.4 Identification of Material and Hazard Assessment

As soon as possible the EC will determine the character, source and extent of any released materials by visual inspection and reference to manifests, sample analyses, Waste Material Profile Sheets and other available sources of information.

Initial assessment includes the following parameters:

- Source of the release
- Condition of the source: e.g., repairable leak, uncontrollable leak, easily moved, unmovable
- Container identification; e.g., label or placard information, type and size of individual containers
- Physical state and nature of the material; e.g., solid (powder, pellet, granular), liquid or gas
- Odor, if noticed; e.g., a pleasant smell (almond, ammonia, benzene, vinegar) or an unpleasant smell (sulfur, skunk, onion, sharp, biting, cleaning fluid, or paint)
- Noticeable reaction; e.g., fuming, flaming or gas evolution.

After the materials have been identified to the fullest extent possible, the EC must assess possible hazards, both direct and indirect, to human health or the environment and notify the appropriate site personnel and authorities.

The EC's hazard assessment will include information gathered from other site personnel. The Casualty Control Officer (CCO) will access the status of all on-site personnel. The CCO will relay information concerning injuries or casualties and, if necessary, notify the casualty control agencies listed in Table 2-3.

Based on his knowledge of the existing conditions, the EC will determine the following:

- Can facility personnel control the emergency? If not, he will immediately involve and notify the appropriate local, state, and federal agencies identified in Table 2-3.

- Is site evacuation necessary? If so, he will activate the Evacuation Plan (Section 6.0). If partial evacuation is required, the location of the on-site regrouping area will be designated.

- Is evacuation of local area advisable? If so, he will communicate necessary information to the Sandusky County Sheriff.

2.3 CONTINGENCY PLAN IMPLEMENTATION

Sections 1.4.1 and 2.0 identify situations which might potentially require implementation of the Contingency Plan.

2.3.1 Cleanup After Contingency Plan Implementation (OAC 3745-54-56/40 CFR 264.56)

After implementation of the Contingency Plan and after the incident is under control, the EC must ensure that, in the affected area(s) of the facility:

(1) No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed; and

(2) All emergency equipment listed in the Contingency Plan is cleaned and fit for its intended use before operations are resumed.

The owner or operator must notify the Director of OEPA and/or the Regional Administrator, and other appropriate State and local authorities that the facility is in compliance with this section, 2.3.1 (or OAC 3745-54-56/ 40 CFR 264.56), before operations are resumed in the affected areas(s) of the facility.

2.3.2 Report to the OEPA Director/Regional Administrator (OAC 3745-54-56 /40 CFR 264.56)

The incident will be noted in the operating record including the time, date, and details of the incident that required implementation of the Contingency Plan.

Within 15 days after the incident, a written report must be submitted to the Director of OEPA and/or the Regional Administrator.

The report must include:

- Name, address, and telephone number of the owner or operator;

- Name, address, and telephone number of the facility;
- Date, time, and the type of incident (e.g., fire, explosion, etc.);
- Name and quantity of material(s) involved;
- The extent of injuries, if any;
- An assessment of actual or potential hazards to human health or the environment, where applicable; and
- Estimated quantity and disposition of recovered material that resulted from the incident.

Waste material recovered from the incident will be properly disposed of at the Vickery facility or sent off site to an alternate disposal facility.

3.0 CONTAINMENT AND CONTROL ACTIVITIES

3.1 GENERAL PROCEDURES

The facility's operations are designed to minimize the potential hazards to facility personnel, and to contain spilled or leaked materials and prevent their movement from the facility. Operational features and response activities are presented below.

3.1.1 Facility Provisions

Rainwater not accumulating in tank containments or other hazardous waste management areas flows off site. The Surface Water Management System as described in the Surface Water Management Plan (PTI 03-1567), makes possible the control of onsite surface water flow using dikes, surface grading and flow control gates. Flow control gates can be closed in the event of a material release outside a contained area. Waters associated with these events are disposed of by deepwell injection.

The well houses, pump houses and filter buildings have curbed floors. The treatment/storage tanks have secondary containment. Rainwater accumulating in tank containments is disposed of by deepwell injection.

Processing and storage tanks are equipped with level indicators and alarms where appropriate. Pressures are monitored in all injection wells. All high pressure waste transfer lines are contained within a secondary enclosure (pipe within a pipe) which, in the event of a line breakage or other failure, directs wastes to a leak detection unit which immediately sounds an alarm in the

control room. Catastrophic high pressure line breaks result in automatic feed pump shutdown.

The facility is equipped with emergency electrical generators which supply power to the site areas as necessary.

The facility has developed and implemented a detailed inspection program designed to detect potential problems and discrepancies before an incident occurs. Inspections of the various process and storage areas as well as containment, alarm systems, communications and other emergency/safety equipment are conducted on a daily, weekly and monthly basis. These plans are revised when changed to the operations require modification or revision.

3.1.2 Personnel Response Activities

Vickery is prepared to respond to incidents at the facility which could cause potential emergencies, e.g., fires, explosions, spills or material releases as discussed in Section 1.4.1. Containment and control activities are initiated by the EC, who will activate facility personnel responses as follows:

Emergency Coordinator (EC) Activities

For a spill or release the EC or his designee will mobilize personnel and:

- Perform Hazard Assessment and formulate action plan for incident.
- Assemble the required response equipment: protective clothing and gear, heavy equipment (scrapers, back hoe), absorbent material (such as oil dry or sand), empty drums, drum overpacks and plugging materials.

- Determine the most appropriate containment or diking method: Earthen berms or ditches, or excavation and dikes.
- Coordinate activities of supervisory personnel and maintain constant communication with them and response teams.

For a fire or potential explosion, and to guard against a spill caused by the latter, the EC or his designee will mobilize personnel and:

- Assemble required response equipment: Emergency equipment (protective clothing and gear); fire extinguishers; water truck and heavy equipment; diking and neutralization material; and empty drums, pumps, vacuum trucks and tank trucks.
- Determine the best method of approach and containment:
  - Move in from upwind side. Never walk in or through flammable liquids or ground soaked with flammable or unknown liquids.
  - Use dry chemicals for fire suppression of flammable liquids and in situations where flash-back potential exists during cleanup of residues.
  - Use on-site water truck to flood adjacent flammable materials to cool them and control spread of fire.
  - If outside of containment area, use soil for residue containment or use adsorbents if control by earthen dikes is not possible.
- Fire fighting activities will be limited to incipient stage fires. Fires or <u>potential</u> fires beyond the suppressing capabilities of fire extinguishers or garden hoses will be relegated to the local Fire Department.

Communications Coordinator Activities

For a spill release, fire, or explosion, the Communications Coordinator (CC) will:

- Establish telephone contacts as directed by the EC.

Casualty Control Officer Activities

For an uncontrollable spill, release, fire, or explosion, the designated Casualty Control Officer (CCO) will:

- Coordinate movement of personnel to regrouping areas as follows (and relay information to EC):
  1. Parking lot adjacent to the storage garage south of the facility on St. Rt. 412
  2. Gate entrance to west end of facility on Twp. Rd. 244
  3. Any safe area as designated by the EC and Conduct a "head count" and relay information to EC. The "head count" will be compared to the shift roster, administrative office sign-in log for staff and visitors, the sign-in/sign-out sheet at the guardhouse, and\or Receipt Control office, the contractor sign-in/sign-out sheet at the guard house and\or Receipt Control office.

Remediation Personnel Activities

- Under the direction of the EC, these personnel may after a spill or release has been discovered:
  1. Respond to releases with a purpose of stopping or reducing the flow of the leak or release.
  2. Respond to releases or potential releases of hazardous substances as a part of the initial site

response for the purpose of protecting nearby persons, property, or environment.

3. Contain and remediate the release through plugging, diking, or patching affected areas.
4. Personnel will respond to site emergencies such as acid, caustic, leachate releases or spills, releases to the atmosphere and mechanical failures caused by sources listed in the plan. Personnel will only respond to off site emergencies at the request of the local authorities when the spill is of a nature to spills experienced at the site.

Regulatory\Technical Personnel Activities

- These personnel are summoned by the EC to assist in managing the incident from a regulatory or technical aspect. The personnel may be assigned additional duties as the EC sees fit.
- Additional duties could be but are not limited to directing remediation, maintenance decontamination, site control, communications or casualty control activities. These additional duties assigned will be in accordance with the respective training level of the regulatory/technical personnel.

3.1.2.1 Employee Right to Refuse Hazardous Remediation Assignments

Employees of Vickery have the right to refuse a work assignment when the employee believes that the work assignment will put his/her personal safety in jeopardy or when the employee feels that his/her level of training does not qualify them to perform the work assignment safely.

3.1.2.2 Incident Command System

- Where an event occurs and the contingency plan\emergency response plan is not activated, the incident command system shall be as follows:

  The EC shall be in charge of the incident and shall have access to those site resources necessary to control and remediate the incident. The EC shall have the authority to assign site personnel as he\she sees fit. The EC shall have the authority to expend site monetary resources in order to control and remediate an incident.

  The Casualty Control Officer, Communications Coordinator and other personnel assigned a task during an emergency response has the authority to assign site personnel to related duties after conferring with the EC.

  - Where an event occurs and the contingency plan\emergency response plan is activated and outside assistance is obtained from the fire department or other government agency, then the highest ranking official shall be in charge of the scene. Vickery employees shall take directions from that person. The local fire chief shall assume control of the scene upon his arrival on site.
  - Where an event occurs and Vickery employees are asked to assist local government agencies in responding to an environmental or other emergency, the Vickery employees shall take their directions from the Fire Department

Chief or the next highest ranking official at the scene. Vickery employees shall not control the incident scene or act without direction from the Incident Commander.

- Where a Vickery employee believes that participation in an emergency response activity will exceed his training or place the employee's safety at risk, the employee may request an alternate assignment by the EC and must be granted.

3.1.3 Spill Response Procedures

3.1.3.1 Reporting Spills

- Any employee is to report as soon as possible any spills or material release to the EC . Reports of spills should provide:
  - location
  - type of discharge
  - existence of fire or personal injury
  - immediate threat to on-site personnel
  - threat of surface waters or groundwater migration
  - name of employee
- The EC or his designee will report within twenty-four (24)* hours all spills or material releases in excess of one pound/pint to the following:
  - Ohio Environmental Protection Agency....(419) 352-8461 and (800) 282-9378

*If the EC determines that the release could threaten human health or the environment outside the facility, this notification will be made immediately and a report will be made to the following:

- National Response Center.....(800) 424-8802

Upon judging the size and condition of the spill, the EC will determine if evacuation procedures are necessary.

3.1.3.2 Controlling Spills

In the event of a spill of hazardous materials or hazardous wastes, the following procedures will be instituted:

- The EC will go to the location of the spill. He or his designee will initiate spill control and containment action immediately.
- For spills from pipes, pumps or valves, the EC or his designee shall:
  - discontinue transfer operation if in process
  - valve off leaking equipment
  - ensure that secondary containment contains released materials; remedy leak sources.
- For spills from tanks, the EC or his designee shall:
  - discontinue transfer operation if in process
  - identify lowest point of break in tank surface
  - reduce liquid level in tank below lowest point of break by transfer to another tank or tank truck

- ensure that secondary containment contains released materials; remedy leak sources.

o For spills of sufficient magnitude to cause an emergency pollution problem, the EC or his designee shall notify, as appropriate:
  - National Response Center
  - Region V Environmental Protection Agency
  - Ohio Environmental Protection Agency
  - Sandusky County Sheriff's Department
  - Townsend Township Fire Department
  - U.S. Coast Guard (for oil spills)

3.2 PROCESS-SPECIFIC PROCEDURES

Each storage, treatment, and disposal unit at the facility will have built-in control features, containment structures or equipment to facilitate emergency response procedures. The general procedures in Section 3.1 will apply to all areas of the facility; however, containment and control activities specific to each process unit are shown in Appendix CP-1.

3.3 SITE SECURITY AND CONTROL

Site security and control during an emergency response incident will be provided as follows:

o The EC or Incident Commander will be responsible for having a hot zone, warm zone, and cold zone established and supervised by site or other designated personnel.

o Access through the cold zone, support areas and the corridor to the hot one will be controlled to prohibit unauthorized personnel such as news persons, onlookers or

unnecessary response personnel from entering contaminated areas.

- Access from the hot zone will be controlled to ensure that personnel and equipment are decontaminated before the latter are allowed to exit into the cold zone.
- The EC or his designee will ensure that, where practical physical barriers are erected to prohibit access to unauthorized area.
- The assistance of local law enforcement agencies will be asked to maintain and patrol areas where site security and control is necessary.
- Site security and control will be maintained until all equipment has been decontaminated, equipment and process checks have been completed, and the emergency has been terminated by the EC or incident commander.

3.4 CONTAMINATION CONTROL

The Vickery Site Contamination Control Procedure will be followed when:

1. Decontaminating site or other emergency equipment;
2. Decontaminating personnel;
3. Establishing a contamination control strategy; and
4. Contingency Plan/Emergency Response activities are required.

4.0 AVAILABLE EMERGENCY EQUIPMENT

The facility will maintain an alarm system, a communication system and an inventory of equipment suitable for emergency response. The on-site equipment will enable facility personnel to react and respond to the majority of emergency incidents which may arise. If needed, supplemental emergency equipment supplies will be available from outside sources.

4.1 ALARM AND COMMUNICATION SYSTEMS

The Facility's Administration/Laboratory Building and Employee Lunchroom and Shower Building are equipped with central station fire detection and alarm systems. The systems can be activated automatically through the use of smoke and heat sensor units or manually by wall mounted, push button controls located at various points throughout the building. A master control unit is located on the first floor of the Administration Building, adjacent to the base radio station. This unit, upon receipt of a signal from either the smoke/heat sensors or one of the manual activators, sends an electrical impulse which activates the building's evacuation horns. At the same time, a signal is sent through a special telephone line to an outside communication service which quickly contacts/dispatches the facility's local fire department. A second call is initiated directly to the facility to inform site personnel of the received alarm.

The facility will be equipped with a communications network to link both on-site and off-site resources. Off-site communications will be available via the local telephone system. Telephones will

be located in the following buildings and treatment units a shown in Figure 4-1:

Truck Wash/Unloading Building
Office Building
Main Laboratory
Maintenance Shop
Receipt Control
Guard House
Pump Houses Nos. 1, 2, 3, and 5
Filter Building 1 and 2
Employee Lunchroom/Locker Room
T-Tank Pump House
Control Room

On-site communications are through the telephone system and two-way radio. The two-way radio system consists of a base station in the Control Room at the Truck/Unloading and Wash Building, and numerous mobile and portable hand-held units. The mobile units are located in various on-site vehicles.

Maintenance Department Vehicle(s)
Operations Department Vehicles

The two-way radio system will be used for intra and extra site communications in the event of a power failure. In addition, a messenger could be sent to the Sheriff's Dept. which is located approximately 5 miles west of the site off of State Route 412.

When off-site emergency response assistance is required from a government jurisdiction such as the Fire Dept., the EC or the designated Communications Coordinator shall ensure that the Incident Commander is provided with a site two-way radio.

When personnel are dressed out in P.P.E., the following methods of communication will be maintained where practicable during emergency response activities:

1. Two way radio
2. Respirators with speaking diaphragms and/or two-way radios
3. Hand signals which are universally understood or which are discussed by the emergency response team members prior to entering the hot zone.

Alarm System

Two-way radios in conjunction with the telephone paging system is available for use as a site alarm system for employees not located in buildings.

Automatic alarms with a manual capability exist in the Administration Building and Lunchroom. The automatic alarms are wired to an alarm service.

Communicating Spills

- Any employee is to report as soon as possible any spills or material release to the EC. Reports of spills should provide:
  - location
  - type of discharge
  - existence of fire or personal injury
  - immediate threat to on-site personnel
  - threat of surface waters or groundwater migration
  - name of employee

- The EC or his designee will report all spills or material releases in excess of one pound/pint in accordance with Section 3.1.3.1 of this plan.

Upon judging the size and condition of the spill, the EC will determine if evacuation procedures are necessary.

4.2 ON-SITE EQUIPMENT

The primary emergency response equipment available at the site will include the following, the location of which is shown in Table 4-1.

- ABC type extinguishers
- Emergency eyewash and shower units
- First aid stations
- Personal safety and protective equipment
- wind sock

Various types of fire extinguishers, all rated for fire types A, B, or C, are located throughout the facility as shown in Table 4-1. Water will be supplied by the facility's wells. Spigots for garden-size hoses are scattered throughout the facility.

Eye wash and safety showers are located in areas with potential for personal contact with wastes.

An example of respiratory protective equipment available at locations throughout the facility is shown on Table 4-1.

A first aid station is located on the second floor of the Truck Unloading and Wash Building.

An example of spill containment and cleanup equipment available at the facility is listed in Table 4-1.

Employees will be issued the following safety equipment as required. This equipment will be worn when performing work in areas where there is a possibility of exposure to hazardous wastes.

- Chemical resistant rubber suits (PVC)
- Chemical resistant boots (PVC)
- Full face cartridge respirators (air purifying)
- Full face shield
- Chemical resistant gloves
- SCBA's or supplied air respirators where air monitoring or safe work practices require a high level of respiratory protection.*
- Level B and Level C, P.P.E. will be assigned according to the hazard presented by the emergency.
- Boots, gloves and chemical suits are considered disposable after a spill requiring the activation of the Contingency Plan.

A wind sock is located atop storage tank T-9 located towards the back of the plant. This wind sock, which is illuminated at night, is a reliable device to site personnel in determining wind direction and approximate velocity.

4.3 OFF-SITE RESOURCES

* Vickery Site employees will not be assigned to work in an atmosphere immediately dangerous to life or health.

Supplemental emergency equipment and supplies, contracting services, etc., will be available, if needed, from off-site (outside) sources. The Townsend Township and Clyde City Fire Departments are fully equipped and trained to respond to incidents at the facility. Back-up resources, including an aerial truck are available from the City of Fremont.

The facility is serviced by the county-wide and regulated E.M.S. system (Sandusky County E.M.S.) and a private provider (Bellevue E.M.S., Inc.). Both services are fully equipped and personnel trained in all aspects of basic and advanced life support procedures and rescue techniques. Most on-site spills can be handled by facility personnel. In the event additional resources are required (or a spill occurs off-site), the following contractors may be contacted for assistance:

IT Corporation
P.O. Box 1002
16404 St. Rt. 224, East
Findlay, OH 45840
(419) 423-3526 or 1-800-537-9540

Cousins Waste Control (A Division of Philip Services)
1801 Matzinger Road
Toledo, OH 43412
(419) 726-1500 or 1-800-433-6754

5.0 CASUALTY CONTROL

The EC shall determine the existence or probability of on-site casualties and is responsible for activating the casualty control plan and designating a Casualty Control Officer.

1. The Casualty Control Officer (CCO) will assess, implement, and direct first aid for any and all injuries. The CCO will also advise the EC of the need to summon outside emergency medical assistance.
2. The Casualty Control Officer will give the details of the emergency assistance needed to the EC or his designee.
3. The EC or his designate will call the following Emergency Medical Service agencies as needed:
   a) Sandusky County E.M.S.....(419) 334-4401
   b) Bellevue 4 County Ambulance Service.....(419) 483-3322
4. When calling for emergency medical assistance, the following information must be given:
   a) The address and location of the emergency
   b) Nature of the emergency
   c) An estimate of numbers, types and conditions of Casualties
   d) The existence of hazardous conditions or special risks
   e) The name, number, and location of caller
5. The Casualty Control Officer will coordinate search and rescue operations.
6. The Casualty Control Officer will designate and inform the EC and search and rescue staff of the location of the

Triage Area, and the Casualty Receiving Area (first aid station).

The Casualty Receiving Area will be located at the:

Employee Lunchroom/Locker Room Building

In case the employee lunchroom/locker room building cannot be used, the alternate Casualty Receiving Area is the:

Lunchroom - Administration Office

7. Casualties that can be safely moved by on-site personnel will be transported to the Casualty Receiving Area.
8. The Casualty Control Officer will designate a technical person to help identify injury causing hazardous agents and provide information on toxicity and decontamination.

   If needed, the following organizations may provide emergency chemical information:

   Chemtrec.....(800) 424-9300

   Poison Control Center located at the Medical College of Ohio at Toledo .....(419) 383-3897
9. The Casualty Control Officer will ensure that incoming emergency medical assistance will be escorted to the Casualty Receiving Area or emergency location.
10. The Emergency Medical Service (E.M.S.) will assume control of casualty treatment and disposition when they arrive.
11. The Casualty Control Officer shall maintain a record of all casualties; listing names, injuries, and disposition.

6.0 EVACUATION PLAN

The EC is the only person authorized to call for complete evacuation of the site in response to an emergency situation which threatens the health and safety of facility personnel. He may take this action based upon his analysis of the situation or at the request of an on-scene public emergency services coordinator, e.g., Sheriff, Fire Chief.

6.1 SITE ACCESS AND EGRESS

The facility is located about eight (8) miles east of Fremont, Ohio. The site can be reached by road from State Highway 510 from the north or south and State Highway 412 from the east or west. Township Road 244 runs north and south along the western perimeter of the site intersecting State Route 412 at the south end. The Ohio Turnpike (U.S. 80) running east to west, lies parallel, and just north of the facility, with service plazas located approximately one mile east of this site. The area surrounding the site is predominantly farm land, with residences located within 1/8 mile to the east and west, adjacent to the site from the south and approximately 1/2 mile to the north.

The site is designed and operated to facilitate access to all points within the site for inspection and emergency response.

Enclosed processing areas are designed for emergency response and evacuation, if necessary.

Facility access is controlled and maintained during an emergency. The EC will determine the personnel to be admitted during an emergency.

6.2 EVACUATION PROCEDURES

The evacuation routes for the facility are shown in Figure 6-1.

The following actions will be taken when the EC orders a site evacuation.

1. The EC or his designee will activate emergency services by calling the Sandusky County Sheriff's Department for assistance, reporting any casualties and arranging for their emergency care. The EC will coordinate activities with the sheriff and/or other emergency agencies.
2. The EC or his designee will determine which gates will be used depending upon wind direction and the locations of the incident and personnel. The EC and/or his support staff will utilize the windsock located atop tank T-9 to ascertain wind direction and velocity.
3. The EC will broadcast evacuation instructions to area supervisors via the facility's telephone paging system and/or two-way radio system.
4. The EC will instruct site personnel to unlock the required exit gates and assist in directing evacuation.
5. All personnel, including visitors and contractors, will be instructed to leave through the exit gates designated by the EC.
6. Gate attendants are to remain at their stations to assist in accounting for outside contractors until they are relieved by the EC or his designee, or until such time as the emergency situation becomes a threat to their safety or health. No employee is to remain in an area if their safety or health is at risk.

7. Evacuation will proceed as follows:
   If downwind of incident, evacuate perpendicularly to wind direction over the most accessible route. If upwind of incident, evacuate in upwind direction.
8. Personnel will regroup at one of the following areas as designated by the EC:

   Regrouping Area 1 - Parking lot adjacent to the storage garage south of the facility on State Route 412.

   Regrouping Area 2 - Gate entrance to west end of facility on Twp. Road 244 (Haymill Area).
9. Once all personnel have been evacuated, plant gates are to be closed to prevent unauthorized personnel from re-entering the facility. If gates must remain open to facilitate entrance by emergency crews, a representative of the company designated by the EC will be stationed at the gate entrance. Another facility representative will be stationed at the entrance to the administrative office to prevent unauthorized entrance into the office or employee locker room.
10. The Casualty Control Officer (CCO) will initiate a head count and check it against the site attendance system. This information will be transferred to the EC.
11. All attempts to rescue or find persons will be directed by the EC or his designee in conjunction with the responding agencies.
12. In the event of a tornado or severe wind storm, all personnel will be directed to the Employee Lunchroom/Locker Room, the basement of the main office

building, or the ground floor central area of the Truck Unloading Building.

13. Upon activation of the fire alarm system located at the Administration/Lab Building, the following actions will taken:

    All personnel located inside the building or its adjacent structures will evacuate immediately and relocate to a safe area upwind and away from the fire. The EC or his designee is responsible for the administrative office sign in/sign out sheet during an evacuation. The Shift Supervisor/EC shall be contacted immediately and upon notification of the exact location of the fire, confirm with the Control Room Operator or Telephone Operator, that the fire department has been contacted.

    If the fire is out of control, the EC shall make sure that all personnel maintain a safety distance away from the fire. In addition, if possible, all adjacent vehicles are to be moved to another location to reduce the likelihood of further involvement and also allow for ample work area for responding emergency units.

    The site fire response will be one of an incipient nature. That is site personnel may respond to fires of a magnitude which may be suppressed with extinguishers or a garden hose.

14. The evacuation routes from specific site buildings are indicated by the emergency exit signs located within the buildings. The evacuation routes of each building are very evident in light of the locations of the emergency exit signs, the buildings consist of one room, or each

occupied room on site contains an exterior window or door (except the driver's room in the unload building).

15. For a spill release, fire, or explosion, the Communications Coordinator (CC) will:
    - Establish telephone contacts as directed by the EC

Casualty Control Officer Activities

For an uncontrollable spill, release, fire, or explosion, the designated Casualty Control Officer (CCO) will:

- Coordinate movement of personnel to regrouping areas as follows (and relay information to EC):
    1. Parking lot adjacent to the storage garage south of the facility on St. Rt. 412.
    2. Gate entrance to west end of facility on Twp. Rd. 244.
    3. Any safe area as designated by the EC and conduct a "head count" and relay information to EC. The "head count" will be compared to the shift roster, administrative office sign-in log for staff and visitors, and the contractor sign-in/sign-out sheet at guardhouse and\or receipt control.

6.3 COMMUNITY IMPACT CONSIDERATIONS

In the event that areas adjacent to the site may be endangered due to the emergency, the evacuation will be initiated and controlled by the Sandusky County Sheriff's Department. The following responsibilities have been determined:

- The EC will notify the Sandusky County Sheriff's Department of the possible need to evacuate off-site areas. This need will depend on the nature, extent and

rate of spread (including direction) of potential hazards to surrounding areas.

- Until local units can respond, facility personnel will, under the EC's direction, initiate roadblocks and evacuation procedures for areas adjacent to the site. This will be done, provided there are available personnel.
- The EC will maintain communication with local authorities and assist in the coordination of evacuation, emergency response and casualty control activities.

6.4 RE-OCCUPANCY OF FACILITY

The determination of when the facility may be safely reoccupied will be made by the EC in consultation with responding emergency services agencies. Site activities will only resume after the EC has given an "all clear" notification.

7.0 POST-EMERGENCY PROCEDURES

Post-emergency procedures are designed to prevent reoccurrence, to clean up and dispose of residuals, to decontaminate equipment and to provide for personnel debriefing.

7.1 PREVENTION OF RECURRENCE

The EC will take all necessary steps to ensure that a secondary release, fire or explosion does not recur. If the facility stops operations in response to a fire, explosion or release, the EC must ensure that the following procedures are carried out:

- Monitoring of all pressure valves
- Inspection for any leaks or cracks in pipes, valves, and tanks
- Inspection for gas generation
- Isolation of all collected waste materials

All operations that were initially shut down during response to the incident will not be reactivated until the EC and/or the General Manager gives the approval.

7.2 CLEANUP AFTER CONTINGENCY PLAN IMPLEMENTATION (OAC 3745-54-56/40 CFR 264.56)

After implementation of the Contingency Plan and after the incident is under control, the EC must ensure that, in the affected area(s) of the facility:

1. No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed; and
2. All emergency equipment listed in the Contingency Plan is cleaned and fit for its intended use before operations are resumed.

The owner or operator must notify the Regional Administrator and/or the Director of OEPA, and other appropriate State and local authorities that the facility is in compliance with this section, 7.2 (OAC 3745-54-56 40 CFR 264.56), before operations are resumed in the affected area(s) of the facility.

7.3 REPORT TO OEPA DIRECTOR/REGIONAL ADMINISTRATOR (OAC 3745-54-56 /40 CFR 264.56)

The incident will be noted in the operating record including the time, date, and details of the incident that required implementation of the Contingency Plan.

Within 15 days after the incident, a written report must be submitted to the Director of OEPA and/or the Regional Administrator. The report must include:

1. Name, address, and telephone number of the owner or operator;
2. Name, address, and telephone number of the facility;
3. Date, time, and the type of incident (e.g., fire, explosion, etc.);
4. Name and quantity of material(s) involved;
5. The extent of injuries, if any;

6. An assessment of actual or potential hazards to human health or the environment, where applicable; and
7. Estimated quantity and disposition of recovered material that resulted from the incident.

Waste material recovered from the incident will be properly disposed of at the Vickery facility or sent off site to an alternate disposal facility.

7.4 REOCCUPATION OF FACILITY OR EMERGENCY RESPONSE HOT ZONE

The EC will determine when it is safe to reoccupy the facility.

7.5 PERSONNEL DEBRIEFING AND CONTINGENCY PLAN REVIEW

The EC and General Manager and other appropriate personnel will review preparedness and prevention activities, response activities, casualty control and evacuation procedures with all involved personnel. Based on this review, suggestions for revisions to the Contingency Plan will be made to facility management. The review for all Contingency Plan events will be in writing.

8.0 ARRANGEMENTS WITH LOCAL AUTHORITIES AND OTHER RESOURCES

Vickery has made contact with those local and regional agencies listed in Table 8-1 which may be involved in an emergency situation. Each of these agencies have been provided with a current copy of this Contingency Plan and relevant background information. Letters of notification of any changes to the Contingency Plan will be on file at the Vickery Facility with acknowledgment of receipts.

8.1 EMERGENCY RESPONSE AGENCIES

The EC will notify certain agencies if the Contingency Plan is implemented. Townsend Township Fire Department is the primary authority in an emergency.

The County Sheriff's Department has agreed to assist in the movement of emergency personnel and equipment. Additionally, they have agreed to take the lead in the evacuation of areas surrounding the site, if necessary. The Ohio State Highway Patrol will assist in traffic control and evacuation.

Townsend Township and Clyde City Fire Departments have been provided a copy of the Contingency Plan. The fire departments role will be concentrated about fire control and prevention as well as emergency response duties suitable to the fire departments and their level of training.

8.2 COMMUNITY EMERGENCY RESPONSE ORGANIZATIONS' ROLE

The community's role in responding to emergencies at the Vickery Facility is categorized into the following responses:

- fire suppression
- protect structures from fire impingement
- search and rescue
- medical treatment
- medical transport
- logistical support for breathing air
- manpower for diking activities
- traffic control
- evacuation assistance
- remediation activities
- logistical support for emergency response activities

8.3 VICKERY'S OFF SITE EMERGENCY RESPONSE LEVEL

Vickery will respond to environmental or other emergencies to the best of its ability with manpower and\or equipment when called upon by the community.

Vickery shall respond to environmental emergencies with available manpower and equipment when the emergency involves materials which the site has had experience handling. For other response scenarios Vickery will provide available equipment upon request by the community.

8.4 COMMUNITY EMERGENCY RESPONSE ORGANIZATIONS INTERFACE WITH VICKERY

Vickery Emergency Response Training or interface activities shall on an annual basis include one of the following:

- An invitation to local emergency response organizations to participate in a Vickery site emergency response drill. Organizations are familiarized with site emergency response capabilities.
- A presentation to local emergency response organizations which discusses the Vickery Site Emergency Response Plan and the Community Emergency Response Organization's Role. The focus of this presentation will be the local fire departments and emergency medical services groups.

9.0 INCIDENT REPORTING

Section 103 of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) requires that notification be made to the National Response Center (800/424-8802) whenever there is a release of a hazardous substance to the environment outside the facility boundaries in amounts equal to or greater than the "reportable quantity".

OAC 3745-54-56 (J) and 40 CFR 264.56 further state that any emergency event requiring the implementation of the Contingency Plan will be reported in writing within 15 days to the Director of the Ohio EPA and the Regional Administrator.

Any reportable material release or waste spill must be reported to OEPA in accordance with Section 3.1.3.1 of this plan.

9.1 INCIDENT MITIGATED ON-SITE (Contingency Plan not Implemented)

- Report the incident internally on a completed report form after the incident is controlled.
- File an incident report with the facility manager and maintain incident reports in the facility's central file.

9.2 IMPLEMENTING THE CONTINGENCY PLAN

- Report the incident to local authorities and request emergency support, as needed.
- If off-site human health or environment are threatened, report the incident verbally to National Response Center,

the Sandusky County Emergency Planning Committee through the sheriff's office and the Ohio EPA, immediately.

- Report the incident internally on a completed incident report form after the situation is controlled.

9.3 CLEANUP AFTER CONTINGENCY PLAN IMPLEMENTATION (OAC 3745-54-56/40 CFR 264.56)

After implementation of the Contingency Plan and after the incident is under control, the EC must ensure that, in the affected area(s) of the facility:

1. No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed; and
2. All emergency equipment listed in the Contingency Plan is cleaned and fit for its intended use before operations are resumed.

<u>The owner or operator must notify the Regional Administrator and/or the Director of OEPA, and other appropriate State and local authorities that the facility is in compliance with this section, 2.3.1 (OAC 3745-54-56 40 CFR 264.56), before operations are resumed in the affected area(s) of the facility.</u>

9.4 REPORT TO OEPA DIRECTOR/REGIONAL ADMINISTRATOR (OAC 3745-54-56 /40 CFR 264.56)

The incident will be noted in the operating record including the time, date, and details of the incident that required implementation of the Contingency Plan.

Within 15 days after the incident, a written report must be submitted to the Director of OEPA and/or the Regional Administrator. The report must include:

1. Name, address, and telephone number of the owner or operator;
2. Name, address, and telephone number of the facility;
3. Date, time, and the type of incident (e.g., fire, explosion, etc.);
4. Name and quantity of material(s) involved;
5. The extent of injuries, if any;
6. An assessment of actual or potential hazards to human health or the environment, where applicable; and
7. Estimated quantity and disposition of recovered material that resulted from the incident.

10.0 AMENDMENTS TO CONTINGENCY PLAN

This Contingency Plan is subject to review and amendment, if:

1. Deficiencies in the Plan are noted.
2. The facility permit is revised.
3. The facility changes in design, construction, operation, or other circumstances develop that change the potential for fires, explosions, or releases of hazardous materials.
4. The list of ECs and alternates changes.
5. The list of emergency equipment changes substantially.
6. The applicable regulations are revised.
7. The plan fails in an emergency (OAC 3745-54-54/40 CFR 264.54)

Any significant change in the Contingency Plan that impacts an agency will be reviewed and discussed with that agency or emergency response authority. New Contingency Plan documents will be prepared and distributed by certified mail to local, state, and federal agencies. Facility personnel will be informed of all changes in the Plan with copies available to personnel responsible for its implementation.

This Contingency Plan may be updated when technological advances, changes in government regulations, corporate procedures, market availability, or more efficient management practices warrant a change. Some anticipated areas where changes may occur are listed below:

- Procedures
- Sampling Equipment
- Operations Equipment

- Remedial Equipment and Supplies
- Specific inventories of itemized equipment and supplies

When changes referred to in the above paragraph occur, the Ohio EPA will be notified verbally or in writing.

11.0 TYPES OF WASTES RECEIVED BY THE FACILITY

This section describes the chemical and physical nature of the hazardous wastes received and managed at the facility and expected to be received and managed at the proposed facility.

CHEMICAL AND PHYSICAL CHARACTERISTICS

The wastes currently received by the existing IAWTS facility are best described by the three categories of wastes delineated in Table 11-1. The waste categories include acids/acid waters, caustics/caustic waters and neutral waters . Table 11-1 defines typical EPA Hazardous Waste numbers for each type of waste.

In the existing facility, where all wastes are treated in the Waste Treatment/Storage Tanks, segregation of wastes into the separate treatment systems is not necessary.

Vickery will use the Waste Analysis Plan to fully describe and categorize received wastes and ensure compliance with applicable regulations. The WAP also ensures that incompatible wastes are properly segregated.

12.0 EMERGENCY MEDICAL AND FIRST AID PROCEDURE

In the event medical treatment is required by personnel located on site, the following procedure shall be followed:

12.1 NOTIFICATION

All injuries should be reported to the Safety Department. An injury would include a wound which merely receives simple first aid as the only treatment.

12.2 INJURY TRIAGE

1. Injuries which are more severe than simple first aid cases will be triaged/assessed by a person trained in CPR/First Aid.
2. The extent of the injury and the immediate care to be provided to the victim will be decided and provided.
3. Emergency transportation and medical assistance will be summoned at this time where it is deemed necessary.

12.3 MEDICAL PROVIDERS AND MEDICAL TRANSPORTATION

1. The nearest medical provider to the site is Fremont Memorial Hospital, 715 South Taft Ave., Fremont, Ohio (419)334-6621.
2. The Sandusky County Emergency Medical Service can provide a level of medical care beyond that which the site is trained to provide. Also, the Sandusky County EMS has the ability to transport victims. The Sandusky County Emergency Medical Services may be contacted by dialing 911.

12.4 FREMONT MEMORIAL HOSPITAL (LOCATION)

St. Rt. 412 West to US 20 West (bypass). US 20 West exit onto Oak Harbor Road (also known as Stone Street), follow Stone Street South to hospital (will also follow signs to R.B. Hayes Presidential Library).

12.5 SITE CPR AND FIRST AID TRAINING REQUIREMENTS

1. At least one person per shift shall be trained in CPR and First Aid.
2. The training shall be a certified course by a medical agency such as the Red Cross.
3. The frequency of the training will depend on the certification.

12.6 FIRST AID EQUIPMENT

1. First aid boxes are located in the administration building, maintenance building, control room and operations lunchroom .
2. An extensive supply of first aid supplies including splints and a backboard are located in the Control Room.
3. First aid supplies are inventoried and replenished, as needed.

13.0 NEW TECHNOLOGY

The facility will review and employ new technology as a course of good management practice. Employee safety, environmental protection, process improvement, practicality and cost effectiveness are management areas which shall be incorporated into the review of new technology in order to assess the value of the technology to the operation of the site. All changes will be made in a manner appropriate with the hazardous waste permitting regulations.

APPENDIX CP-1

PROCESS-SPECIFIC PROCEDURES

OVERVIEW

This appendix provides a process-specific Contingency Plan for each of the waste storage, treatment, and disposal unit at the facility. Periodically, this appendix will be revised to reflect changes, modifications or additions to the units described. Following a short introduction for each unit, a description of the general safety and operating rules followed to prevent and be prepared for emergencies is provided. Following this, a list of response criteria is given. These criteria will be used to determine whether an emergency exists and whether response action should be implemented. Finally, the procedures that will be followed to respond to emergencies are provided.

TRUCK RECEIPT CONTROL STATION

INTRODUCTION

The Truck Receipt Control Station is located next to the main laboratory. Waste trucks enter the Vickery Facility through the Receipt Control Gate. The unit consists of receiving office within the trailer attached to the administrative office, and a large concrete pad, under roof, with lanes for three (3) tanker trucks. Two (2) of the truck positions have concrete curbs and slabs and provide containment in the event of minor spills. Further, the slabs are sloped longitudinally to a low point at the mid-length of each truck position.

Manifest and shipping papers of each waste load are checked here. The truck is inspected to ensure valves and hatches are closed and that no leaks are evident before proceeding onto interior site roads. The truck proceeds to the scale where it is weighed. The truck then proceeds to the Truck Unloading Facility.

GENERAL SAFETY AND OPERATING RULES

The truck is positioned on the slab and carefully inspected for potential leaks.

No smoking, welding, or other spark-generating activities are allowed in the vicinity of the vehicle.

RESPONSE CRITERIA

A. Fire and Explosion

- Fire, either in the truck's fuel system or engine, or in the waste tank itself.
- Explosion, in either the truck's fuel system or engine, or in the waste itself.

B. Spills or Material Releases

- Leaks or spills from the waste tank, valves or pumps.
- Truck fuel leakage.

RESPONSE PROCEDURES

A. Fires or Explosions

- Evacuate personnel from the unit and vicinity.
- Equip all response personnel with appropriate protective clothing and respiratory protection.
- Shut off valves, pumps, and electrical service, as appropriate.
- Use CO_2 and/or dry chemicals on the fire itself.
- Cool adjacent tanks, equipment and buildings with water.
- If fire is not controlled in five (5) minutes, call for outside assistance and initiate the facility evacuation plan.
- When the emergency is over, clean up the affected area, put the response equipment back in readiness, and restock emergency response supplies.
- If a tank has exploded, immediately evacuate the facility and respond to any fire as described above and/or respond to spillage of wastes as described below.

B. Spills or Material Releases

- Shut off the valves, pumps, and electrical equipment, as appropriate.
- Equip response personnel with appropriate protective gear.

- If the truck's tank itself is leaking or overflowing, remove the wastes to another tank trailer(s).
- If a valve, pipe, hose, or pump is leaking or spilling, isolate this equipment by shutting off the appropriate valves.
- Clean up the area affected by the release, repair or replace the tank or equipment, clean up and decontaminate response equipment, and restock emergency response supplies.

TRUCK UNLOADING AND SAMPLING FACILITIES

INTRODUCTION

These facilities consist of: The truck unloading and wash building, the basket strainers, the waste receiving sump tanks, the waste head gas scrubber, and an exterior bay. Sampling may occur in the interior or exterior bays. In addition, a second sampling area is located adjacent to the administration building.

The truck unloading and wash building has two (2) interior unloading bays at its east end and one (1) exterior bay. The floors of each are sloped to sumps located to one side of the bay about midway along the length of the bay. One such sump serves the two interior bays, and another serves the exterior bay. Each sump has quick-connections for hoses and one (1) working drain pipe. The hose connections lead through basket strainers then, via underground carrier pipes within protective shield pipes, to pipes in a pair of underground concrete vaults just beyond the east end of the building through piping manifolds into any of four (4) waste receiving tanks (V-tanks) that are set below grade in a nearby reinforced concrete chamber. Each of the hose connections and its corresponding basket strainer will normally be dedicated for extended periods, along with one of the waste receiving V-tanks, to receipt of a particular group of mutually compatible wastes. Problems with mixing of incompatible wastes in the truck unloading portion of the facility will thereby be avoided. The incoming wastes in the four waste receiving V-tanks will then be pumped to the various sections of the IAWTS, as determined by processing requirements based on laboratory tests.

The truck unloading bays also have an internal washing system, consisting of a spray nozzle hung from a track mounted near the

ceiling. After the truck has been unloaded, this nozzle is lowered into the truck's hatch and turned on for a set period. The wash water is drained out through the still-connected hose into waste receiving sump vessels.

The waste-head gas scrubber draws vapor, under a slight vacuum, from the head-space in the concrete vaults, the V-tanks and all of the major waste storage and treatment tanks. The duct carrying this vapor goes into the bottom of a packed scrubbing tower and is then discharged through a tall stack. A recirculating caustic solution is sprayed into the top of the scrubbing tower, removing most of the offensive gaseous components, and flows out the bottom of the tower to the holding tank for recirculation.

GENERAL SAFETY AND OPERATING RULES

The waste truck must first be positioned in the unloading bay so the tanker's discharge valve is positioned within the contained area draining to the sump. The discharge hose must then be connected to the correct quick nozzle, and to the truck discharge outlet. Each of the quick-connect nozzles for the receipt of wastes, and the units to which it leads are normally dedicated to a particular group of mutually compatible wastes. It is the responsibility of Vickery personnel to see that connection is made to the proper nozzle, that is, to one that is compatible with the waste being unloaded. During unloading, or whenever the truck's hatches are open (including the periods during internal washing), no smoking, welding, or other spark-generated activities will be permitted near the vehicle.

Operation of the basket strainers is essentially automatic, and does not need outside attention except for periodic inspection of the solids level. The operation of the waste receiving sump tanks is also largely automatic, except for manual setting of valves and of pump operation to move the liquids from the tanks into the major storage and treatment tanks of the IAWTS.

Scrubber operation is also essentially continuous and automatic, although periodic checking of scrubber solution pH and composition, blowdown, and makeup and addition of new solution is to be done manually.

RESPONSE CRITERIA

A. Fires and Explosions
   - Fire in or adjacent to the unit
   - Explosion of the unit

B. Spills or Material Releases
   - Leaks or spills from tanker trucks, tanks or appurtenant piping, valves, or pumps
   - Overflow of a tank
   - Hose, coupling, or pipe breaks during loading/unloading operation
   - Gaseous emission from a tanker truck

RESPONSE PROCEDURES

A. Fires or Explosions
   - Evacuate personnel from the unit and vicinity.
   - Equip all response personnel with appropriate protective clothing and respiratory protection.
   - Shut off valves, pumps, and electrical service, as appropriate.

- Use CO_2 and/or dry chemicals on the fire itself.
- Cool adjacent tanks, equipment and buildings with water.
- If the fire is not controlled in five (5) minutes, call for outside assistance and initiate the facility evacuation plan.
- When the emergency is over, clean up the affected area, put response equipment back in readiness, and restock emergency response supplies.
- If a unit has exploded, immediately evacuate the facility and respond to any fire as described above and/or respond to spillage of wastes as described below.

B. Spills or Material Releases

- Shut off valves, pumps and electrical equipment, as appropriate.
- Equip response personnel with appropriate protective gear.
- If a tank or tanker truck is leaking or overflowing, remove the wastes to another tank or tank trailer(s).
- If a valve, pipe, hose, or pump is leaking or spilling, isolate this equipment by shutting of appropriate valves.
- Clean up the area affected by the release, repair or replace the tank or equipment, clean up and decontaminate response equipment, and restock emergency response supplies.

PUMP HOUSES AND FILTER BUILDINGS

INTRODUCTION

The Pump Houses and Filter Buildings are one-story steel framed structures set on concrete slabs. The slabs generally have curbs all around and floor drains. The waste and other piping in the building, as well as the equipment and utilities, are usually quite complex. However, the containment system is generally adequate to contain most spills.

A variety of pump types (both centrifugal and positive displacement), materials (both corrosion-resistant metals and plastics), and sizes are used, with similarly varying packing and seal mechanisms. Some of the packing and seal mechanisms customarily leak a small amount of the pumped fluid; others require a continuous flushing with a small amount of clean water. Both such flows are contained and transferred to the waste management system. Spills are uncontrolled flows resulting from rupture of pipes or pump casings, or gross failure of the pump packing or seals. Most such spills will be caught by the curbing and drained to the local sump, but prompt action will still be required to address pipe or equipment failure.

Each of the Pump Houses have a series of cartridge filters. Each set of filters consists of a primary filter, secondary filter and by-pass filter. Each filter has the ability to hold up to 22 cartridges. These are relatively small units and if a problem develops with the primary or secondary unit, it is possible to switch the flow to the bypass unit in order to make repairs. Problems that may occur are small cracks in the filter housing or

small leaks at o-rings or seals. These types of small leaks will be caught by the curbing and drained to the local sump, but prompt action will still be required to address pipe or equipment failure.

Filter Building 1 houses the bag filter system. There are two units installed in parallel. These are relatively small units and if a problem develops with one unit, it is possible to switch the flow to the second unit in order to make repairs. Problems that may occur are small cracks in the housing or small leaks at o-rings or seals. These types of small leaks will be caught by the curbing and drained to the local sump, but prompt action will still be required to address pipe or equipment failure.

The recessed-plate filter press is a complex piece of equipment with elaborate cycles of sequential operating steps, which will not be described here. However, leakage of small amounts of waste during filter runs is normal. This occurs because the reseating of the seals between the large number of plates at the start of each filter run is frequently imperfect, but the imperfection does not become apparent until the run is partially completed. The curbing, containment and drainage system is usually adequate to handle this controlled leakage. Spill control measures are only required when the leakage is large and uncontrolled or when there is an actual rupture of piping or equipment. The machine contains a substantial amount of lubricating and other oils. Although not in themselves hazardous, leakage of these oils can cause difficulty if they get into the floor drains and are pumped into the IAWTS.

The hazard comes from possible reactions with various oxidants in certain wastes, and the simple fire hazard from floating oils.

GENERAL SAFETY AND OPERATING RULES

Pumps and filters may be either manually or automatically controlled. Periodic inspections, as detailed in the Inspection Plan, for proper performance, including the absence of excessive waste leakage or any leakage of lubricating or hydraulic oil, is the main operating rule. For manually-operated units, it is desirable to observe the unit briefly after starting (or stopping) it to see that it is functioning properly. If excessive waste leakage is observed, full protective clothing must be put on before approaching the equipment, even to turn it off, because in certain cases (such as the jamming of check valves in the open position) shutting of the equipment may not stop the flow of waste from the leak.

RESPONSE CRITERIA

A. Fire and Explosion
   - Fire in or adjacent to the pump or filter unit
   - Explosion of the unit

B. Spills or Material Releases
   - Excessive leaks or spills of waste from pumps or filters, or any leaks or spills from appurtenant piping or valves.
   - Leaks of lubricating of hydraulic oil from pumps or filters.

RESPONSE PROCEDURES

A. Fires or Explosions
   - Evacuate personnel from the unit and vicinity.
   - Equip all response personnel with appropriate protective clothing and respiratory protection.

- Shut off valves, pumps, and electrical service, as appropriate.
- Cool adjacent tanks, equipment and buildings with water.
- If the fire is not controlled in five (5) minutes, call for outside assistance and initiate the facility evacuation plan.
- When the emergency is over, clean up affected area, put response equipment back in readiness, and restock emergency response supplies.
- If a unit has exploded, immediately evacuate the facility and respond to any fire as described above and/or respond to spillage of wastes as described below.

B. Spills or Material Releases

- Shut off valves, pumps, and electrical equipment, as appropriate. Equip response personnel with appropriate protective gear. If a pump, filter, valve, or pipe is leaking or spilling waste, isolate this equipment by shutting off appropriate valves. Clean up area affected by the release, repair or replace the tank or equipment, clean up and decontaminate response equipment, and restock emergency response supplies.

FILTERED ACID TANKS (FAT) AND WELL HEADS

INTRODUCTION

The FAT tanks are surge tanks that are usually situated close to the deepwells that they serve. Also close by are Pump Houses Nos. 1, 2, 3, and 5, which serve the various deepwells, and which have been discussed earlier herein. Except for their isolated locations, the FAT tanks are similar to the major IAWTS tanks, as are their hazards, operating rules and safety precautions; thus the FAT tanks can be handled according to the procedures in the section "Major Storage and Treatment Tanks."

The well heads consist of a series of pipes connecting to both the inner casing of the well. The inner pipe conveys the waste into the injection tubing. The outer pipe is the annular space between the inner and outer casings, which contains an inert, immiscible, stationary fluid such as diesel oil. The injection tubing is pressurized to about 750 psi, whereas the outer is pressurized to about 1,000 psi. The annulus liquid is pressurized by inert gas (such as nitrogen), from a cylinder of compressed gas, and the interface level between the gas and the liquid is observable in a sight glass. Should a leak develop in either the injection tubing, or the outer casing, the automatic well monitoring system will shut down the well.

GENERAL SAFETY AND OPERATING RULES

As most of the equipment and valves on the well head are automatic, the periodic inspections described in the Inspection Plan, along

with the automatic alarms, should be adequate to discover any leaks, spills, or other hazardous conditions requiring attention.

RESPONSE CRITERIA

A. Fire and Explosion
   - Fire in or adjacent to the well head unit
   - Explosion at well head

B. Spills or Material Releases
   - Leaks or spills of wastes from the well head or appurtenant piping or valves
   - Leaks or spills of annulus filler liquid from piping or valves

RESPONSE PROCEDURES

A. Fires and Explosions
   - Evacuate personnel from the unit and vicinity
   - Equip all response personnel with appropriate protective clothing and respiratory protection.
   - Shut off valves, pumps, and electrical service as appropriate.
   - Use CO2 and/or dry chemicals on the fire itself.
   - Cool adjacent tanks, equipment and buildings with water.
   - If the fire is not controlled in five (5) minutes, call for outside assistance and initiate the facility evacuation plan.
   - When the emergency is over, cleanup the affected area, put response equipment back in readiness, and restock emergency response supplies.
   - If a well head has exploded, immediately evacuate the facility and respond to any fire as described above and/or respond to spillage of wastes as described below.

B. Spills or Material Releases

- Shut off valves, pumps, and electrical equipment, as appropriate.
- Equip response personnel with appropriate protective gear.
- If a valve or pipe is leaking or spilling waste, isolate this equipment by shutting off the appropriate valves.
- Clean up the area affected by the release, repair or replace the leaking pipe, clean up and decontaminate response equipment, and restock emergency response supplies.

MAJOR STORAGE AND TREATMENT TANKS

INTRODUCTION

The Integrated Aqueous Waste Treatment System (IAWTS) is composed of four parts: Major storage and treatment tanks, pumps and pump houses, filters and filter buildings, and yard piping. This section covers the first part; the other parts have been covered in previous sections.

Bulk liquid wastes are stored and treated in large tanks during processing. Total tank capacity at the facility for both storage and treatment is approximately 1,200,000 gallons.

GENERAL SAFETY AND OPERATING RULES

No incompatible waste or materials are stored in the same tank. No corrosive wastes are stored in tanks that are not specifically designed for these wastes.

All tanks are equipped with pressure and vacuum relief valves as necessary. All tanks are equipped with level-of-liquid indicators and high-level alarms, and all loading operations are performed with foreknowledge of the unfilled capacity of the tank and the quantity of the waste or material to be loaded into the tank.

All valve open/close settings are checked before waste or material transfer into or out of any tank is initiated.

All tanks are located in secondary containment systems designed to hold the capacity of the largest tank plus the rainfall from a 25

year, 24-hour storm event. Any liquids in these secondary containment system units are drained to a sump and pumped into the IAWTS for treatment and subsequent disposal in the deep wells.

No smoking, welding, or other spark-generating activities are allowed at or near tank storage units without a permit.

All tanks are equipped with caged safety ladders or railed catwalks, as appropriate, to ensure personnel safety.

The Inspection Plan has been implemented to assure observance of the above procedures, to detect leaks or spills, and to achieve annual testing of tanks.

Responses to leaks or spills from tank systems are addressed in accordance with the requirements of OAC 3745-55-96.

RESPONSE CRITERIA

A. Fire and Explosion
   - Fire in or adjacent to the tank storage unit
   - Tank Explosion

B. Spills or Material Releases
   - Leaks or spills from tanks or appurtenant piping, valves, or pumps
   - Overflow of a tank
   - Pipe breaks during transfer of liquid into or out of a tank
   - Gaseous emissions from a tank (from the pressure-relief valve or otherwise)

RESPONSE PROCEDURES

A. Fire or Explosions
   - Evacuate personnel from the unit and vicinity.

- Equip all response personnel with appropriate protective clothing and self-contained breathing apparatus.
- Shut off valves, pumps, and electrical service, as appropriate.
- Use CO_2 and/or dry chemicals on the fire itself.
- Cool adjacent tanks, equipment, and buildings with water.
- If fire is not controlled in 5 minutes, call for outside assistance and initiate facility evacuation plan.
- When emergency is over, clean up affected area, put response equipment back in readiness, and restock emergency response supplies.
- If a tank has exploded, immediately evacuate the facility and respond to any fire as described above and/or respond to spillage of waste as described below.

B. Spills or material Releases

- Shut off valves, pumps and electrical equipment, as appropriate.
- Equip response personnel with appropriate protective gear.
- If the tank itself is leaking or overflowing, remove the wastes to another tank or tank trailer(s).
- If a valve, pipe, or pump is leaking or spilling, isolate this equipment by shutting off appropriate valves.
- Clean up area affected by the release, repair or replace the tank or equipment, clean up and decontaminate response equipment, and restock emergency response supplies.

APPENDIX CP-2
BOMB THREAT CALL CHECKLIST

1. Where is the bomb? _____
2. When will it go off? _____
3. What does it look like? _____
4. Did you place the bomb? If so why? If not, how does he/she know about it? _____

   _____
5. What is your name/organization? _____

****

Fill out the following information immediately after the caller hangs up:

1. Your name: _____
2. Date: _____/_____/_____ Time: _____:_____ am pm
3. Call received on extension #: _____
4. Call lasted approximately _____ minutes.
5. Did you recognize the caller's voice? (Y or N) _____
6. Did the description of the bomb location or anything else indicate that the caller was familiar with the premises?

   _____
7. Caller's sex: MALE FEMALE
8. Caller's voice and manner (Circle all descriptions that apply):

   SPEECH: fast slow distinct stuttering nasal lisp distorted/slurred high hoarse

   Other: _____

Language: Educated-sounding Uneducated-sounding Foul or Profane

Other: _____

Dialect: Did caller seem to speak in a foreign accent or regional American dialect?

If so can you describe? _____

Manner: Calm Angry Rational Irrational Coherent Incoherent Deliberate Emotional Righteous Businesslike Shouting Ill at Ease Laughing

Other: _____

9. Did you hear background noise that might suggest where the caller was? Conversations Street Traffic Airplanes Trains Party Animals Crowd Office Machines Factory Machines School bell Music Public Address System

Other: _____

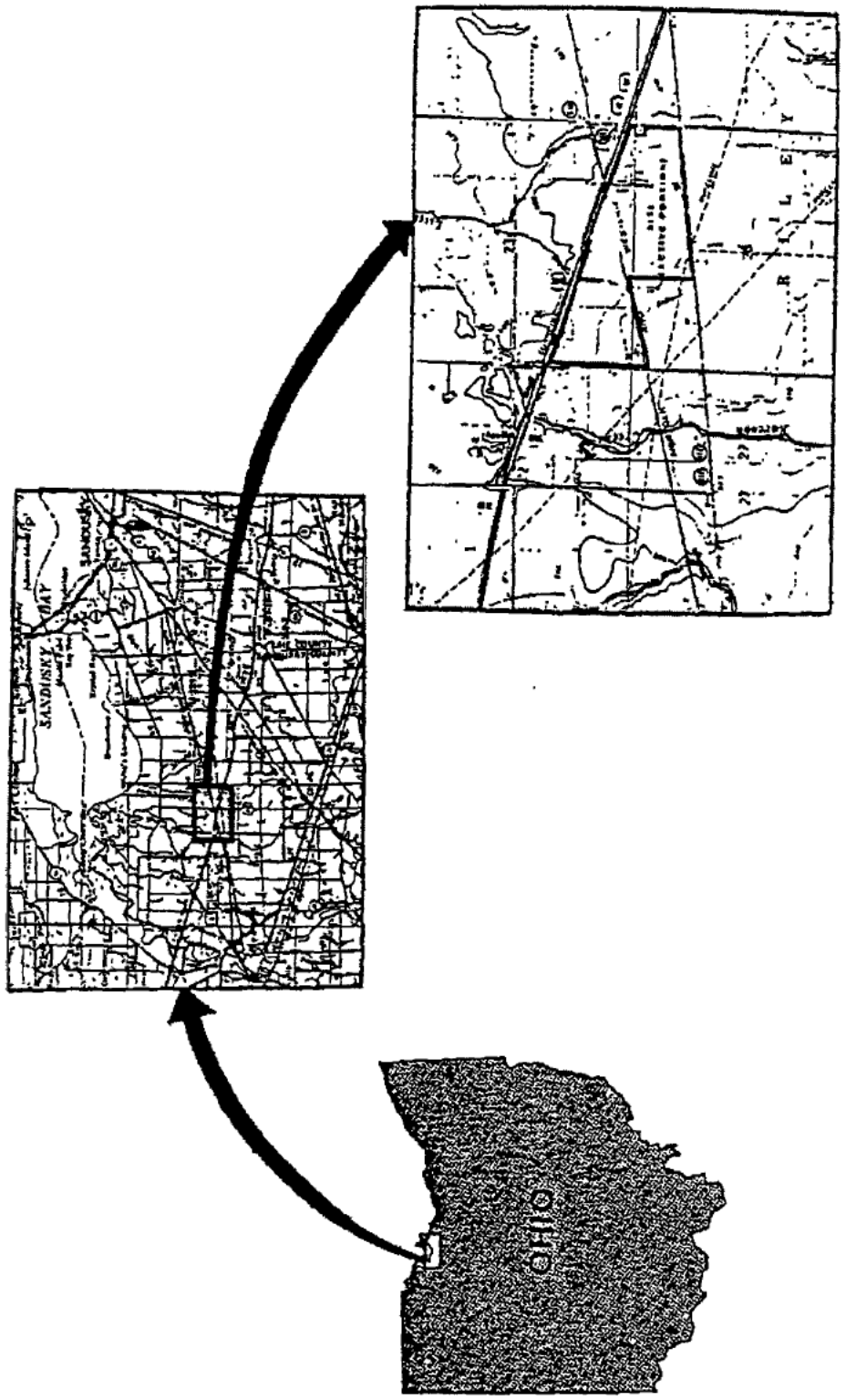
10. Additional comments:

_____

_____

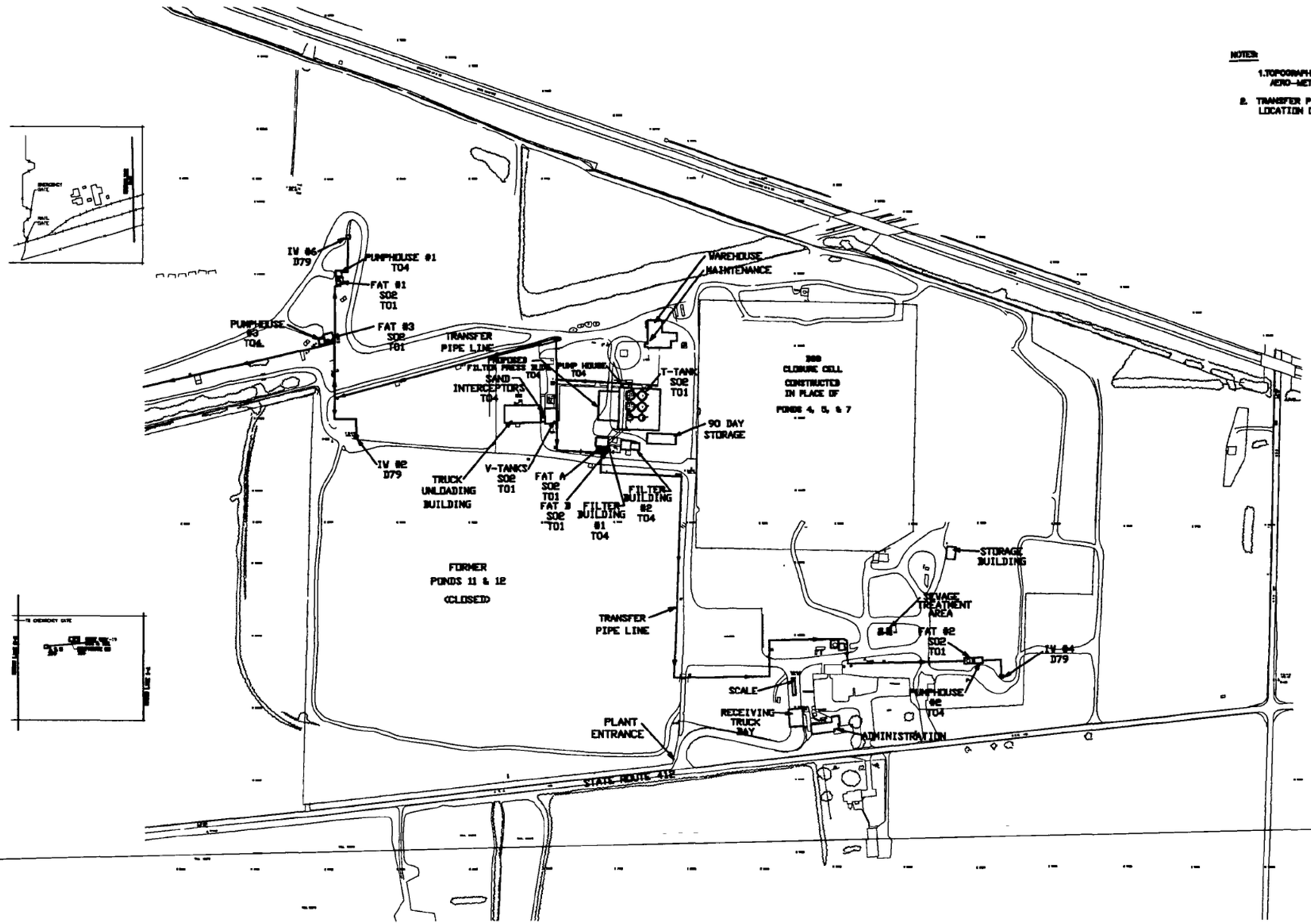
_____.

FIGURE 1-1 SITE LOCATION



NOTES:

1. TOPOGRAPHIC INFORMATION SUPPLIED BY AERO-METRIC ENGINEERING, INC. FLOWN 1/93.
2. TRANSFER PIPE LINE SHOWN AS GENERAL LOCATION ONLY.



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KUSMER & ASSOCIATES, INC.
ARCHITECTS · ENGINEERS · SURVEYORS
622 WEST STATE FREMONT, OHIO 43420 PHONE 419-332-1027

VICKERY FACILITY

RILEY TOWNSHIP, SANDUSKY COUNTY, OHIO

NO	DATE	BY	REVISION	CHECK

DRAWN E. HASLAM 1-18-95 13:57 on EST

NORTH

0 200
SCALE: 1" = 200'

FIG. 1-2

98167S

LAYOUT OF EXISTING FACILITY

FIGURE 2-1
RESPONSE ACTIVITIES
VICKERY FACILITY

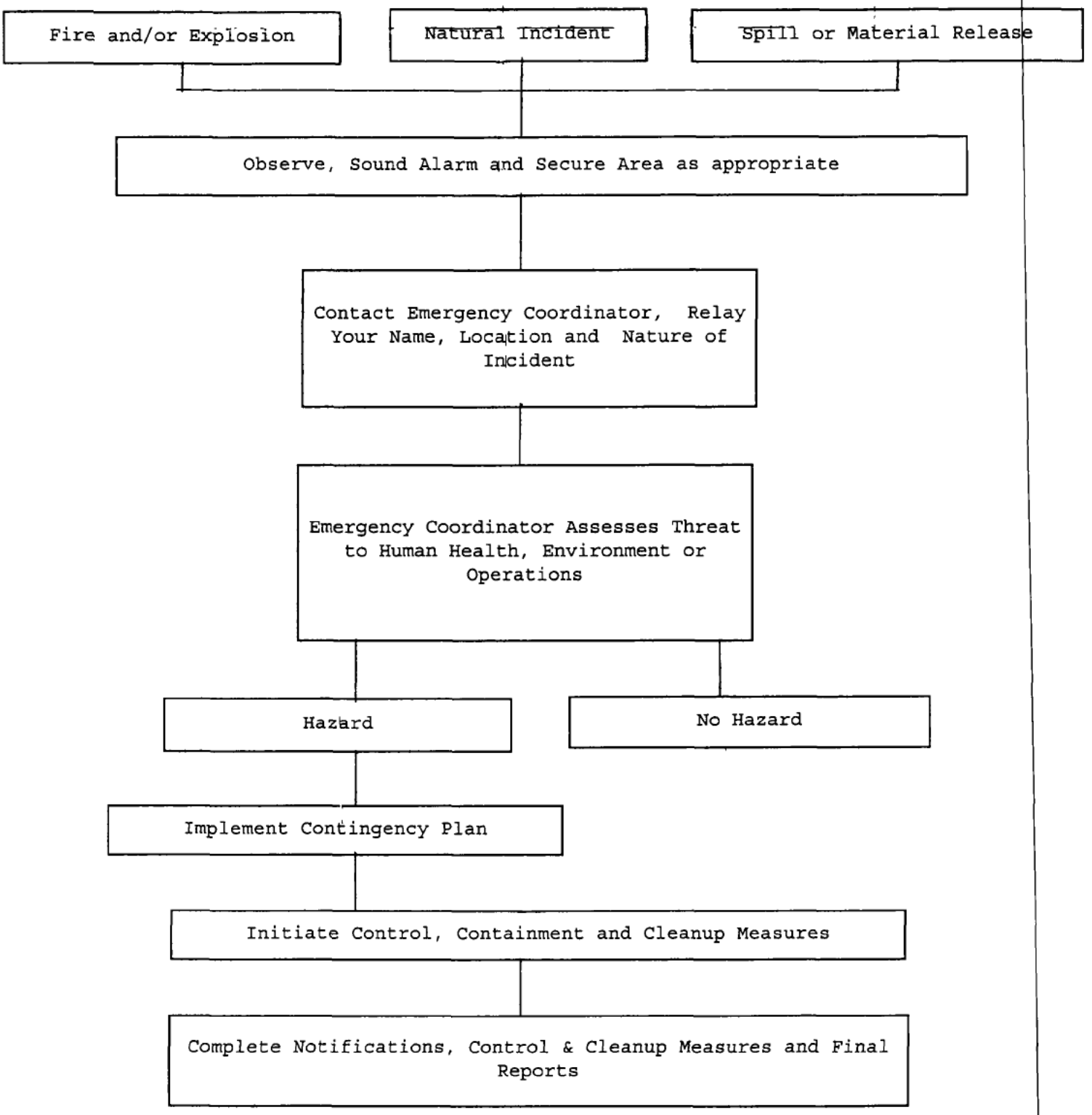


FIGURE 3-1

EMERGENCY COORDINATOR DESIGNATION CERTIFICATE

SECRETARY'S CERTIFICATE

WASTE MANAGEMENT OF OHIO, INC.

1, Bryan J. Blankfield, do hereby certify that I am the duly elected, qualified and acting Secretary of Waste Management of Ohio, Inc., a Delaware corporation (the "Corporation") and that the following resolutions are true, corect and complete copies of resolutions duly adopted by the Board of Directors of the Corporation on September 28, 1999 and that such resolutions have not been amended, modified or rescinded and are in full force and effect as of the date hereof:

Resolved, that the Corporation hereby grants to the individual(s) designated as "Emergency Coordinator" in the approved Contingency Plan for the Vickery Facility located in Vickery, Ohio, to commit such of the Corporation's resources as are needed to carry out such Contingency Plan; and

Be It Further Resolved, that such individual(s) designated as "Emergency Coordinator" in such approved Contingency Plan be and hereby are authorized, directed, and empowered to execute and deliver for and on behalf of the Corporation any and all such contracts, agreements, documents and memoranda to be necessary and appropriate to execute the herein authorized resolution.

Bryan J. Blankfield
Secretary

Dated: September 28, 1999

FIGURE 3-1 A

LINES OF AUTHORITY FOR A VICKERY ON-SITE EMERGENCY RESPONSE

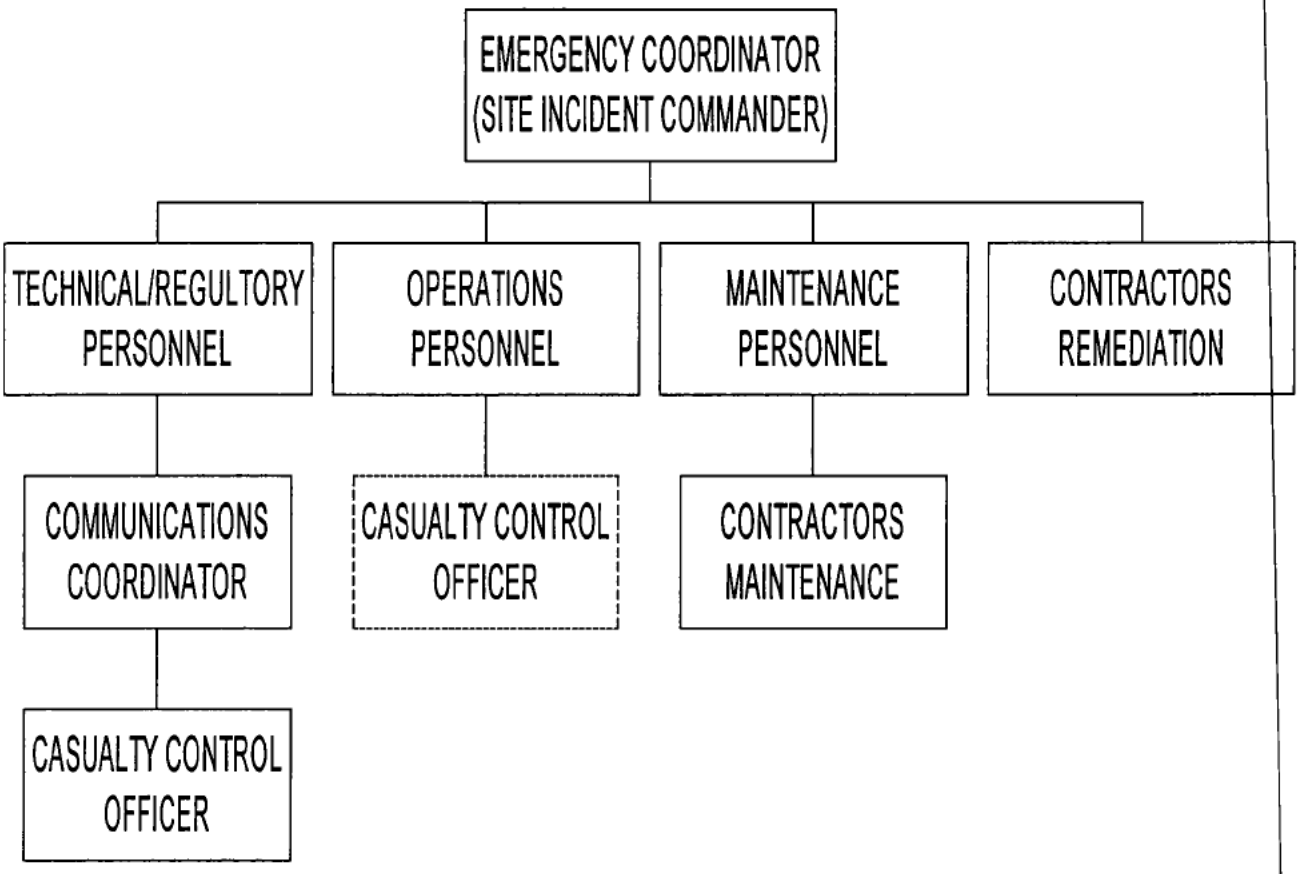


FIGURE 3-1 B

LINES OF AUTHORITY FOR A VICKERY ON-SITE EMERGENCY RESPONSE REQUIRING ASSISTANCE FROM A GOVERNMENTAL JURISDICTION

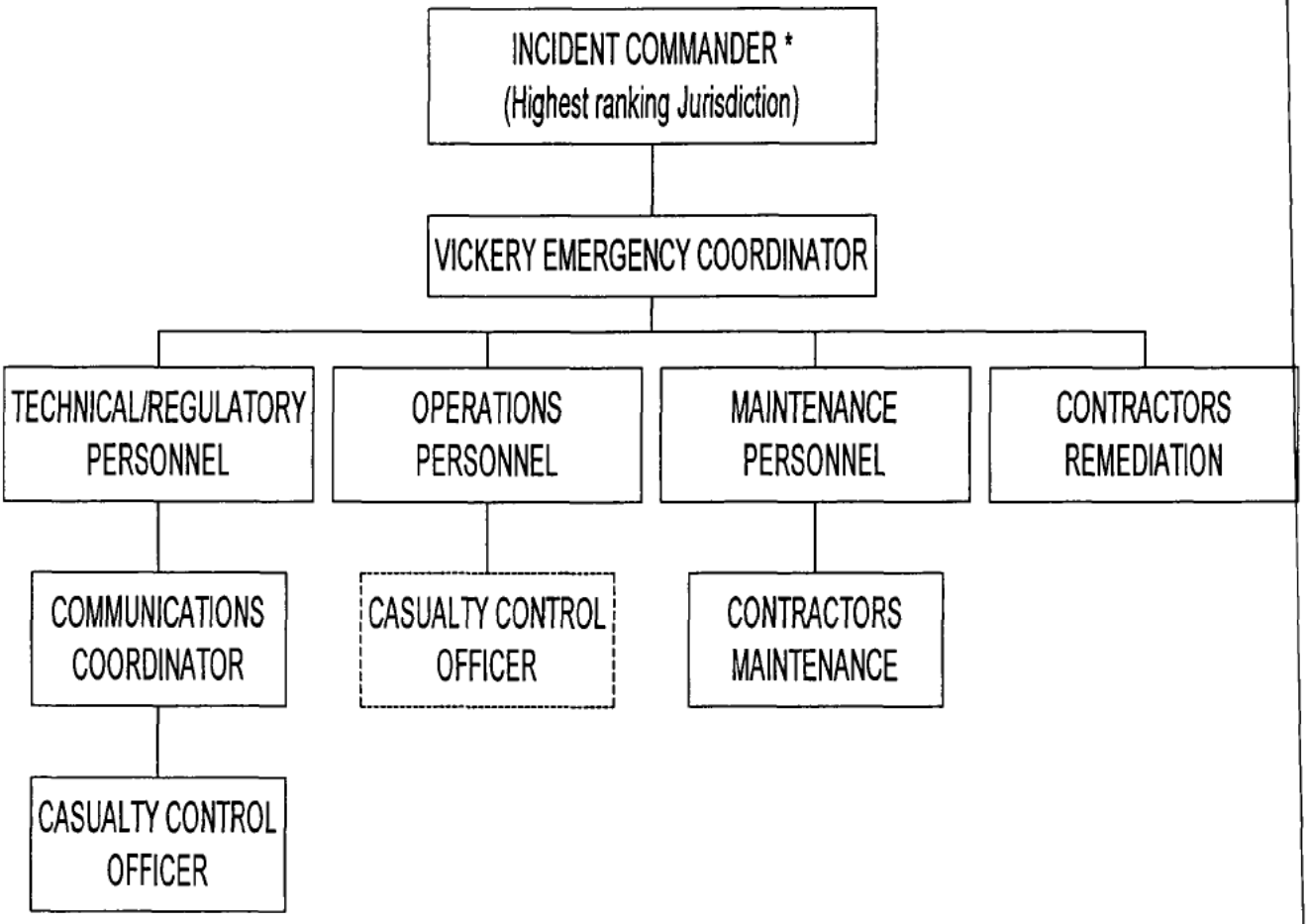
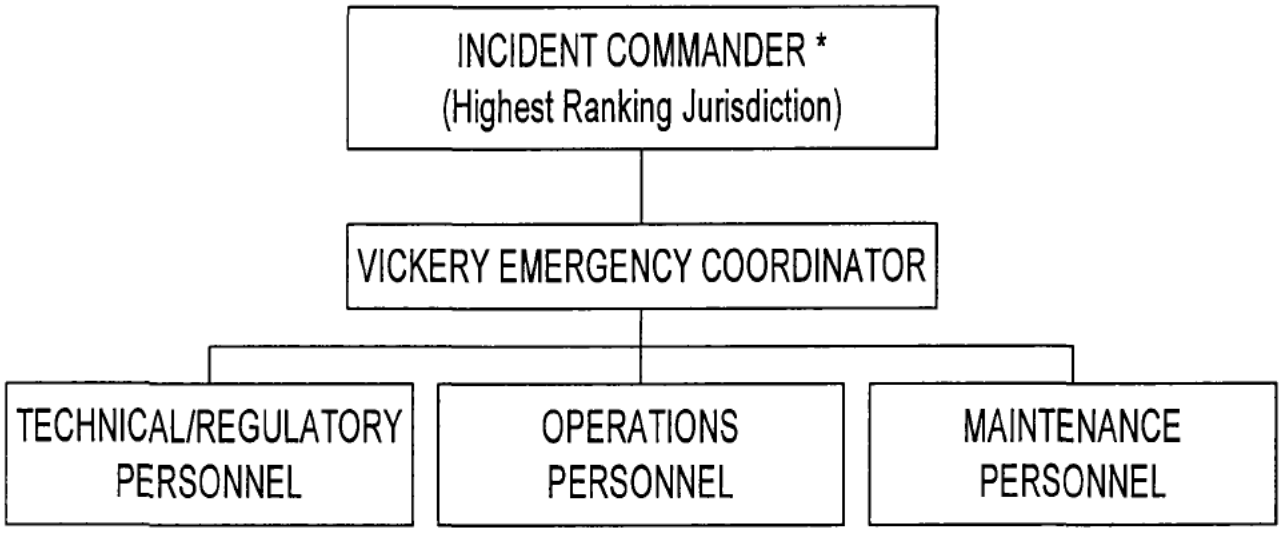
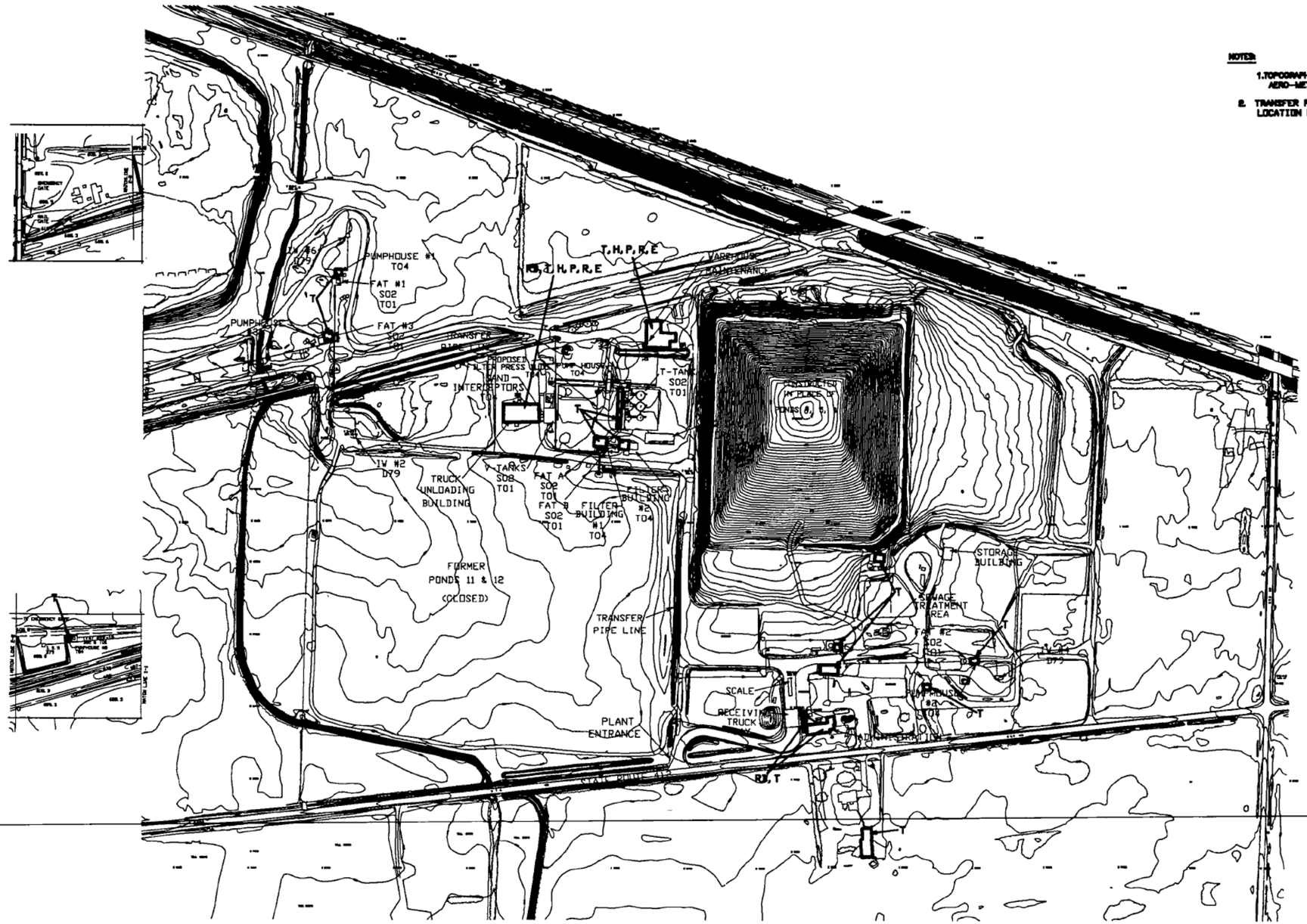


FIGURE 3-1 C

LINES OF AUTHORITY FOR A VICKERY OFF-SITE EMERGENCY RESPONSE AT THE REQUEST FROM A GOVERNMENTAL JURISDICTION



* NOTE: The Incident Commander for Emergency Responses depicted in Figures 3-1 B and 3-1 C will be the Highest Ranking Official having jurisdiction for a hazardous waste spill. Normally, the local Fire Department Chief will assume the role of Incident Commander. In the absence of the Fire Chief, the Coast Guard, EPA, Ohio State Patrol and the Sheriff Department (listed here in descending order of jurisdiction) will assume control of the incident until a person of a higher jurisdiction assumes the role of Incident Commander.



NOTES:

1. TOPOGRAPHIC INFORMATION SUPPLIED BY AERO-METRIC ENGINEERING, INC. FLOWN 1/93.
2. TRANSFER PIPE LINE SHOWN AS GENERAL LOCATION ONLY.

RADIO BASE UNIT	RB
TELEPHONE	T
HEAVY EQUIPMENT	H
PERSONAL PROTECTION EQUIPMENT	P
RESPIRATION EQUIPMENT	R
EMERGENCY RESPONCE EQUIPMENT	E

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VICKERY FACILITY

RILEY TOWNSHIP, SANDUSKY COUNTY, OHIO

NO	DATE	BY	REVISION

DRAWN E. INGLE CHECK

98167S-1.dwg 1-13-99 12:07:59 am EST

NORTH

SCALE: 1" = 200'

FIG. 4-1

98167S

COMMUNICATION EQUIPMENT LOCATION

8/17/01

IT Corporation
16406 U.S. Route 224E
Findlay, OH 45840-9761
Tel. 419.423.3526
Fax. 419.424.4997
A Member of The IT Group

FIGURE 4-2

September 10, 1999

Sandra Clark
Waste Management of Ohio
3956 State Route 412
Vickery, OH 43464

Dear Ms. Clark:

RE: IT Corporation's Specialty Services and Emergency Response Program Statement of Qualifications and Emergency Services Agreement

Thank you for your continued interest in IT Corporation. The merger in 1998 between International Technology Corporation, a 70-year stalwart in the consulting, engineering, and construction services arena and OHM Corporation, a 30-year leading provider of emergency response and hazardous waste remediation services was just one of many that has been undertaken by The IT Group, Inc. to position IT Corporation (IT) as a full service provider of environmental services.

The SSER Program is only one part of IT's diversified remediation services product line. IT has strategically placed dedicated emergency response resources in 14 of over 90 available IT office locations. Extremely critical and unique high hazard/compressed gas rail and truck transfer trailers are located in five of those 14 response locations. The response centers are staffed with full-time SSER personnel and equipment that allows for immediate response and the oversight of a comprehensive subcontractor network.

Our network members have been carefully selected, profiled, and subcontracted based on a safety performance criteria and size within a geographical region. Each member has agreed to pre-placed negotiated rates, performance monitoring, and special terms and conditions. Most network member companies have multiple locations and have been in business for over 10 years. This network allows IT's SSER Program to provide national coverage out of I 10 response centers located in 3 8 states. To activate this powerful and comprehensive emergency response network, a client only has to use IT's **one-call system, anytime** of the day, 365 days a yea **r-- 1 -800-537-9540.** Response times to the majority of all major U.S. cities are on an average of four hours or less.

Having a pre-established contract with IT's SSER Program, clients are ensured consistent, quality services, timely response services, and a one rate schedule on a coast-to-coast basis. Two original Emergency Services Agreements are enclosed for your review and signature. Please fill in the blanks of the agreement with Waste Management of Ohio's specific information and return both to Rob Weber at 16406 U.S. Route 224 East, Findlay, OH 45840. A fully executable contract will be returned to you for your files. In the interim, IT Corporation is available to respond to emergency incidents at your Vickery, Ohio, facility.

IT looks forward to our working relationship with Waste Management of Ohio. If you wish to inquire about other services IT offers or have further questions regarding the SSER Program, please contact us. Questions regarding contract language may be directed to Mr. Mark Harland 770-475-8994.

Respectfully Submitted,
W. R. Thompson
SSER Program Director
770-663-1454

Respectfully Submitted,
Rob Weber
SSER Program Manager
419-425-6097

Enclosure: SSERSOQIESAI]997 Price List

8/17/01

FIGURE 4-2A

PHILIP SERVICES

INDUSTRIAL SERVICES GROUP

Cousins Waste Control Corp.

Sandra Clark
Waste Management of Ohio
3956 State Route 412
Vickery, Ohio 43464

RE: Emergency response agreement

Dear Ms Clark,

Thank you for your interest in Cousins Waste Control Corp. a division of Philip Services Corp. We appreciate the opportunity to be of service to Waste Management. Please let this letter serve as notice that should Waste Management, Vickery facility require our assistance with an emergency situation Cousins will respond with the necessary equipment and labor. All personnel are 40 hour OSHA trained and have safety as the number one priority. The emergency response supervisors have the knowledge and experience to handle most incidents effectively and efficiently.

Again thank you for your continued support. If Waste Management would require our services please have your people call 1-800-433-6754 24 hours per day, 7 days per week. They should be able to tell our staff the amount of material released, name of material released, are storms or water ways affected and is the material contained. This information is helpful when preparing to mob to your site.

If you should have any questions please contact me at 1-800-433-6754.

Rick Stine
Operations Service Manager

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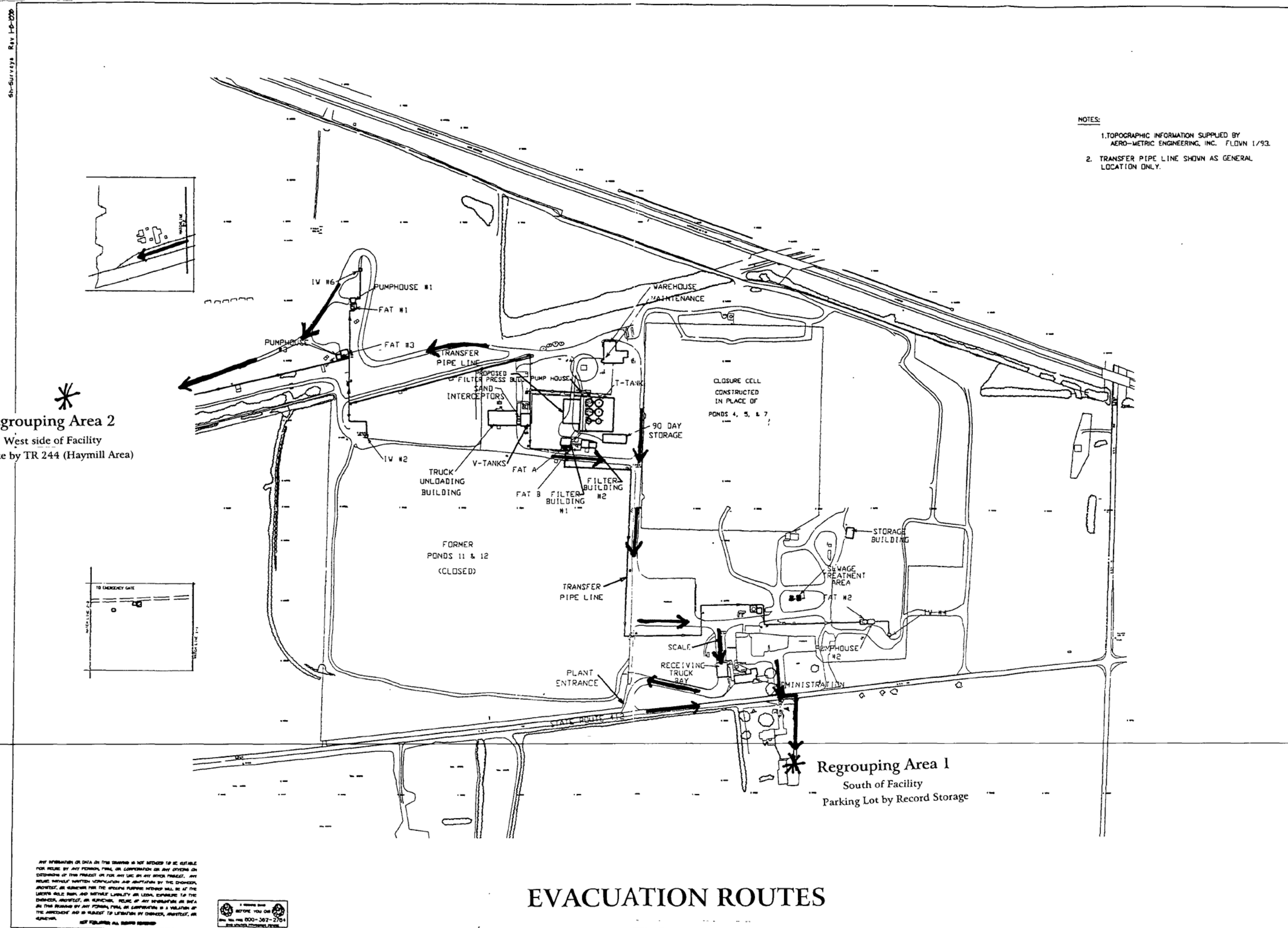
1701 E. MATZINGER ROAD, TOLEDO, OH 43612, (419) 726-1500 (419) 729-8501



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VICKERY FACILITY
RILEY TOWNSHIP, SANDUSKY COUNTY, OHIO

DRAWN E. MAGLE | CHECK
No | DATE | BY | REVISION

NORTH
ASSUMED
0 200
SCALE 1" = 200'

FIG. 6-1
98167S

EVACUATION ROUTES

1.4.1 Emergencies Inherent to Facility Operations

Potential emergencies which could result from facility operations and the types of materials processed for disposal include:

- Fire[1]
  - Could cause the release of toxic/caustic fumes.
  - Could spread and possibly ignite materials at other locations on site, or cause heat-induced explosions.
  - May produce contaminated run-off from fighting fire with water or chemical fire suppressant.
- Explosion
  - Could cause a safety hazard from flying fragments or shock waves.
  - Could ignite other hazardous waste at the facility.
  - Could result in release of toxic/caustic material.
- Spills or Material Releases
  - Could result in release of flammable liquids or vapors capable of causing a fire or gas explosion hazards.
  - Could cause the release of toxic/caustic liquids or fumes.
  - Could result in contamination of off-site surface water.
- Accident (vehicle or equipment)
  - Could cause a fire, explosion or spill, as described above.
  - Could result in mixing of incompatible chemicals.
  - Could cause surface contamination through release of toxic/caustic liquids.

[1]The site Fire Prevention Program and Pre-Plan will serve as guidance to personnel performing fire related activities.

- Could cause air contamination through release of fumes.

o Injury\Illness

- Could require the administration of first aid\CPR by site personnel or outside medical help.

1.4.2 Natural Events

There are potential facility emergencies which could result from "Acts of God", including major climatological, geophysical, or other natural events such as:

1.4.2.1 Heavy rainstorms, including lightning strikes and hail.

1. Policy

The policy of this facility is to act conservatively and to have all employees seek cover during a thunderstorm if there is a threat of a lightning strike to an employee or equipment. The shift supervisor's are responsible for protecting their employees from the threat of lightning strike. All supervisors have the authority to have their employees temporarily cease operations and seek cover inside if local atmospheric conditions are threatening. Before the operating employees seek cover they may need to secure their areas. This means they may need to shut off all pumps, close valves and secure any trucks or open containers they are working on at the time of the storm.

2. Notification

Notification that a storm is impending may be made to either the EC, the Operations Manager, or the Shift Supervisor, by any employee monitoring a local radio station. Additional clues that a severe storm may be impending may be rapidly darkening skies, the sound of thunder in the distance, sudden downpours, etc.

3. Preparatory Actions

Since thunderstorms develop quickly and their severity is very unpredictable, it is note worthy that work activities in open areas and elevated locations may cease when thunderstorms or other adverse weather conditions threaten.

IF LIGHTNING SHOULD STRIKE ANYWHERE IN THE PROCESS AREA AND START GREATER THAN AN INCIPIENT STAGE FIRE, THE FIRE DEPARTMENT WILL BE CALLED.

4. Post Incident Actions

Supervisors are to account for all employees. Once complete, an inspection of the facility should be undertaken to ensure that no damage was suffered. If damage is noted, the EC must be notified.

All electrical equipment involved in the incident must be inspected prior to restarting operations.

1.4.2.2 Tornados

1. Policy

In the event of a tornado sighting priority will be given to notify personnel. Personnel will be directed to areas of refuge or to the most structurally sound areas of the closest site building.

2. Notifications

Notification will be made by the person sighting the tornado from a place of refuge. The person shall issue a general warning to all personnel by dialing 70 and saying something similar to **"Tornado sighted, take cover immediately, I repeat, tornado sighted, take cover immediately."** He will then call specific extensions (322 Control Room, 0 - Operator) near the refuge areas

to make sure the general warning was heard and people are responding to it. The person will then dial 911 and notify the community emergency response personnel of the sighting.

Areas of Refuge

a.) Administration Building Basement
b.) Employee Lunch Room (Operations) Interior Hallway
c.) Receiving Building 1st floor Restroom

3. Preparatory Actions

Tornado Watch or Tornado Warning If a tornado watch or warning is issued by the National Weather Service the EC shall be notified. The EC shall keep updated on the weather by using local media as a resource and by keeping watch on the sky in immediate area (e.g. WFRO FM 99.1 or AM 900). The EC shall make sure all personnel are notified of the warnings issued by the National Weather Service. The EC has the authority to order facility personnel to shut-down the facility.

4. Post Incident Actions

Supervisors are to account for all employees. If safe to do so, an inspection of the facility should be undertaken to ensure that no damage was suffered. If damage is noted, the EC must be notified.

Notifications must be made to the Region office as soon as possible.

1.4.2.3 Severe cold and snowstorms

1. Policy

The facility has potential to experience problems from cold weather and/or snow. The periods of the severe weather are usually limited to no more than a week at a time. These breaks in the weather generally allow the facility to recover from the freezing problems created by the extreme cold.

The types of problems that the facility may experience are frozen pipes, ice on walking areas, accumulation of ice in containment areas, frozen valves and cold stress experienced by the employees.

2. Notification

No specific notification needed. The Operations Manager shall notify all supervisors that cold weather is expected, who in turn shall notify the appropriate facility personnel. Facility personnel should be reminded of the dangers of cold stress.

Supervisors and operating personnel need to take precautions to prevent problems from the cold weather. Supervisors will need to check on their employees and make sure they are properly dressed for the weather. The operating personnel will have to prepare for cold weather by having additional clothing available during extremely cold periods.

3. Preparatory Actions

The facility's response to cold weather must be pro-active. Maintenance or contractor personnel will remove snow and ice from key roads, sidewalks and parking lots as soon as they can. Salt may be applied liberally to melt residual snow and ice and to provide better traction.

Operations personnel will be responsible for the active areas of the facility. The two biggest concerns are freezing pipes and

slipping hazards caused by the ice and snow. Operations shall be proactive. Operations personnel are to make visual inspections of the active areas to detect and remediate discovered problems. Ice and snow are to be removed as quickly as possible to reduce the chance of someone slipping and hurting themselves. Personnel can use materials such as salt and sand to increase traction. As ice and snow melt in containment areas it must be pumped up to a storage tank.

Extreme cold might require that additional breaks be given to personnel to allow them to come inside and warm-up. All personnel should be aware of the dangers of coming in to a warm-up and starting to sweat. If sweating occurs the employee could experience accelerated hypothermia due to the moisture near his skin. Therefore, all employees should consider changing clothing before returning to the cold environment to reduce the increased chance of hypothermia due to the wet clothes. It is important that this change of clothing include the socks since the feet are one of the most susceptible areas of the body to the effects of cold weather.

4. Post Incident Actions

All melted snow or ice must be cleaned up as soon as possible to prevent further freezing during another cold event. All pipes, flanges, valves, etc. should be visually inspected to prevent releases or spills due to weather-caused cracks or splits in these pieces of equipment.

1.4.2.4 Earthquake

1. Policy

The site is not located on a seismic fault and is not considered to be any more prone to an earthquake than any other

area. Response activities after the occurrence will be similar to any other emergency incident.

2. Notification

No prior notification will be possible.

3. Preparatory Actions

Due to the nature of an earthquake, no prior preparatory actions are possible.

4. Post Incident Actions

Supervisors are to account for all employees. If safe to do so, an inspection of the facility should be undertaken to ensure that no damage was suffered. If damage is noted, the EC must be notified.

1.4.2.5 Flood

1. Policy

The site is not located in a flood plain. Therefore, the facility does not expect to be flooded due to rising waters from local rivers and streams.

2. Notification

None needed.

3. Preparatory Actions

If a flood is imminent, the facility shall attempt to obtain sand bags to utilize as a dam. If this is not possible, the yard tractor may be utilized to build earthen dams.

All paperwork considered vital shall be removed to an area of higher, dry ground or a secure off-site location which will remain dry.

If the water level appears to be rising and rises over any dams, all of the operating units shall be shut down. All of the boilers on the site shall be shut down. All tank valves shall be closed. Electrical supply shall be eliminated where possible. All equipment stored or placed on the floor shall be moved onto table tops when possible. Attempt to remove any vital paperwork to areas which may remain dry.

4. Post Incident Actions

Being cautious of water/electricity hazards, the facility shall be inspected in order to ensure that water damage will not adversely affect start-up of the facility.

1.4.3 BOMB THREATS

a.) Any bomb threats received by the site shall be referred to the EC if possible.

b.) All individuals communicating with the caller shall utilize the Bomb Threat Call Checklist located in Appendix CP-2.

c.) It is critical in the event of a bomb threat that the person receiving the call be calm and courteous. The receiver needs to try to keep the caller on the line as long as possible. By pretending to have difficulty hearing it is possible to keep them on the line longer.

d.) After the receiver has completed the above information they are to immediately contact the General Manager or his

designee, the Operations Manager and the Security Manager. These people will get together and coordinate the facility's response to the bomb threat.

Items that need to be done by the one of the above three people:

1. Call Sandusky County Sheriff's Department at 911 or 332-2613.
2. Determine whether site needs to be evacuated.

2.0 IMPLEMENTATION OF EMERGENCY RESPONSE PROCEDURES

In the event of an emergency which results in fire, explosion or accidental materials release, emergency response activities will be initiated accordingly, following discovery of the event. An assessment of the situation will be performed immediately by the person discovering the incident. A logic diagram of emergency response activities is shown in Figure 2-1. In the event of an imminent or actual emergency, the person discovering the incident will implement the following procedures:

1. Notify the EC and secure the area. The EC can be directly notified by phone on site or at home, or by pager.

2. The EC is responsible for all emergency response actions. The first step for the EC is to make a preliminary assessment of the situation based on visual observation, verbal communication, or any available data. The emergency will be evaluated using the following criteria and the criteria outlined in Section 1.4.1.

If the event can be controlled and contained on-site **and**, if the event presents no potential hazard to human health, or the environment, the EC will proceed with emergency response procedures detailed herein without activating the Contingency Plan. Post-

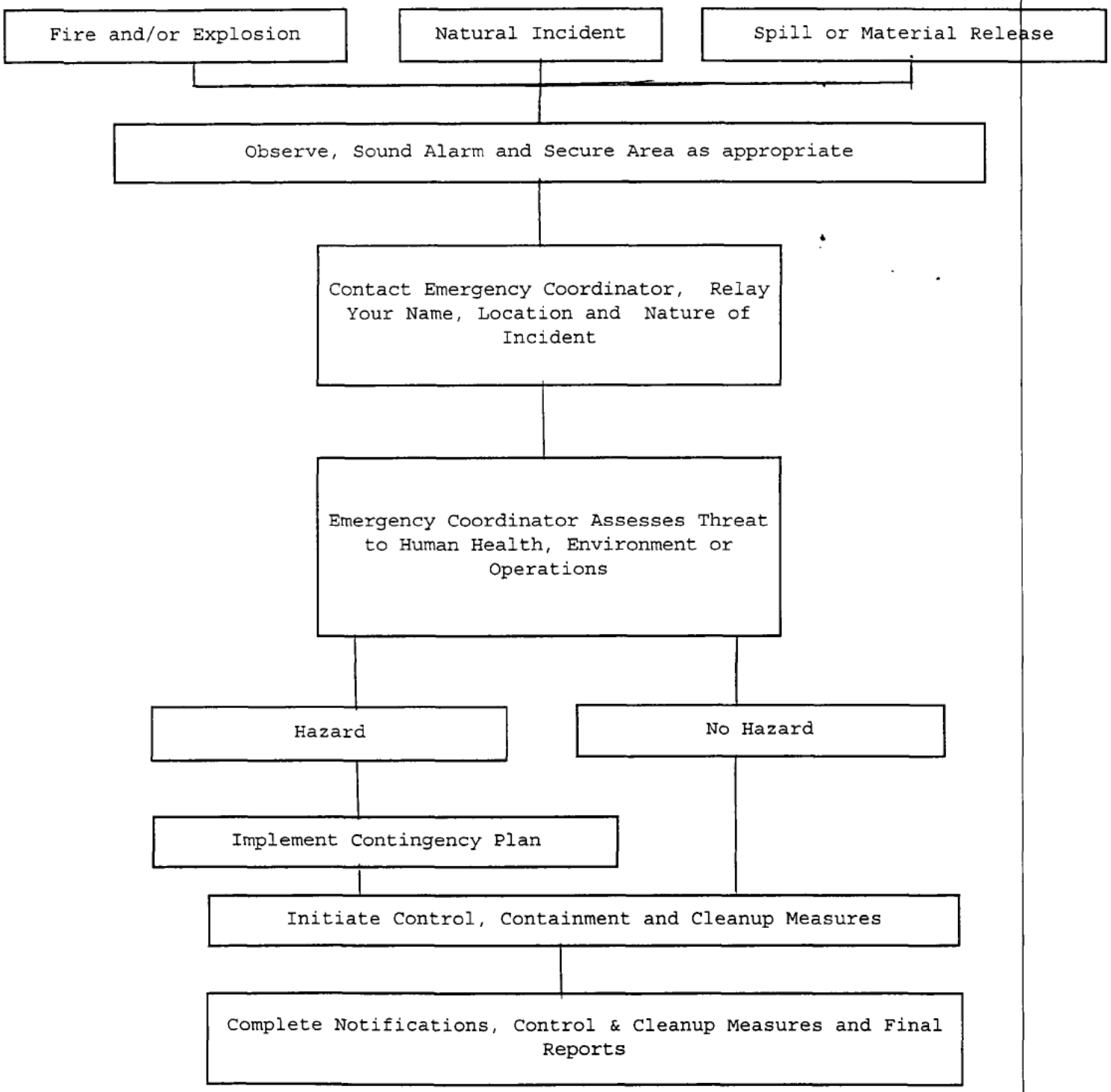
emergency (cleanup) procedures will be implemented and the necessary reporting will be completed.

If the event poses a threat to off-site human health, or the off-site environment, the EC will contact the appropriate "emergency response" agency(ies) thereby implementing the Contingency Plan. (See Emergency Contact List Table 2-3).

3. Invoking the Contingency Plan

The Contingency Plan will be enacted whenever the EC determines that there is a threat to human health or the environment. Since Vickery employees are trained to handle spills, have personnel protective equipment to work in hazardous environments, the potential for threat to human health to employees on site is controllable. The EC will evaluate the incident's potential to threaten human health if a release has the potential to leave the site line. For potential threat to the environment, the EC will assess the incident based on the potential of the release to leave the property or if outside assistance is needed to remediate the release. Since a large portion of the materials that the Vickery facility handles are aqueous streams, the greatest potential for a threat to the environment involves a release that would threaten the waterways. The soil for the Vickery facility is comprised of mostly clay and migration into the soil is minimal. The Vickery facility has a series of Surface Water management gate that would be closed in the event a spill took place in that surface water management area.

FIGURE 2-1
RESPONSE ACTIVITIES
VICKERY FACILITY



In addition, the Vickery facility is equipped with secondary containment to control any release that might occur from tank farms. The EC will evaluate whether or not the engineered controls have removed the potential for the release to leave the property or to enter Myers ditch. The EC will enact the contingency plan in the following situations:

a. Any fire involving hazardous waste; OR

b. Any explosion involving hazardous waste; OR

c. Any uncontrolled hazardous waste reaction that produces or has the potential to produce hazardous conditions, including noxious, poisonous, flammable and/or explosive gases, fumes, or vapors; harmful dust; or explosive conditions; OR

d. Any fire or explosion that has an increased potential to threaten human health or the environment due to its proximity to a hazardous waste management unit; OR

e. Any hazardous waste release that produces or has a potential to produce hazardous conditions, including noxious, poisonous, flammable and/or explosive gases, fumes, or vapors; harmful dust; or explosive conditions.

4. The next step is to implement all necessary control measures and ensure that the the gate attendant, and other appropriate personnel and response agencies are contacted as necessary (as described in Section 2.1). Contacted individuals or agencies will receive the following information:

a. Name of person reporting the incident;
b. Location;
c. Nature and extent of the incident; and
d. Actions taken and/or recommended.

2.1 NOTIFICATION OF EMERGENCY COORDINATOR(S)

As required by OAC 3745-54-55, at all times, there will be at least one employee on the facility premises or on call (available to respond to an emergency by reaching the facility within a short period of time) with the responsibility for coordinating all internal emergency response measures. This EC is thoroughly familiar with all aspects of the facility's contingency plan, all operations and activities at the facility, the location and characteristics of waste handled, the location of all records within the facility, and the facility layout. The EC has authority to commit the resources needed to implement the contingency plan.

On or before the first of every calendar month, the General Manager or his designee will provide an EC on-call schedule for the month. The schedule will identify the on-call EC for the month. There is one (1) EC on call at all times. The Emergency Coordinators are managers, supervisors and other qualified personnel.

Should an emergency occur, site personnel will reference the on-call schedule and immediately notify the EC.

The EC on call is accessible by phone and\or paging device and is capable of responding immediately. If the event warrants the appearance of the EC at the site after normal working hours, they

will inform the site personnel of their estimated arrival time and actions to be taken until their arrival. If their arrival time is likely to be greater than 30 minutes, they will direct the caller to contact another designated EC and ask him\her to respond until he\she can arrive. In the meantime, site personnel will continue implementing emergency response procedures without awaiting the arrival of the EC.

2.2 REPORTING REQUIREMENTS

The following external contacts are made in the event of a release to the environment of a reportable quantity of hazardous waste <u>inside</u> the facility boundaries:

1. Ohio EPA Emergency Response.....(800)282-9378
2. Ohio EPA - NWDO.....(419)352-8461

The following external contacts are made in the event of a release to the environment of a reportable quantity of hazardous waste <u>outside</u> the facility boundaries:

1. National Response Center.....(800)424-8802
2. Sandusky County Sheriff's Dept....(419)332-2613 or 911
3. Sandusky County Emergency Planning Committee ..... via Sheriff's Office
4. U.S. EPA Region V Office.....(312)353-2318
5. * U.S. Coast Guard.....(216)522-4404

* This agency must be notified if the release is to an off-site waterway.

<u>WELL SHUTDOWN - (FOR POTENTIAL DOWNHOLE PROBLEMS ONLY!)</u>

1. OEPA-NWDO (419)352-8461 (Hazardous Waste Manager)

2. OEPA-Central Off. (614)644-3020 (UIC)

3. Sandusky Co. Board of Health (419)334-6377(Ken Kerik)
[redacted] (Home #)

2.2.1 Internal Notifications and Responsibilities

Any employee discovering a fire or hazardous materials release must immediately notify the Emergency Coordinator and personnel in the immediate area who may be in danger. The names, addresses and phone numbers of the Emergency Coordinator personnel are provided in Table 2-2. Table 2-2 also lists the names of persons whom the Emergency Coordinator must notify.

2.2.2 Additional Contacts to be Made

A list of additional contacts that may be required during an emergency is listed in Table 2-3.

2.2.3 General Responsibilities

The EC is responsible for coordinating all emergency response measures during an emergency. He acts as the chief of the emergency crew during each operating shift and has complete and total control of all activities during the incident. He has the authority to designate other employees to assist him in the event of an emergency. The EC has been granted full corporate authority to expend all pertinent resources to deal with the situation.

The EC's comprehensive training in emergency response includes:

- Emergency preparedness (Contingency Plan)
- Knowledge of site Evacuation Plan (Section 6.0)
- Incident Response Guidelines
- CPR (optional)

- First Aid (optional)
- Use of fire extinguishers

If the Contingency Plan must be implemented, the EC will develop and maintain lines of communication with key community emergency services including fire and police agencies, medical facilities and emergency response units as appropriate for the incident. Section 8.0 delineates the arrangements which will be made with such organizations to assure their availability and assistance in emergency situations.

The EC is authorized to activate emergency response procedures by assembling equipment and determining its application. Section 4.0 describes the emergency equipment available to the EC, both from on-site and off-site resources.

The EC will determine the need to report to outside agencies. In the event of a spill or hazardous waste release (of a reportable quantity to the environment), a report to OEPA will be made within twenty-four (24) hours. If the EC determines that the release could threaten human health or the environment outside the facility, this notification will be made immediately. The person making such notification will give the following information:

- Name and telephone number
- Name and address of facility
- Time and type of incident (e.g., release, fire)
- Name and quantity of material(s) involved, to the extent known
- Extent of injuries, if any
- Possible hazards to the environment and human health outside the facility

2.2.4 Identification of Material and Hazard Assessment

As soon as possible the EC will determine the character, source and extent of any released materials by visual inspection and reference to manifests, sample analyses, Waste Material Profile Sheets and other available sources of information.

Initial assessment includes the following parameters:

- Source of the release
- Condition of the source: e.g., repairable leak, uncontrollable leak, easily moved, unmovable
- Container identification; e.g., label or placard information, type and size of individual containers
- Physical state and nature of the material; e.g., solid (powder, pellet, granular), liquid or gas
- Odor, if noticed; e.g., a pleasant smell (almond, ammonia, benzene, vinegar) or an unpleasant smell (sulfur, skunk, onion, sharp, biting, cleaning fluid, or paint)
- Noticeable reaction; e.g., fuming, flaming or gas evolution.

After the materials have been identified to the fullest extent possible, the EC must assess possible hazards, both direct and indirect, to human health or the environment and notify the appropriate site personnel and authorities.

The EC's hazard assessment will include information gathered from other site personnel. The Casualty Control Officer (CCO) will access the status of all on-site personnel. The CCO will relay information concerning injuries or casualties and, if necessary, notify the casualty control agencies listed in Table 2-3.

Based on his knowledge of the existing conditions, the EC will determine the following:

- Can facility personnel control the emergency? If not, he will immediately involve and notify the appropriate local, state, and federal agencies identified in Table 2-3.

- Is site evacuation necessary? If so, he will activate the Evacuation Plan (Section 6.0). If partial evacuation is required, the location of the on-site regrouping area will be designated.

- Is evacuation of local area advisable? If so, he will communicate necessary information to the Sandusky County Sheriff.

2.3 CONTINGENCY PLAN IMPLEMENTATION

Sections 1.4.1 and 2.0 identify situations which might potentially require implementation of the Contingency Plan.

2.3.1 Cleanup After Contingency Plan Implementation (OAC 3745-54-56/40 CFR 264.56)

After implementation of the Contingency Plan and after the incident is under control, the EC must ensure that, in the affected area(s) of the facility:

(1) No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed; and

(2) All emergency equipment listed in the Contingency Plan is cleaned and fit for its intended use before operations are resumed.

The owner or operator must notify the Director of OEPA and/or the Regional Administrator, and other appropriate State and local authorities that the facility is in compliance with this section, 2.3.1 (or OAC 3745-54-56/ 40 CFR 264.56), before operations are resumed in the affected areas(s) of the facility.

2.3.2 Report to the OEPA Director/Regional Administrator (OAC 3745-54-56 /40 CFR 264.56)

The incident will be noted in the operating record including the time, date, and details of the incident that required implementation of the Contingency Plan.

Within 15 days after the incident, a written report must be submitted to the Director of OEPA and/or the Regional Administrator.

The report must include:

- Name, address, and telephone number of the owner or operator;
- Name, address, and telephone number of the facility;
- Date, time, and the type of incident (e.g., fire, explosion, etc.);
- Name and quantity of material(s) involved;
- The extent of injuries, if any;
- An assessment of actual or potential hazards to human health or the environment, where applicable; and

- Estimated quantity and disposition of recovered material that resulted from the incident.

TABLE 2-1

NOTIFICATION ACTION SUMMARY

ON-SITE NOTIFICATION:

Report all emergencies to the Emergency Coordinator.

Communication Systems

Two-Way Radios:

Base Station	Main Office Building
	Truck Wash/Unloading Building
Mobile Units	Maintenance Department Vehicle(s)
	Operations Vehicles
Portable Units	(5)

Telephones for external communication (419) 547-7791 and Intercommunication at the following locations:

Truck Wash/Unloading Building
Administrative Office Building
Receipt Control
Main Laboratory
Maintenance Shop
Guard House
T-Tank Pump House
Control Room
Pump Houses No. 1, 2, 3, and 5
Filter Building 1 and 2
Employee Operations Building (lunchroom)

An additional telephone is located in the Control Room. The number is (419)547-3561.

Emergency coordinator (EC), Casualty Control Officer (CCO), and Communications Coordinator (CC)

See Incident Contact List (Table 2-2) for the names, telephone numbers and addresses of the Emergency Coordinators, and Communications Coordinators.

TABLE 2-2

SITE INCIDENT TELEPHONE CONTACT LIST

EMERGENCY COORDINATOR	ADDRESS	PHONE NO.
John Moneghan	[redacted]	[redacted]
Dennis McClure	[redacted]	[redacted]
Kennard Franks	[redacted]	[redacted]
Kevin L. Adams	[redacted]	[redacted]
Robert A. Baumer	[redacted]	[redacted]
Greg Burr	[redacted]	[redacted]
Daniel Durbin	[redacted]	[redacted]
Vince Sidoti	[redacted]	[redacted]
Steve Lonneman	[redacted]	[redacted]
Brian Franks	[redacted]	[redacted]

NOTE: If the Emergency Coordinator leaves the site, he will take a cell phone, radio or a paging device so that the site may contact him in an emergency. The contact information will be given to the Control Room Operator.

COMMUNICATIONS COORDINATOR (CC)

Steve Lonneman (419) 797-6385

NOTE: The EC will notify the General Manager as soon as possible following an incident if appropriate.

TABLE 2-3

EMERGENCY CONTACTS

GENERAL EMERGENCY	CONTACT	PHONE NUMBER
Fire/Explosion	Townsend Township Fire Dept. (primary)	911
	Clyde Fire Department	(419) 547-7123 or 911
	Sandusky County Sheriff	(419) 332-2613 or 911
Hazardous Material Spill or Release	Townsend Township Fire Dept.	911
	Clyde Fire Department	(419) 547-7123 or 911
	Sandusky County Sheriff	(419) 332-2613 or 911
	Ohio State Patrol	(419) 332-8246 or 911
	National Response Center	(800) 424-8802
	Ohio Environmental Protection Agency (Spill Response Branch)	(800) 282-9378
	Ohio Environmental Protection Agency (NW District Office)	(419) 352-8461
	USEPA Region V Office	(312) 353-2318
	Sandusky County Emergency Planning Committee	Via Sheriff
Personnel Injury	Fremont Memorial Hospital	(419) 332-7321
	Bellevue Hospital	(419) 483-4040
	Sandusky County EMS	911
	Bellevue 4 County Ambulance Service	(419) 483-3322 or 911

Give the following information to the notified agencies and authorities:

- Your name and telephone number
- Name and address of the facility
- Time and type of incident (e.g., release, fire)
- Name and quantity of material involved, to the extent known

- The extent of injuries, if any
- Possible hazard to human health or the environment, outside the facility

Some additional contacts are:

- CHEMTREC.....(800) 424-9300
- Poison Control Center Cleveland, OH.....(888) 231-4455
- Sandusky County Board of Health.....(419) 334-6377

3.0 CONTAINMENT AND CONTROL ACTIVITIES

3.1 GENERAL PROCEDURES

The facility's operations are designed to minimize the potential hazards to facility personnel, and to contain spilled or leaked materials and prevent their movement from the facility. Operational features and response activities are presented below.

3.1.1 Facility Provisions

Rainwater not accumulating in tank containments or other hazardous waste management areas flows off site. The Surface Water Management System as described in the Surface Water Management Plan (PTI 03-1567), makes possible the control of onsite surface water flow using dikes, surface grading and flow control gates. Flow control gates can be closed in the event of a material release outside a contained area. Waters associated with these events are disposed of by deepwell injection.

The well houses, pump houses and filter buildings have curbed floors. The treatment/storage tanks have secondary containment. Rainwater accumulating in tank containments is disposed of by deepwell injection.

Processing and storage tanks are equipped with level indicators and alarms where appropriate. Pressures are monitored in all injection wells. All high pressure waste transfer lines are contained within a secondary enclosure (pipe within a pipe) which, in the event of a line breakage or other failure, directs wastes to a leak detection unit which immediately sounds an alarm in the control room. Catastrophic high pressure line breaks result in automatic feed pump shutdown.

The facility is equipped with emergency electrical generators which supply power to the site areas as necessary.

The facility has developed and implemented a detailed inspection program designed to detect potential problems and discrepancies before an incident occurs. Inspections of the various process and storage areas as well as containment, alarm systems, communications and other emergency/safety equipment are conducted on a daily, weekly and monthly basis. These plans are revised when changed to the operations require modification or revision.

3.1.2 Personnel Response Activities

Vickery is prepared to respond to incidents at the facility which could cause potential emergencies, e.g., fires, explosions, spills or material releases as discussed in Section 1.4.1. Containment and control activities are initiated by the EC, who will activate facility personnel responses as follows:

Emergency Coordinator (EC) Activities

For a spill or release the EC or his designee will mobilize personnel and:

- Perform Hazard Assessment and formulate action plan for incident.
- Assemble the required response equipment: protective clothing and gear, heavy equipment (scrapers, back hoe), absorbent material (such as oil dry or sand), empty drums, drum overpacks and plugging materials.
- Determine the most appropriate containment or diking method: Earthen berms or ditches, or excavation and dikes.
- Coordinate activities of supervisory personnel and maintain constant communication with them and response teams.

For a fire or potential explosion, and to guard against a spill caused by the latter, the EC or his designee will mobilize personnel and:

- Assemble required response equipment: Emergency equipment (protective clothing and gear); fire extinguishers; water truck and heavy equipment; diking and neutralization material; and empty drums, pumps, vacuum trucks and tank trucks.
- Determine the best method of approach and containment:
  - Move in from upwind side. Never walk in or through flammable liquids or ground soaked with flammable or unknown liquids.
  - Use dry chemicals for fire suppression of flammable liquids and in situations where flash-back potential exists during cleanup of residues.
  - Use on-site water truck to flood adjacent flammable materials to cool them and control spread of fire.
  - If outside of containment area, use soil for residue containment or use adsorbents if control by earthen dikes is not possible.
- Fire fighting activities will be limited to incipient stage fires. Fires or potential fires beyond the suppressing capabilities of fire extinguishers or garden hoses will be relegated to the local Fire Department.

Communications Coordinator Activities

For a spill release, fire, or explosion, the Communications Coordinator (CC) will:

- Establish telephone contacts as directed by the EC.

Casualty Control Officer Activities

For an uncontrollable spill, release, fire, or explosion, the designated Casualty Control Officer (CCO) will:

- Coordinate movement of personnel to regrouping areas as follows (and relay information to EC):
  1. Parking lot adjacent to the storage garage south of the facility on St. Rt. 412
  2. Gate entrance to west end of facility on Twp. Rd. 244
  3. Any safe area as designated by the EC and Conduct a "head count" and relay information to EC. The "head count" will be compared to the shift roster, administrative office sign-in log for staff and visitors, the sign-in/sign-out sheet at the guardhouse, and\or Receipt Control office, the contractor sign-in/sign-out sheet at the guard house and\or Receipt Control office.

Remediation Personnel Activities

- Under the direction of the EC, these personnel may after a spill or release has been discovered:
  1. Respond to releases with a purpose of stopping or reducing the flow of the leak or release.
  2. Respond to releases or potential releases of hazardous substances as a part of the initial site response for the purpose of protecting nearby persons, property, or environment.
  3. Contain and remediate the release through plugging, diking, or patching affected areas.
  4. Personnel will respond to site emergencies such as acid, caustic, leachate releases or spills, releases to the atmosphere and mechanical failures caused by sources listed in the plan. Personnel will only respond to off site emergencies at the request of the local authorities when the spill is of a nature to spills experienced at the site.

Regulatory\Technical Personnel Activities

- These personnel are summoned by the EC to assist in managing the incident from a regulatory or technical aspect. The personnel may be assigned additional duties as the EC sees fit.
- Additional duties could be but are not limited to directing remediation, maintenance decontamination, site control, communications or casualty control activities. These additional duties assigned will be in accordance with the respective training level of the regulatory/technical personnel.

3.1.2.1 Employee Right to Refuse Hazardous Remediation Assignments

Employees of Vickery have the right to refuse a work assignment when the employee believes that the work assignment will put his/her personal safety in jeopardy or when the employee feels that his/her level of training does not qualify them to perform the work assignment safely.

3.1.2.2 Incident Command System

- Where an event occurs and the contingency plan\emergency response plan is not activated, the incident command system shall be as follows:

  The EC shall be in charge of the incident and shall have access to those site resources necessary to control and remediate the incident. The EC shall have the authority to assign

Figure 3-1: EMERGENCY COORDINATOR DESIGNATION CERTIFICATE

CERTIFICATE

The undersigned, Thomas A. Witt, does hereby certify that:

1. He is the duly elected, qualified and acting Secretary of Chemical Waste Management, Inc., a Delaware corporation.

2. Set forth below is a true, correct and complete copy of one or more resolutions duly adopted by the Board of Directors of Chemical Waste Management, Inc. by unanimous consent on September 17, 1984:

RESOLVED: That the Corporation hereby grants to the individual(s) designated as "Emergency Coordinator" in the approved Contingency Plan for the Vickery Facility to commit such of the Corporation's resources as are needed to carry out such Contingency Plan; and

BE IT FURTHER RESOLVED: That such individual(s) designated as "Emergency Coordinator" in such approved Contingency Plan be and hereby are authorized, directed, and empowered to execute and deliver for and on behalf of the Corporation any and all such contracts, agreements, documents and memoranda to be necessary and appropriate to execute the herein authorized resolution.

3. Said resolution(s) have not been modified, amended or rescinded, and are still in force and effect.

IN WITNESS WHEREOF, the undersigned does hereby set his hand and the seal of said corporation this sixth day of July, 1989.

Thomas A. Witt
Secretary

[SEAL]

FIGURE 3-1 A

LINES OF AUTHORITY FOR A VICKERY ON-SITE EMERGENCY RESPONSE

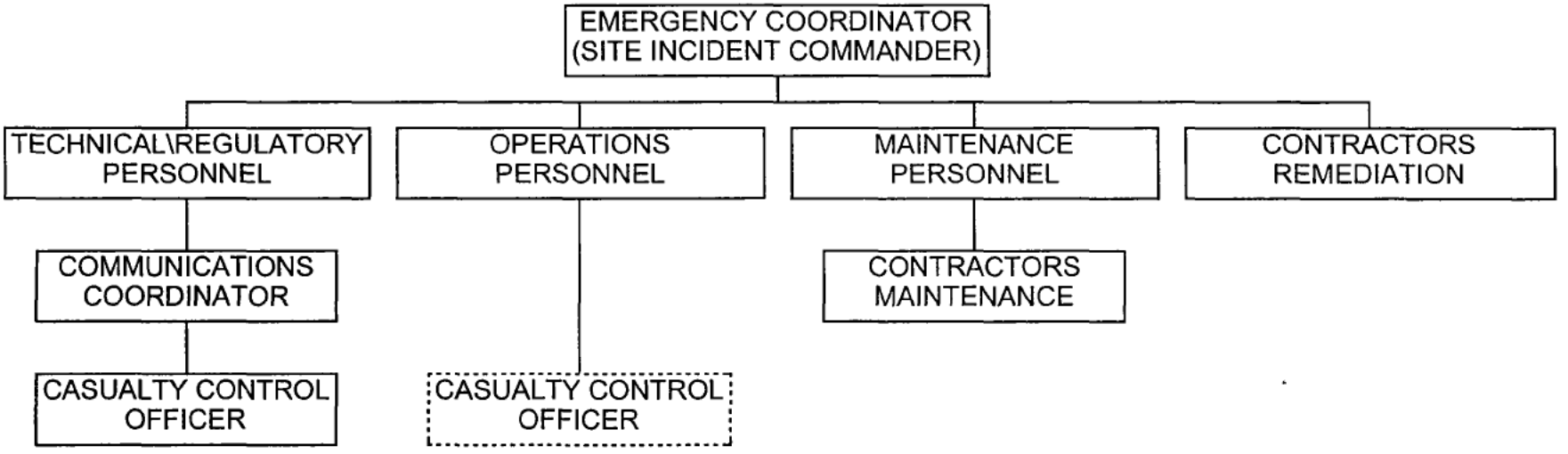


FIGURE 3-1 B

LINES OF AUTHORITY FOR A VICKERY ON-SITE EMERGENCY RESPONSE REQUIRING ASSISTANCE FROM A GOVERNMENTAL JURISDICTION

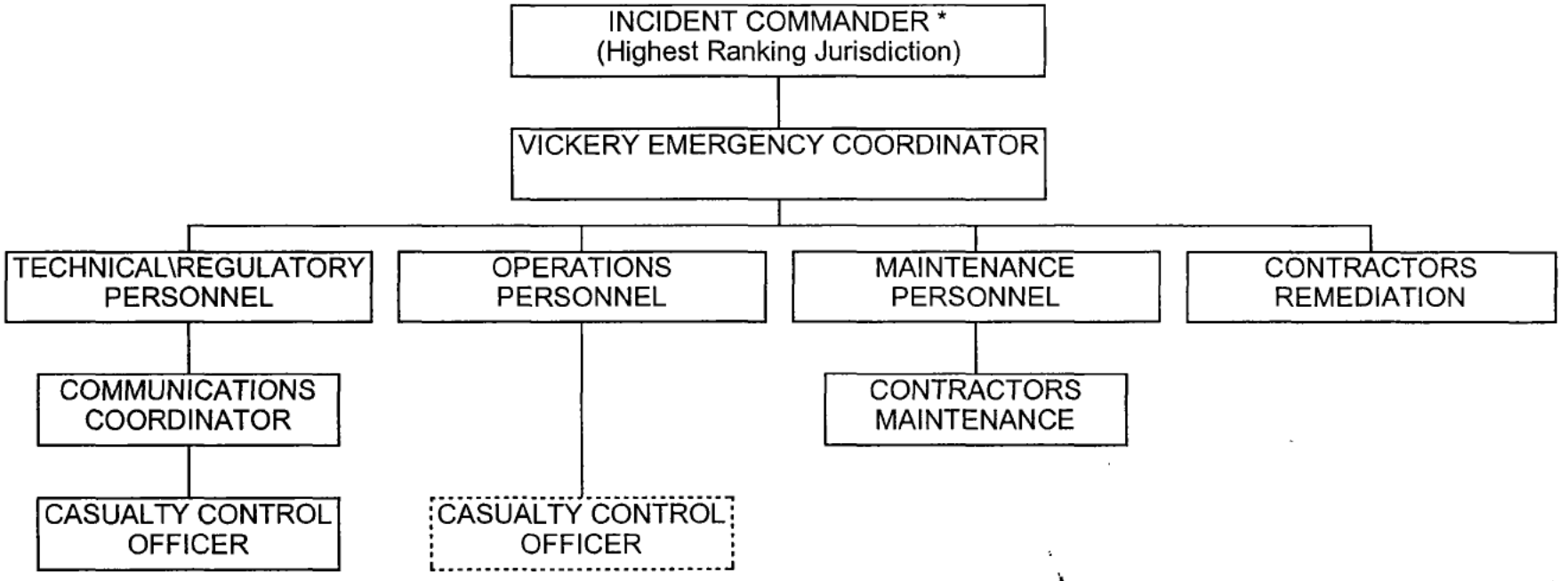
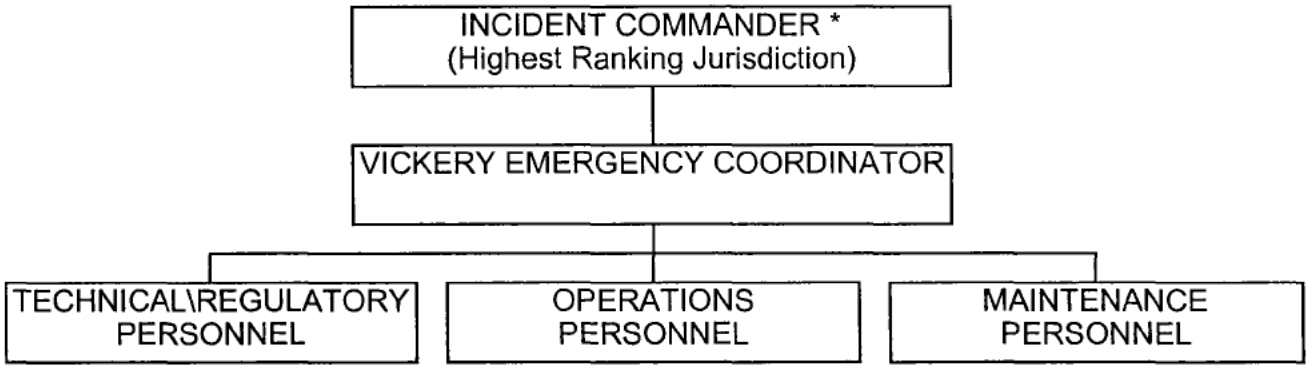


FIGURE 3-1 C

LINES OF AUTHORITY FOR A VICKERY OFF-SITE EMERGENCY RESPONSE AT THE REQUEST FROM A GOVERNMENTAL JURISDICTION



*NOTE: The Incident Commander for Emergency Responses depicted in Figures 3-1 B and 3-1 C will be the Highest Ranking Official having jurisdication for a hazardous waste spill. Normally, the local Fire Department Chief will assume the role of Incident Commander. In the absence of the Fire Chief, the Coast Guard, EPA, Ohio State Patrol and the Sheriff Department (listed here in descending order of jurisdiction) will assume control of the incident until a person of a higher jurisdiction assumes the role of Incident Commander.

site personnel as he\she sees fit. The EC shall have the authority to expend site monetary resources in order to control and remediate an incident.

The Casualty Control Officer, Communications Coordinator and other personnel assigned a task during an emergency response has the authority to assign site personnel to related duties after conferring with the EC.

- Where an event occurs and the contingency plan\emergency response plan is activated and outside assistance is obtained from the fire department or other government agency, then the highest ranking official shall be in charge of the scene. Vickery employees shall take directions from that person. The local fire chief shall assume control of the scene upon his arrival on site.
- Where an event occurs and Vickery employees are asked to assist local government agencies in responding to an environmental or other emergency, the Vickery employees shall take their directions from the Fire Department Chief or the next highest ranking official at the scene. Vickery employees shall not control the incident scene or act without direction from the Incident Commander.
- Where a Vickery employee believes that participation in an emergency response activity will exceed his training or place the employee's safety at risk, the employee may

request an alternate assignment by the EC and must be granted.

3.1.3 Spill Response Procedures

3.1.3.1 Reporting Spills

- Any employee is to report as soon as possible any spills or material release to the EC . Reports of spills should provide:
  - location
  - type of discharge
  - existence of fire or personal injury
  - immediate threat to on-site personnel
  - threat of surface waters or groundwater migration
  - name of employee
- The EC or his designee will report within twenty-four (24)* hours all spills or material releases in excess of one pound/pint to the following:
  - Ohio Environmental Protection Agency....(419) 352-8461 and (800) 282-9378

*If the EC determines that the release could threaten human health or the environment outside the facility, this notification will be made immediately and a report will be made to the following:

- National Response Center.....(800) 424-8802

Upon judging the size and condition of the spill, the EC will determine if evacuation procedures are necessary.

3.1.3.2 Controlling Spills

In the event of a spill of hazardous materials or hazardous wastes, the following procedures will be instituted:

- The EC will go to the location of the spill. He or his designee will initiate spill control and containment action immediately.
- For spills from pipes, pumps or valves, the EC or his designee shall:
  - discontinue transfer operation if in process
  - valve off leaking equipment
  - ensure that secondary containment contains released materials; remedy leak sources.
- For spills from tanks, the EC or his designee shall:
  - discontinue transfer operation if in process
  - identify lowest point of break in tank surface
  - reduce liquid level in tank below lowest point of break by transfer to another tank or tank truck
  - ensure that secondary containment contains released materials; remedy leak sources.
- For spills of sufficient magnitude to cause an emergency pollution problem, the EC or his designee shall notify, as appropriate:
  - National Response Center
  - Region V Environmental Protection Agency
  - Ohio Environmental Protection Agency
  - Sandusky County Sheriff's Department
  - Townsend Township Fire Department
  - U.S. Coast Guard (for oil spills)

3.2 PROCESS-SPECIFIC PROCEDURES

Each storage, treatment, and disposal unit at the facility will have built-in control features, containment structures or equipment to facilitate emergency response procedures. The general procedures in Section 3.1 will apply to all areas of the facility; however, containment and control activities specific to each process unit are shown in Appendix CP-1.

3.3 SITE SECURITY AND CONTROL

Site security and control during an emergency response incident will be provided as follows:

- The EC or Incident Commander will be responsible for having a hot zone, warm zone, and cold zone established and supervised by site or other designated personnel.
- Access through the cold zone, support areas and the corridor to the hot one will be controlled to prohibit unauthorized personnel such as news persons, onlookers or unnecessary response personnel from entering contaminated areas.
- Access from the hot zone will be controlled to ensure that personnel and equipment are decontaminated before the latter are allowed to exit into the cold zone.
- The EC or his designee will ensure that, where practical physical barriers are erected to prohibit access to unauthorized area.
- The assistance of local law enforcement agencies will be asked to maintain and patrol areas where site security and control is necessary.
- Site security and control will be maintained until all equipment has been decontaminated, equipment and process checks have been completed, and the emergency has been terminated by the EC or incident commander.

3.4 CONTAMINATION CONTROL

The Vickery Site Contamination Control Procedure will be followed when:

1. Decontaminating site or other emergency equipment;
2. Decontaminating personnel;
3. Establishing a contamination control strategy; and
4. Contingency Plan/Emergency Response activities are required.

4.0 AVAILABLE EMERGENCY EQUIPMENT

The facility will maintain an alarm system, a communication system and an inventory of equipment suitable for emergency response. The on-site equipment will enable facility personnel to react and respond to the majority of emergency incidents which may arise. If needed, supplemental emergency equipment supplies will be available from outside sources.

4.1 ALARM AND COMMUNICATION SYSTEMS

The Facility's Administration/Laboratory Building and Employee Lunchroom and Shower Building are equipped with central station fire detection and alarm systems. The systems can be activated automatically through the use of smoke and heat sensor units or manually by wall mounted, push button controls located at various points throughout the building. A master control unit is located on the first floor of the Administration Building, adjacent to the base radio station. This unit, upon receipt of a signal from either the smoke/heat sensors or one of the manual activators, sends an electrical impulse which activates the building's evacuation horns. At the same time, a signal is sent through a special telephone line to an outside communication service which

quickly contacts/dispatches the facility's local fire department. A second call is initiated directly to the facility to inform site personnel of the received alarm.

The facility will be equipped with a communications network to link both on-site and off-site resources. Off-site communications will be available via the local telephone system. Telephones will be located in the following buildings and treatment units a shown in Figure 4-1:

Truck Wash/Unloading Building
Office Building
Main Laboratory
Maintenance Shop
Receipt Control
Guard House
Pump Houses Nos. 1, 2, 3, and 5
Filter Building 1 and 2
Employee Lunchroom/Locker Room
T-Tank Pump House
Control Room

On-site communications are through the telephone system and two-way radio. The two-way radio system consists of a base station in the Control Room at the Truck/Unloading and Wash Building, and numerous mobile and portable hand-held units. The mobile units are located in various on-site vehicles.

Maintenance Department Vehicle(s)
Operations Department Vehicles

The two-way radio system will be used for intra and extra site communications in the event of a power failure. In addition, a messenger could be sent to the Sheriff's Dept. which is located approximately 5 miles west of the site off of State Route 412.

When off-site emergency response assistance is required from a government jurisdiction such as the Fire Dept., the EC or the designated Communications Coordinator shall ensure that the Incident Commander is provided with a site two-way radio.

When personnel are dressed out in P.P.E., the following methods of communication will be maintained where practicable during emergency response activities:

1. Two way radio
2. Respirators with speaking diaphragms and/or two-way radios
3. Hand signals which are universally understood or which are discussed by the emergency response team members prior to entering the hot zone.

Alarm System

Two-way radios in conjunction with the telephone paging system is available for use as a site alarm system for employees not located in buildings.

Automatic alarms with a manual capability exist in the Administration Building and Lunchroom. The automatic alarms are wired to an alarm service.

Communicating Spills

- Any employee is to report as soon as possible any spills or material release to the EC. Reports of spills should provide:
  - location
  - type of discharge
  - existence of fire or personal injury
  - immediate threat to on-site personnel

- threat of surface waters or groundwater migration
- name of employee

- The EC or his designee will report all spills or material releases in excess of one pound/pint in accordance with Section 3.1.3.1 of this plan.

Upon judging the size and condition of the spill, the EC will determine if evacuation procedures are necessary.

4.2 ON-SITE EQUIPMENT

The primary emergency response equipment available at the site will include the following, the location of which is shown in Table 4-1.

- ABC type extinguishers
- Emergency eyewash and shower units
- First aid stations
- Personal safety and protective equipment
- wind sock

Various types of fire extinguishers, all rated for fire types A, B, or C, are located throughout the facility as shown in Table 4-1. Water will be supplied by the facility's wells. Spigots for garden-size hoses are scattered throughout the facility.

Eye wash and safety showers are located in areas with potential for personal contact with wastes.

An example of respiratory protective equipment available at locations throughout the facility is shown on Table 4-1.

A first aid station is located on the second floor of the Truck Unloading and Wash Building.

An example of spill containment and cleanup equipment available at the facility is listed in Table 4-1.

Employees will be issued the following safety equipment as required. This equipment will be worn when performing work in areas where there is a possibility of exposure to hazardous wastes.

- Chemical resistant rubber suits (PVC)
- Chemical resistant boots (PVC)
- Full face cartridge respirators (air purifying)
- Full face shield
- Chemical resistant gloves
- SCBA's or supplied air respirators where air monitoring or safe work practices require a high level of respiratory protection.*
- Level B and Level C, P.P.E. will be assigned according to the hazard presented by the emergency.
- Boots, gloves and chemical suits are considered disposable after a spill requiring the activation of the Contingency Plan.

A wind sock is located atop storage tank T-9 located towards the back of the plant. This wind sock, which is illuminated at night, is a reliable device to site personnel in determining wind direction and approximate velocity.

4.3 OFF-SITE RESOURCES

Supplemental emergency equipment and supplies, contracting services, etc., will be available, if needed, from off-site

* Vickery Site employees will not be assigned to work in an atmosphere immediately dangerous to life or health.

(outside) sources. The Townsend Township and Clyde City Fire Departments are fully equipped and trained to respond to incidents at the facility. Back-up resources, including an aerial truck are available from the City of Fremont.

The facility is serviced by the county-wide and regulated E.M.S. system (Sandusky County E.M.S.) and a private provider (Bellevue E.M.S., Inc.). Both services are fully equipped and personnel trained in all aspects of basic and advanced life support procedures and rescue techniques. Most on-site spills can be handled by facility personnel. In the event additional resources are required (or a spill occurs off-site), the following contractors may be contacted for assistance:

O.H. Materials Company
P.O. Box 1002
16404 St. Rt. 224, East
Findlay, OH 45840
(419) 423-3526

Cousins Waste Control
1801 Matzinger Road
Toledo, OH 43412
(419) 726-1500

TABLE 4-1

SAFETY/EMERGENCY EQUIPMENT INVENTORY LIST

I. FIRE RESPONSE EQUIPMENT

Various types of fire extinguishers, all rated for fire types ABC or BC are located throughout the facility. Listed below are the number of extinguishers and their locations.

LOCATION	QUANTITY	LOCATION	QUANTITY
Guard House	1	Receipt/Sampling Area	1
Vehicle Fuel Station	1	Pumphouse #1	1
Pumphouse #2	1	Pumphouse #3	1
Pumphouse #5	1	Laboratory	4
Filter Building #1	2	Filter Building #2	2
Truck Unloading Facility	13	V-Tank Building	4
T-Tank Pumphouse	2		

II. RESPIRATORY PROTECTION EQUIPMENT

Definition of Respiratory Protection Capability Table: # of minutes refers to the number of minutes of available breathing air in each piece of equipment listed.

LOCATION	TYPE	QUANTITY	CAPABILITY
Unloading Area	SCBA	2	30 minutes
Maintenance Building	SCBA	1	30 minutes
Truck Sampling Area	Supplied Air Lines	1	N/A

III. OTHER PERSONAL PROTECTIVE EQUIPMENT/GEAR

Each employee is issued the following items dependent upon duties and job requirements:

EQUIPMENT	CAPABILITIES
Hard Hats	Protection of head from bumps and falling objects
Chemical Resistant Protective Clothing	Body protection for chemical exposure
Chemical Resistant Boots	Foot protection from chemical exposure
Cartridge Respirators (air purifying)	Respiratory protection from inhalation of hazardous material
Full Face Shields w/Attachment	Face protection from chemical exposure
Splash Goggles	Secondary eye protection from chemical exposure
Chemical Resistant Gloves	Hand protection from chemical exposure
Safety Glasses	Eye protection from flying debris

IV. SAFETY SHOWERS AND EYE WASH STATIONS

Capabilities - Combination eyewash/safety shower are capable of flushing eyes and body to remove chemicals.

PERMANENT FIXTURES:

LOCATION	QUANTITY
Maintenance	1 Combination SS/Eye Wash
Laboratory	1 Combination SS/Eye Wash 1 Eye Wash Unit
Truck Sampling Area	1 Combination SS/Eye Wash
Truck Unloading Building	1 Combination SS/Eye Wash
Filter Building #1	1 Combination SS/Eye Wash
Filter Building #2	1 Combination SS/Eye Wash

PORTABLE UNITS:

LOCATION	QUANTITY
Pump House #1	1
Pump House #2	1
Pump House #3	1
Pump House #5	1

V. FIRST AID EQUIPMENT AND SUPPLIES

The primary first aid station is located on the second floor in the Truck Unloading and Wash Building. Other first aid boxes are located in the administration building, maintenance building and operations lunchroom.

VI. OTHER INCIDENT RESPONSE EQUIPMENT

EQUIPMENT	CAPABILITIES
Portable Pumps	Cleanup of liquid material release
Pick-up Trucks	Hauling material or equipment to incident site for cleanup purposes
Semi Trucks	Hauling semi trailers to incident site for cleanup purposes
Backhoe	Building containment dikes and/or cleanup or released material
Generators	Providing electric power for tools and equipment at incident site
Front End Loader	Building containment dikes and/or cleanup of released material
Tractor	Hauling containment equipment or cleanup equipment to incident sites
Forklift	Hauling containment equipment or cleanup equipment to incident sites
Vacuum Truck or trailer	Cleanup of material that has been released
Air Compressor	Providing air for pneumatic tools at incident site
Semi Trailers (tankers)	Hauling liquid material that is cleaned up from incident site
Wooden Stakes & Wedges	Patching materials (temporary)

TABLE 4-1 CONTINUED 8/17/01

EQUIPMENT	CAPABILITIES
Dry & Pre-mixed patching materials	Patching materials (temporary)
Portable Supplied Airline	Respiratory protection
Banner Tape	Crowd Control
Plastic Sheeting	Dike & decontamination substrate
Sand Bags*	Dike material
Poly Drums*	Disposal Drums
Corn Cob*	Absorbent material
Oil Dry*	Absorbent material
Lime*	Absorbent material
Hand Tools	Working on equipment
Clay soil	Diking
Silt Screen, Hay/Straw, Oil Boom with Skirt	Diking; Redirecting; Skimming
Environmental Assessment Instrumentation Biosystems PhD	Electrochemical Sensor/LEL/O_2/Toxic Gas Indicator
Environmental Assessment Instrumentation Detector Tubes	Various (including tubes to monitor NOx)

* Items stored in bulk warehouse.

OHM Corporation

4/15/99

Figure 4-2

March 7, 1995

Mr. Paul Anteau
Chemical Waste Management
3956 State Route 412
Vickery, OH 43464

Dear Mr. Anteau:

Thank you for your continued interest in OHM Remediation Services Corp. (OHM), a wholly-owned subsidiary of OHM Corporation.

As you requested, via this letter OHM is available to respond to emergency incidents at your Vickery, Ohio facility on an as requested basis. To request our services simply call 1-800-537-9540, 24-hours a day, seven days a week. A qualified response manager will coordinate OHM's response activities.

Should you have any questions or need additional information, please call me at 419-424-4951.

Sincerely,

Derrick A Rehbein

Derrick A. Rehbein
National Account Director

DAR:kab

680

16406 U.S. Route 224 East ■ P.O. Box 551 ■ Findlay, Ohio 45839-0551 ■ 419-423-3526

5.0 CASUALTY CONTROL

The EC shall determine the existence or probability of on-site casualties and is responsible for activating the casualty control plan and designating a Casualty Control Officer.

1. The Casualty Control Officer (CCO) will assess, implement, and direct first aid for any and all injuries. The CCO will also advise the EC of the need to summon outside emergency medical assistance.
2. The Casualty Control Officer will give the details of the emergency assistance needed to the EC or his designee.
3. The EC or his designate will call the following Emergency Medical Service agencies as needed:
   a) Sandusky County E.M.S.....(419) 334-4401
   b) Bellevue 4 County Ambulance Service.....(419) 483-4444
4. When calling for emergency medical assistance, the following information must be given:
   a) The address and location of the emergency
   b) Nature of the emergency
   c) An estimate of numbers, types and conditions of Casualties
   d) The existence of hazardous conditions or special risks
   e) The name, number, and location of caller
5. The Casualty Control Officer will coordinate search and rescue operations.
6. The Casualty Control Officer will designate and inform the EC and search and rescue staff of the location of the Triage Area, and the Casualty Receiving Area (first aid station).

The Casualty Receiving Area will be located at the:

Employee Lunchroom/Locker Room Building

In case the employee lunchroom/locker room building cannot be used, the alternate Casualty Receiving Area is the:

Lunchroom - Administration Office

7. Casualties that can be safely moved by on-site personnel will be transported to the Casualty Receiving Area.
8. The Casualty Control Officer will designate a technical person to help identify injury causing hazardous agents and provide information on toxicity and decontamination.

   If needed, the following organizations may provide emergency chemical information:

   Chemtrec.....(800) 424-9300

   Poison Control Center located at the Medical College of Ohio at Toledo .....(419) 381-3897
9. The Casualty Control Officer will ensure that incoming emergency medical assistance will be escorted to the Casualty Receiving Area or emergency location.
10. The Emergency Medical Service (E.M.S.) will assume control of casualty treatment and disposition when they arrive.
11. The Casualty Control Officer shall maintain a record of all casualties; listing names, injuries, and disposition.

6.0 EVACUATION PLAN

The EC is the only person authorized to call for complete evacuation of the site in response to an emergency situation which

threatens the health and safety of facility personnel. He may take this action based upon his analysis of the situation or at the request of an on-scene public emergency services coordinator, e.g., Sheriff, Fire Chief.

6.1 SITE ACCESS AND EGRESS

The facility is located about eight (8) miles east of Fremont, Ohio. The site can be reached by road from State Highway 510 from the north or south and State Highway 412 from the east or west. Township Road 244 runs north and south along the western perimeter of the site intersecting State Route 412 at the south end. The Ohio Turnpike (U.S. 80) running east to west, lies parallel, and just north of the facility, with service plazas located approximately one mile east of this site. The area surrounding the site is predominantly farm land, with residences located within 1/8 mile to the east and west, adjacent to the site from the south and approximately 1/2 mile to the north.

The site is designed and operated to facilitate access to all points within the site for inspection and emergency response.

Enclosed processing areas are designed for emergency response and evacuation, if necessary.

Facility access is controlled and maintained during an emergency. The EC will determine the personnel to be admitted during an emergency.

6.2 EVACUATION PROCEDURES

The evacuation routes for the facility are shown in Figure 6-1.

The following actions will be taken when the EC orders a site evacuation.

1. The EC or his designee will activate emergency services by calling the Sandusky County Sheriff's Department for assistance, reporting any casualties and arranging for their emergency care. The EC will coordinate activities with the sheriff and/or other emergency agencies.
2. The EC or his designee will determine which gates will be used depending upon wind direction and the locations of the incident and personnel. The EC and/or his support staff will utilize the windsock located atop tank T-9 to ascertain wind direction and velocity.
3. The EC will broadcast evacuation instructions to area supervisors via the facility's telephone paging system and/or two-way radio system.
4. The EC will instruct site personnel to unlock the required exit gates and assist in directing evacuation.
5. All personnel, including visitors and contractors, will be instructed to leave through the exit gates designated by the EC.
6. Gate attendants are to remain at their stations to assist in accounting for outside contractors until they are relieved by the EC or his designee, or until such time as the emergency situation becomes a threat to their safety or health. No employee is to remain in an area if their safety or health is at risk.
7. Evacuation will proceed as follows:
   If downwind of incident, evacuate perpendicularly to wind direction over the most accessible route. If upwind of incident, evacuate in upwind direction.
8. Personnel will regroup at one of the following areas as designated by the EC:

Regrouping Area 1 - Parking lot adjacent to the storage garage south of the facility on State Route 412.

Regrouping Area 2 - Gate entrance to west end of facility on Twp. Road 244 (Haymill Area).

9. Once all personnel have been evacuated, plant gates are to be closed to prevent unauthorized personnel from re-entering the facility. If gates must remain open to facilitate entrance by emergency crews, a representative of the company designated by the EC will be stationed at the gate entrance. Another facility representative will be stationed at the entrance to the administrative office to prevent unauthorized entrance into the office or employee locker room.
10. The Casualty Control Officer (CCO) will initiate a head count and check it against the site attendance system. This information will be transferred to the EC.
11. All attempts to rescue or find persons will be directed by the EC or his designee in conjunction with the responding agencies.
12. In the event of a tornado or severe wind storm, all personnel will be directed to the Employee Lunchroom/Locker Room, the basement of the main office building, or the ground floor central area of the Truck Unloading Building.
13. Upon activation of the fire alarm system located at the Administration/Lab Building, the following actions will taken:

    All personnel located inside the building or its adjacent structures will evacuate immediately and relocate to a safe area upwind and away from the fire. The Telephone Operator is responsible for the administrative office sign in/sign out sheet during an evacuation. The Shift

Supervisor/EC shall be contacted immediately and upon notification of the exact location of the fire, confirm with the Control Room Operator or Telephone Operator, that the fire department has been contacted.

If the fire is out of control, the EC shall make sure that all personnel maintain a safety distance away from the fire. In addition, if possible, all adjacent vehicles are to be moved to another location to reduce the likelihood of further involvement and also allow for ample work area for responding emergency units.

The site fire response will be one of an incipient nature. That is site personnel may respond to fires of a magnitude which may be suppressed with extinguishers or a garden hose.

14. The evacuation routes from specific site buildings are indicated by the emergency exit signs located within the buildings. The evacuation routes of each building are very evident in light of the locations of the emergency exit signs, the buildings consist of one room, or each occupied room on site contains an exterior window or door (except the driver's room in the unload building).
15. For a spill release, fire, or explosion, the Communications Coordinator (CC) will:
    - Establish telephone contacts as directed by the EC

<u>Casualty Control Officer Activities</u>

For an uncontrollable spill, release, fire, or explosion, the designated Casualty Control Officer (CCO) will:

- Coordinate movement of personnel to regrouping areas as follows (and relay information to EC):

1. Parking lot adjacent to the storage garage south of the facility on St. Rt. 412.
2. Gate entrance to west end of facility on Twp. Rd. 244.
3. Any safe area as designated by the EC and conduct a "head count" and relay information to EC. The "head count" will be compared to the shift roster, administrative office sign-in log for staff and visitors, and the contractor sign-in/sign-out sheet at guardhouse and\or receipt control.

6.3 COMMUNITY IMPACT CONSIDERATIONS

In the event that areas adjacent to the site may be endangered due to the emergency, the evacuation will be initiated and controlled by the Sandusky County Sheriff's Department. The following responsibilities have been determined:

- The EC will notify the Sandusky County Sheriff's Department of the possible need to evacuate off-site areas. This need will depend on the nature, extent and rate of spread (including direction) of potential hazards to surrounding areas.
- Until local units can respond, facility personnel will, under the EC's direction, initiate roadblocks and evacuation procedures for areas adjacent to the site. This will be done, provided there are available personnel.
- The EC will maintain communication with local authorities and assist in the coordination of evacuation, emergency response and casualty control activities.

6.4 RE-OCCUPANCY OF FACILITY

The determination of when the facility may be safely reoccupied will be made by the EC in consultation with responding emergency services agencies. Site activities will only resume after the EC has given an "all clear" notification.

7.0 POST-EMERGENCY PROCEDURES

Post-emergency procedures are designed to prevent reoccurrence, to clean up and dispose of residuals, to decontaminate equipment and to provide for personnel debriefing.

7.1 PREVENTION OF RECURRENCE

The EC will take all necessary steps to ensure that a secondary release, fire or explosion does not recur. If the facility stops operations in response to a fire, explosion or release, the EC must ensure that the following procedures are carried out:

- Monitoring of all pressure valves
- Inspection for any leaks or cracks in pipes, valves, and tanks
- Inspection for gas generation
- Isolation of all collected waste materials

All operations that were initially shut down during response to the incident will not be reactivated until the EC and/or the General Manager gives the approval.

7.2 CLEANUP AFTER CONTINGENCY PLAN IMPLEMENTATION (OAC 3745-54-56/40 CFR 264.56)

After implementation of the Contingency Plan and after the incident is under control, the EC must ensure that, in the affected area(s) of the facility:

1. No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed; and

2. All emergency equipment listed in the Contingency Plan is cleaned and fit for its intended use before operations are resumed.

The owner or operator must notify the Regional Administrator and/or the Director of OEPA, and other appropriate State and local authorities that the facility is in compliance with this section, 7.2 (OAC 3745-54-56 40 CFR 264.56), before operations are resumed in the affected area(s) of the facility.

7.3 REPORT TO OEPA DIRECTOR/REGIONAL ADMINISTRATOR (OAC 3745-54-56 /40 CFR 264.56)

The incident will be noted in the operating record including the time, date, and details of the incident that required implementation of the Contingency Plan.

Within 15 days after the incident, a written report must be submitted to the Director of OEPA and/or the Regional Administrator. The report must include:

1. Name, address, and telephone number of the owner or operator;
2. Name, address, and telephone number of the facility;
3. Date, time, and the type of incident (e.g., fire, explosion, etc.);
4. Name and quantity of material(s) involved;
5. The extent of injuries, if any;
6. An assessment of actual or potential hazards to human health or the environment, where applicable; and
7. Estimated quantity and disposition of recovered material that resulted from the incident.

7.4 REOCCUPATION OF FACILITY OR EMERGENCY RESPONSE HOT ZONE

The EC will determine when it is safe to reoccupy the facility.

7.5 PERSONNEL DEBRIEFING AND CONTINGENCY PLAN REVIEW

The EC and General Manager and other appropriate personnel will review preparedness and prevention activities, response activities, casualty control and evacuation procedures with all involved personnel. Based on this review, suggestions for revisions to the Contingency Plan will be made to facility management. The review for all Contingency Plan events will be in writing.

8.0 ARRANGEMENTS WITH LOCAL AUTHORITIES AND OTHER RESOURCES

Vickery has made contact with those local and regional agencies listed in Table 8-1 which may be involved in an emergency situation. Each of these agencies have been provided with a current copy of this Contingency Plan and relevant background information. Letters of notification of any changes to the Contingency Plan will be on file at the Vickery Facility with acknowledgement of receipts.

8.1 EMERGENCY RESPONSE AGENCIES

The EC will notify certain agencies if the Contingency Plan is implemented. Townsend Township Fire Department is the primary authority in an emergency.

The County Sheriff's Department has agreed to assist in the movement of emergency personnel and equipment. Additionally, they have agreed to take the lead in the evacuation of areas surrounding

the site, if necessary. The Ohio State Highway Patrol will assist in traffic control and evacuation.

Townsend Township and Clyde City Fire Departments have been provided a copy of the Contingency Plan. The fire departments role will be concentrated about fire control and prevention as well as emergency response duties suitable to the fire departments and their level of training.

8.2 COMMUNITY EMERGENCY RESPONSE ORGANIZATIONS' ROLE

The community's role in responding to emergencies at the Vickery Facility is categorized into the following responses:

- fire suppression
- protect structures from fire impingement
- search and rescue
- medical treatment
- medical transport
- logistical support for breathing air
- manpower for diking activities
- traffic control
- evacuation assistance
- remediation activities
- logistical support for emergency response activities

8.3 VICKERY'S OFF SITE EMERGENCY RESPONSE LEVEL

Vickery will respond to environmental or other emergencies to the best of its ability with manpower and\or equipment when called upon by the community.

Vickery shall respond to environmental emergencies with available manpower and equipment when the emergency involves

materials which the site has had experience handling. For other response scenarios Vickery will provide available equipment upon request by the community.

8.4 COMMUNITY EMERGENCY RESPONSE ORGANIZATIONS INTERFACE WITH VICKERY

Vickery Emergency Response Training or interface activities shall on an annual basis include one of the following:

- An invitation to local emergency response organizations to participate in a Vickery site emergency response drill. Organizations are familiarized with site emergency response capabilities.
- A presentation to local emergency response organizations which discusses the Vickery Site Emergency Response Plan and the Community Emergency Response Organization's Role. The focus of this presentation will be the local fire departments and emergency medical services groups.

TABLE 8-1
COORDINATION AGREEMENTS

To ensure that any on-site emergency requiring outside assistance is responded to in a timely and effectively manner, Vickery has and will continue to communicate with the following response departments:

Townsend Township Fire Department	(419)547-8122
Clyde City Fire Department	(419)547-7123
Sandusky County Sheriff	(419)332-2613
Sandusky County E.M.S.	(419)334-4401
Bellevue 4 County Ambulance Service	(419)483-3322
Fremont Memorial Hospital	(419)332-7321
Sandusky County Disaster Services	(419)334-8933
Region V, U.S. EPA	(312)353-2318
Ohio EPA	1-800-282-9378
Ohio State Highway Patrol (OSP)	(419)332-8246

9.0 INCIDENT REPORTING

Section 103 of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) requires that notification be made to the National Response Center (800/424-8802) whenever there is a release of a hazardous substance to the environment outside the facility boundaries in amounts equal to or greater than the "reportable quantity".

OAC 3745-54-56 (J) and 40 CFR 264.56 further state that any emergency event requiring the implementation of the Contingency Plan will be reported in writing within 15 days to the Director of the Ohio EPA and the Regional Administrator.

Any reportable material release or waste spill must be reported to OEPA in accordance with Section 3.1.3.1 of this plan.

9.1 INCIDENT MITIGATED ON-SITE (Contingency Plan not Implemented)

- Report the incident internally on a completed report form after the incident is controlled.
- File an incident report with the facility manager and maintain incident reports in the facility's central file.

9.2 IMPLEMENTING THE CONTINGENCY PLAN

- Report the incident to local authorities and request emergency support, as needed.
- If off-site human health or environment are threatened, report the incident verbally to National Response Center, the Sandusky County Emergency Planning Committee through the sheriff's office and the Ohio EPA, immediately.
- Report the incident internally on a completed incident report form after the situation is controlled.

9.3 CLEANUP AFTER CONTINGENCY PLAN IMPLEMENTATION (OAC 3745-54-56/40 CFR 264.56)

After implementation of the Contingency Plan and after the incident is under control, the EC must ensure that, in the affected area(s) of the facility:

1. No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed; and
2. All emergency equipment listed in the Contingency Plan is cleaned and fit for its intended use before operations are resumed.

The owner or operator must notify the Regional Administrator and/or the Director of OEPA, and other appropriate State and local authorities that the facility is in compliance with this section, 2.3.1 (OAC 3745-54-56 40 CFR 264.56), before operations are resumed in the affected area(s) of the facility.

9.4 REPORT TO OEPA DIRECTOR/REGIONAL ADMINISTRATOR (OAC 3745-54-56 /40 CFR 264.56)

The incident will be noted in the operating record including the time, date, and details of the incident that required implementation of the Contingency Plan.

Within 15 days after the incident, a written report must be submitted to the Director of OEPA and/or the Regional Administrator. The report must include:

1. Name, address, and telephone number of the owner or operator;
2. Name, address, and telephone number of the facility;

3. Date, time, and the type of incident (e.g., fire, explosion, etc.);
4. Name and quantity of material(s) involved;
5. The extent of injuries, if any;
6. An assessment of actual or potential hazards to human health or the environment, where applicable; and
7. Estimated quantity and disposition of recovered material that resulted from the incident.

10.0 AMENDMENTS TO CONTINGENCY PLAN

This Contingency Plan is subject to review and amendment, if:

1. Deficiencies in the Plan are noted.
2. The facility permit is revised.
3. The facility changes in design, construction, operation, or other circumstances develop that change the potential for fires, explosions, or releases of hazardous materials.
4. The list of ECs and alternates changes.
5. The list of emergency equipment changes substantially.
6. The applicable regulations are revised.
7. The plan fails in an emergency (OAC 3745-54-54/40 CFR 264.54)

Any significant change in the Contingency Plan that impacts an agency will be reviewed and discussed with that agency or emergency response authority. New Contingency Plan documents will be prepared and distributed by certified mail to local, state, and federal agencies. Facility personnel will be informed of all changes in the Plan with copies available to personnel responsible for its implementation.

This Contingency Plan may be updated when technological advances, changes in government regulations, corporate procedures, market availability, or more efficient management practices warrant a change. Some anticipated areas where changes may occur are listed below:

- Procedures
- Sampling Equipment
- Operations Equipment
- Remedial Equipment and Supplies
- Specific inventories of itemized equipment and supplies

When changes referred to in the above paragraph occur, the Ohio EPA will be notified verbally or in writing.

11.0 TYPES OF WASTES RECEIVED BY THE FACILITY

This section describes the chemical and physical nature of the hazardous wastes received and managed at the facility and expected to be received and managed at the proposed facility.

CHEMICAL AND PHYSICAL CHARACTERISTICS

The wastes currently received by the existing IAWTS facility are best described by the three categories of wastes delineated in Table 11-1. The waste categories include acids/acid waters, caustics/caustic waters and neutral waters . Table 11-1 defines typical EPA Hazardous Waste numbers for each type of waste.

In the existing facility, where all wastes are treated in the Waste Treatment/Storage Tanks, segregation of wastes into the separate treatment systems is not necessary.

Vickery will use the Waste Analysis Plan to fully describe and categorize received wastes and ensure compliance with applicable

regulations. The WAP also ensures that incompatible wastes are properly segregated.

TABLE 11-1
REPRESENTATIVE WASTES RECEIVED BY THE EXISTING FACILITY

Waste Type
Waste Pickle Liquors and Acid Waters
Neutral Waters (Brines, Leachates), On-Site Generated Waters
Basic and Caustics Waters and Rinse Waters Aqueous Wastes
High Millivolt Wastes

In Section A of the permit application, there is a list of all of the waste codes that will be managed at the facility.

12.0 EMERGENCY MEDICAL AND FIRST AID PROCEDURE

In the event medical treatment is required by personnel located on site, the following procedure shall be followed:

12.1 NOTIFICATION

All injuries should be reported to the Safety Department. An injury would include a wound which merely receives simple first aid as the only treatment.

12.2 INJURY TRIAGE

1. Injuries which are more severe than simple first aid cases will be triaged/assessed by a person trained in CPR/First Aid.
2. The extent of the injury and the immediate care to be provided to the victim will be decided and provided.
3. Emergency transportation and medical assistance will be summoned at this time where it is deemed necessary.

12.3 MEDICAL PROVIDERS AND MEDICAL TRANSPORTATION

1. The nearest medical provider to the site is Fremont Memorial Hospital, 715 South Taft Ave., Fremont, Ohio (419)334-6621.
2. The Sandusky County Emergency Medical Service can provide a level of medical care beyond that which the site is trained to provide. Also, the Sandusky County EMS has the ability to transport victims. The Sandusky County Emergency Medical Services may be contacted by dialing 911.

12.4 FREMONT MEMORIAL HOSPITAL (LOCATION)

St. Rt. 412 West to US 20 West (bypass). US 20 West exit onto Oak Harbor Road (also known as Stone Street), follow Stone Street South to hospital (will also follow signs to R.B. Hayes Presidential Library).

12.5 SITE CPR AND FIRST AID TRAINING REQUIREMENTS

1. At least one person per shift shall be trained in CPR and First Aid.
2. The training shall be a certified course by a medical agency such as the Red Cross.
3. The frequency of the training will depend on the certification.

12.6 FIRST AID EQUIPMENT

1. First aid boxes are located in the administration building, maintenance building, control room and operations lunchroom .
2. An extensive supply of first aid supplies including splints and a backboard are located in the Control Room.
3. First aid supplies are inventoried and replenished monthly by a contract service.

13.0 NEW TECHNOLOGY

The facility will review and employ new technology as a course of good management practice. Employee safety, environmental protection, process improvement, practicality and cost effectiveness are management areas which shall be incorporated into the review of new technology in order to assess the value of the technology to the operation of the site. All changes will be made in a manner appropriate with the hazardous waste permitting regulations.

APPENDIX CP-1
PROCESS-SPECIFIC PROCEDURES

OVERVIEW

This appendix provides a process-specific Contingency Plan for each of the waste storage, treatment, and disposal unit at the facility. Periodically, this appendix will be revised to reflect changes, modifications or additions to the units described. Following a short introduction for each unit, a description of the general safety and operating rules followed to prevent and be prepared for emergencies is provided. Following this, a list of response criteria is given. These criteria will be used to determine whether an emergency exists and whether response action should be implemented. Finally, the procedures that will be followed to respond to emergencies are provided.

TRUCK RECEIPT CONTROL STATION

INTRODUCTION

The Truck Receipt Control Station is located next to the main laboratory. Waste trucks enter the Vickery Facility through the Receipt Control Gate. The unit consists of receiving office within the trailer attached to the administrative office, and a large concrete pad, under roof, with lanes for three (3) tanker trucks. Two (2) of the truck positions have concrete curbs and slabs and provide containment in the event of minor spills. Further, the slabs are sloped longitudinally to a low point at the mid-length of each truck position.

Manifest and shipping papers of each waste load are checked here. The truck is inspected to ensure valves and hatches are closed and that no leaks are evident before proceeding onto interior site roads. The truck proceeds to the scale where it is weighed. The truck then proceeds to the Truck Unloading Facility.

GENERAL SAFETY AND OPERATING RULES

The truck is positioned on the slab and carefully inspected for potential leaks.

No smoking, welding, or other spark-generating activities are allowed in the vicinity of the vehicle.

RESPONSE CRITERIA

A. Fire and Explosion

- Fire, either in the truck's fuel system or engine, or in the waste tank itself.

- Explosion, in either the truck's fuel system or engine, or in the waste itself.

B. Spills or Material Releases

- Leaks or spills from the waste tank, valves or pumps.
- Truck fuel leakage.

RESPONSE PROCEDURES

A. Fires or Explosions

- Evacuate personnel from the unit and vicinity.
- Equip all response personnel with appropriate protective clothing and respiratory protection.
- Shut off valves, pumps, and electrical service, as appropriate.
- Use CO_2 and/or dry chemicals on the fire itself.
- Cool adjacent tanks, equipment and buildings with water.
- If fire is not controlled in five (5) minutes, call for outside assistance and initiate the facility evacuation plan.
- When the emergency is over, clean up the affected area, put the response equipment back in readiness, and restock emergency response supplies.
- If a tank has exploded, immediately evacuate the facility and respond to any fire as described above and/or respond to spillage of wastes as described below.

B. Spills or Material Releases

- Shut off the valves, pumps, and electrical equipment, as appropriate.
- Equip response personnel with appropriate protective gear.
- If the truck's tank itself is leaking or overflowing, remove the wastes to another tank trailer(s).

- If a valve, pipe, hose, or pump is leaking or spilling, isolate this equipment by shutting off the appropriate valves.
- Clean up the area affected by the release, repair or replace the tank or equipment, clean up and decontaminate response equipment, and restock emergency response supplies.

TRUCK UNLOADING AND SAMPLING FACILITIES

INTRODUCTION

These facilities consist of: The truck unloading and wash building, the sand interceptors, the waste receiving sump tanks, the waste head gas scrubber, the solids handling unit, and an exterior bay. Sampling may occur in the interior or exterior bays. In addition, a second sampling area is located adjacent to the administration building.

The truck unloading and wash building has two (2) interior unloading bays at its east end and one (1) exterior bay. The floors of each are sloped to sumps located to one side of the bay about midway along the length of the bay. One such sump serves the two interior bays, and another serves the exterior bay. Each sump has quick-connections for hoses and one (1) working drain pipe. The hose connections lead, via underground carrier pipes within protective shield pipes, to four (4) sand interceptors set in a pair of underground concrete chambers just beyond the east end of the building. The sand interceptors are each, in effect, small settling vessels with screened inlets to control entrance of debris. The interceptor outlets go through piping manifolds into any of four (4) waste receiving tanks (V-tanks) that are set below grade in a nearby reinforced concrete chamber. Each of the hose connections and its corresponding sand interceptor will normally be dedicated for extended periods, along with one of the waste receiving V-tanks, to receipt of a particular group of mutually compatible wastes. Problems with mixing of incompatible wastes in the truck unloading portion of the facility will thereby be avoided. The incoming wastes in the four waste receiving V-tanks will then be pumped to the various sections of the IAWTS, as determined by processing requirements based on laboratory tests.

The truck unloading bays also have an internal washing system, consisting of a spray nozzle hung from a track mounted near the ceiling. After the truck has been unloaded, this nozzle is lowered into the truck's hatch and turned on for a set period. The wash water is drained out through the still-connected hose into the sand interceptors and waste receiving sump vessels.

The waste-head gas scrubber draws vapor, under a slight vacuum, from the head-space above the liquid in the sand interceptors, the V-tanks and all of the major waste storage and treatment tanks. The duct carrying this vapor goes into the bottom of a packed scrubbing tower and is then discharged through a tall stack. A recirculating caustic solution is sprayed into the top of the scrubbing tower, removing most of the offensive gaseous components, and flows out the bottom of the tower to the holding tank for recirculation.

The Solids Handling Unit of the final IAWTS consists of a curbed concrete pad northeast of the Truck Unloading Building upon which a roll-off bin can be set. A monorail suspended above this pad can go over the sand interceptor chambers. When the sand interceptors are sufficiently filled with solids to impair effectiveness, they can be lifted out bodily, moved along the monorail to the roll-off bin and tilted so as to dump into it.

GENERAL SAFETY AND OPERATING RULES

The waste truck must first be positioned in the unloading bay so the tanker's discharge valve is positioned within the contained area draining to the sump. The discharge hose must then be connected to the correct quick nozzle, and to the truck discharge outlet. Each of the quick-connect nozzles for the receipt of wastes, and the units to which it leads are normally dedicated to

a particular group of mutually compatible wastes. It is the responsibility of Vickery personnel to see that connection is made to the proper nozzle, that is, to one that is compatible with the waste being unloaded. During unloading, or whenever the truck's hatches are open (including the periods during internal washing), no smoking, welding, or other spark-generated activities will be permitted near the vehicle.

Operation of the sand interceptors is essentially automatic, and does not need outside attention except for periodic inspection of the solids level. The operation of the waste receiving sump tanks is also largely automatic, except for manual setting of valves and of pump operation to move the liquids from the tanks into the major storage and treatment tanks of the IAWTS.

Scrubber operation is also essentially continuous and automatic, although periodic checking of scrubber solution pH and composition, blowdown, and makeup and addition of new solution is to be done manually.

The solids handling unit's operation is manually controlled, but relatively infrequent. The emptying of the sand interceptor boxes has the hazard of being contaminated with a variety of waste components. Personnel performing this task must wear full protective clothing from the very beginning to the end of the task.

RESPONSE CRITERIA

A. Fires and Explosions
   - Fire in or adjacent to the unit
   - Explosion of the unit

B. Spills or Material Releases
   - Leaks or spills from tanker trucks, tanks or appurtenant piping, valves, or pumps

- Overflow of a tank
- Hose, coupling, or pipe breaks during loading/unloading operation
- Gaseous emission from a tanker truck

RESPONSE PROCEDURES

A. Fires or Explosions

- Evacuate personnel from the unit and vicinity.
- Equip all response personnel with appropriate protective clothing and respiratory protection.
- Shut off valves, pumps, and electrical service, as appropriate.
- Use CO_2 and/or dry chemicals on the fire itself.
- Cool adjacent tanks, equipment and buildings with water.
- If the fire is not controlled in five (5) minutes, call for outside assistance and initiate the facility evacuation plan.
- When the emergency is over, clean up the affected area, put response equipment back in readiness, and restock emergency response supplies.
- If a unit has exploded, immediately evacuate the facility and respond to any fire as described above and/or respond to spillage of wastes as described below.

B. Spills or Material Releases

- Shut off valves, pumps and electrical equipment, as appropriate.
- Equip response personnel with appropriate protective gear.
- If a tank or tanker truck is leaking or overflowing, remove the wastes to another tank or tank trailer(s).
- If a valve, pipe, hose, or pump is leaking or spilling, isolate this equipment by shutting of appropriate valves.

- Clean up the area affected by the release, repair or replace the tank or equipment, clean up and decontaminate response equipment, and restock emergency response supplies.

PUMP HOUSES AND FILTER BUILDINGS

INTRODUCTION

The Pump Houses and Filter Buildings are one-story steel framed structures set on concrete slabs. The slabs generally have curbs all around and floor drains. The waste and other piping in the building, as well as the equipment and utilities, are usually quite complex. However, the containment system is generally adequate to contain most spills.

A variety of pump types (both centrifugal and positive displacement), materials (both corrosion-resistant metals and plastics), and sizes are used, with similarly varying packing and seal mechanisms. Some of the packing and seal mechanisms customarily leak a small amount of the pumped fluid; others require a continuous flushing with a small amount of clean water. Both such flows are contained and transferred to the waste management system. Spills are uncontrolled flows resulting from rupture of pipes or pump casings, or gross failure of the pump packing or seals. Most such spills will be caught by the curbing and drained to the local sump, but prompt action will still be required to address pipe or equipment failure.

The pressure-leaf filters and the recessed-plate filter press are complex pieces of equipment with elaborate cycles of sequential operating steps, which will not be described here. However, particularly with the recessed plate press, leakage of small amounts of waste during filter runs is normal. This occurs because the reseating of the seals between the large number of plates at the start of each filter run is frequently imperfect, but the imperfection does not become apparent until the run is partially completed. The curbing, containment and drainage system is usually

adequate to handle this controlled leakage. Spill control measures are only required when the leakage is large and uncontrolled or when there is an actual rupture of piping or equipment. The machine contains a substantial amount of lubricating and other oils. Although not in themselves hazardous, leakage of these oils can cause difficulty if they get into the floor drains and are pumped into the IAWTS.

The hazard comes from possible reactions with various oxidants in certain wastes, and the simple fire hazard from floating oils.

GENERAL SAFETY AND OPERATING RULES

Pumps and filters may be either manually or automatically controlled. Periodic inspections, as detailed in the Inspection Plan, for proper performance, including the absence of excessive waste leakage or any leakage of lubricating or hydraulic oil, is the main operating rule. For manually-operated units, it is desirable to observe the unit briefly after starting (or stopping) it to see that it is functioning properly. If excessive waste leakage is observed, full protective clothing must be put on before approaching the equipment, even to turn it off, because in certain cases (such as the jamming of check valves in the open position) shutting of the equipment may not stop the flow of waste from the leak.

RESPONSE CRITERIA

A. Fire and Explosion
   - Fire in or adjacent to the pump or filter unit
   - Explosion of the unit

B. Spills or Material Releases
   - Excessive leaks or spills of waste from pumps or filters, or any leaks or spills from appurtenant piping or valves.

- Leaks of lubricating of hydraulic oil from pumps or filters.

RESPONSE PROCEDURES

A. Fires or Explosions

- Evacuate personnel from the unit and vicinity.
- Equip all response personnel with appropriate protective clothing and respiratory protection.
- Shut off valves, pumps, and electrical service, as appropriate.
- Cool adjacent tanks, equipment and buildings with water.
- If the fire is not controlled in five (5) minutes, call for outside assistance and initiate the facility evacuation plan.
- When the emergency is over, clean up affected area, put response equipment back in readiness, and restock emergency response supplies.
- If a unit has exploded, immediately evacuate the facility and respond to any fire as described above and/or respond to spillage of wastes as described below.

B. Spills or Material Releases

- Shut off valves, pumps, and electrical equipment, as appropriate. Equip response personnel with appropriate protective gear. If a pump, filter, valve, or pipe is leaking or spilling waste, isolate this equipment by shutting off appropriate valves. Clean up area affected by the release, repair or replace the tank or equipment, clean up and decontaminate response equipment, and restock emergency response supplies.

FILTERED ACID TANKS (FAT) AND WELL HEADS

INTRODUCTION

The FAT tanks are surge tanks that are usually situated close to the deepwells that they serve. Also close by are Pump Houses Nos. 1, 2, 3, and 5, which serve the various deepwells, and which have been discussed earlier herein. Except for their isolated locations, the FAT tanks are similar to the major IAWTS tanks, as are their hazards, operating rules and safety precautions; thus the FAT tanks can be handled according to the procedures in the section "Major Storage and Treatment Tanks."

The well heads consist of a series of pipes connecting to both the inner casing of the well. The inner pipe conveys the waste into the injection tubing. The outer pipe is the annular space between the inner and outer casings, which contains an inert, immiscible, stationary fluid such as diesel oil. The injection tubing is pressurized to about 750 psi, whereas the outer is pressurized to about 1,000 psi. The annulus liquid is pressurized by inert gas (such as nitrogen), from a cylinder of compressed gas, and the interface level between the gas and the liquid is observable in a sight glass. Should a leak develop in either the injection tubing, or the outer casing, the automatic well monitoring system will shut down the well.

GENERAL SAFETY AND OPERATING RULES

As most of the equipment and valves on the well head are automatic, the periodic inspections described in the Inspection Plan, along with the automatic alarms, should be adequate to discover any leaks, spills, or other hazardous conditions requiring attention.

RESPONSE CRITERIA

A. Fire and Explosion
   - Fire in or adjacent to the well head unit
   - Explosion at well head

B. Spills or Material Releases
   - Leaks or spills of wastes from the well head or appurtenant piping or valves
   - Leaks or spills of annulus filler liquid from piping or valves

RESPONSE PROCEDURES

A. Fires and Explosions
   - Evacuate personnel from the unit and vicinity
   - Equip all response personnel with appropriate protective clothing and respiratory protection.
   - Shut off valves, pumps, and electrical service as appropriate.
   - Use CO2 and/or dry chemicals on the fire itself.
   - Cool adjacent tanks, equipment and buildings with water.
   - If the fire is not controlled in five (5) minutes, call for outside assistance and initiate the facility evacuation plan.
   - When the emergency is over, cleanup the affected area, put response equipment back in readiness, and restock emergency response supplies.
   - If a well head has exploded, immediately evacuate the facility and respond to any fire as described above and/or respond to spillage of wastes as described below.

B. Spills or Material Releases
   - Shut off valves, pumps, and electrical equipment, as appropriate.
   - Equip response personnel with appropriate protective gear.

- If a valve or pipe is leaking or spilling waste, isolate this equipment by shutting off the appropriate valves.
- Clean up the area affected by the release, repair or replace the leaking pipe, clean up and decontaminate response equipment, and restock emergency response supplies.

MAJOR STORAGE AND TREATMENT TANKS

INTRODUCTION

The Integrated Aqueous Waste Treatment System (IAWTS) is composed of four parts: Major storage and treatment tanks, pumps and pump houses, filters and filter buildings, and yard piping. This section covers the first part; the other parts have been covered in previous sections.

Bulk liquid wastes are stored and treated in large tanks during processing. Total tank capacity at the facility for both storage and treatment is approximately 1,200,000 gallons.

GENERAL SAFETY AND OPERATING RULES

No incompatible waste or materials are stored in the same tank. No corrosive wastes are stored in tanks that are not specifically designed for these wastes.

All tanks are equipped with pressure and vacuum relief valves as necessary. All tanks are equipped with level-of-liquid indicators and high-level alarms, and all loading operations are performed with foreknowledge of the unfilled capacity of the tank and the quantity of the waste or material to be loaded into the tank.

All valve open/close settings are checked before waste or material transfer into or out of any tank is initiated.

All tanks are located in secondary containment systems designed to hold the capacity of the largest tank plus the rainfall from a 25 year, 24-hour storm event. Any liquids in these secondary containment system units are drained to a sump and pumped into the

IAWTS for treatment and subsequent disposal in the deep wells.

No smoking, welding, or other spark-generating activities are allowed at or near tank storage units without a permit.

All tanks are equipped with caged safety ladders or railed catwalks, as appropriate, to ensure personnel safety.

The Inspection Plan has been implemented to assure observance of the above procedures, to detect leaks or spills, and to achieve annual testing of tanks.

RESPONSE CRITERIA

A. Fire and Explosion
   - Fire in or adjacent to the tank storage unit
   - Tank Explosion

B. Spills or Material Releases
   - Leaks or spills from tanks or appurtenant piping, valves, or pumps
   - Overflow of a tank
   - Pipe breaks during transfer of liquid into or out of a tank
   - Gaseous emissions from a tank (from the pressure-relief valve or otherwise)

RESPONSE PROCEDURES

A. Fire or Explosions
   - Evacuate personnel from the unit and vicinity.
   - Equip all response personnel with appropriate protective clothing and self-contained breathing apparatus.
   - Shut off valves, pumps, and electrical service, as appropriate.

- Use CO_2 and/or dry chemicals on the fire itself.
- Cool adjacent tanks, equipment, and buildings with water.
- If fire is not controlled in 5 minutes, call for outside assistance and initiate facility evacuation plan.
- When emergency is over, clean up affected area, put response equipment back in readiness, and restock emergency response supplies.
- If a tank has exploded, immediately evacuate the facility and respond to any fire as described above and/or respond to spillage of waste as described below.

B. Spills or material Releases

- Shut off valves, pumps and electrical equipment, as appropriate.
- Equip response personnel with appropriate protective gear.
- If the tank itself is leaking or overflowing, remove the wastes to another tank or tank trailer(s).
- If a valve, pipe, or pump is leaking or spilling, isolate this equipment by shutting off appropriate valves.
- Clean up area affected by the release, repair or replace the tank or equipment, clean up and decontaminate response equipment, and restock emergency response supplies.

APPENDIX CP-2
BOMB THREAT CALL CHECKLIST

1. Where is the bomb? _____
2. When will it go off? _____
3. What does it look like? _____
4. Did you place the bomb? If so why? If not, how does he/she know about it? _____

_____

_____

5. What is your name/organization? _____

****

Fill out the following information immediately after the caller hangs up:

1. Your name: _____

2. Date: _____/_____/_____ Time: _____:_____ am pm

3. Call received on extension #: _____

4. Call lasted approximately _____ minutes.

5. Did you recognize the caller's voice? (Y or N) _____

6. Did the description of the bomb location or anything else indicate that the caller was familiar with the premises? _____

_____

7. Caller's sex: MALE FEMALE
8. Caller's voice and manner (Circle all descriptions that apply):

   SPEECH: fast slow distinct stuttering nasal lisp distorted/slurred high hoarse

Other: _____

_____

Language: Educated-sounding Uneducated-sounding Foul or Profane

Other: _____

_____

Dialect: Did caller seem to speak in a foreign accent or regional American dialect?
If so can you describe? _____

Manner: Calm Angry Rational Irrational Coherent Incoherent
Deliberate Emotional Righteous Businesslike
Shouting Ill at Ease Laughing

Other: _____

9. Did you hear background noise that might suggest where the caller was? Conversations Street Traffic
Airplanes Trains Party Animals
Crowd Office Machines Factory Machines
School bell Music Public Address System

Other: _____

10. Additional comments:

_____

APPENDIX 4

TRAINING PLAN

4/15/99

VICKERY FACILITY

TRAINING PLAN

3956 State Route 412
Vickery, Ohio 43464

TRAINING PROGRAM PLAN

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1.0 INTRODUCTION

In accordance with the regulatory requirements of 40 CFR 264.16 and OAC 3745-54-16, the Vickery facility has developed this Training Plan for its facility located in Vickery, Ohio. A copy of this plan is available at the facility at all times.

Training is essential to the efficient and safe operation of all facility processes, and to rapid and effective responses to emergency conditions. It is Vickery's policy that all employees be trained to perform in a manner which emphasizes accident prevention to safeguard human health and the environment. This training program is applicable to all employees who are involved with the management of hazardous waste.

1.1 GENERAL TRAINING CONCEPT

Each new employee involved with the management of hazardous waste is trained in the general orientation and operation of the facility. A training program related to the specific duties of each job function is specifically tailored for the position. No employee is permitted to work under reduced supervision until facility management (see Organization Chart for appropriate manager) has determined that the employee has successfully completed all elements of the tailored training program. The introductory training will be completed within six months of the new employee's entry into a specific job. In addition, each employee will participate in an annual review of initial training.

1.2 PROGRAM IMPLEMENTATION

Implementation of the training program encompasses:

- Identification of training requirements (for each job);
- Selection of qualified instructors;
- Delivery of training program;
- Employee testing and performance evaluation; and
- Documentation of each training session;

Responsibility for the training program rests with the facility General Manager. The General Manager or designated representative selects qualified instructors, participates in development of the training program content and format, provides the necessary resources, and ensures that employee training records are maintained. The General Manager may appoint a training coordinator to plan, organize, and control the training programs.

2.0 FACILITY ORGANIZATION

Training is tailored to prepare the employee to properly and safely perform their jobs and respond effectively to emergency situations at the facility.

The primary functions of this facility are storage, treatment, and disposal of hazardous wastes. Properly trained operations personnel are required to successfully complete these functions. The facility organizational chart depicts the relationships of all positions which are involved with hazardous waste management.

2.1 POSITIONS

Positions associated with waste handling, currently employed at this facility may be seen in the facility organizational chart. The organization chart may change as positions are added, deleted

or reorganized. An example organization chart is shown in Figure 2-1.

Position descriptions, which include basic function(s), specific duties and responsibilities, and required qualifications, are maintained at the facility's main office for each position related to hazardous waste management. A list of person(s) currently filling each position is maintained at the facility. The facility organization chart and position descriptions will change periodically, as operations expand or are modified. The Training Plan will be amended to reflect major or substantial changes. Appendix A contains examples of position descriptions for personnel involved with handling hazardous waste at the site.

3.0 TRAINING PROGRAM

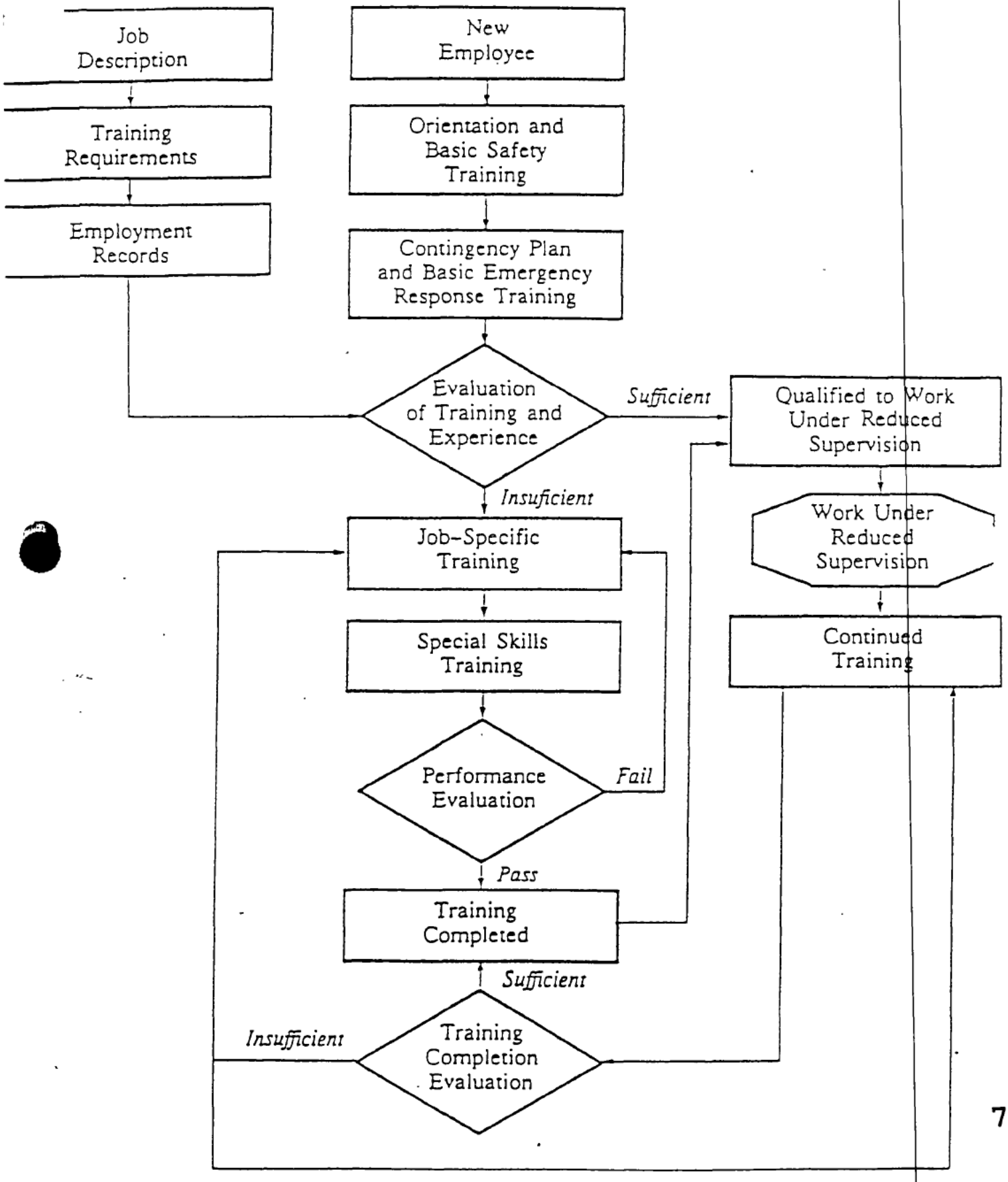
All personnel involved with hazardous waste management at this facility undergo continuing training pursuant to this plan. All new employees are introduced to the full-training and qualification process illustrated in Figure 3-1 and discussed below. New employees will be considered trainees until they have successfully completed an initial training period which will not be longer than 6 months in duration.

3.1 SCOPE OF TRAINING FOR NEW PERSONNEL

Each new employee involved with hazardous waste management undergoes introductory training composed of general training, job-specific training to varying degrees, and emergency response training (special skills). The amount of training an employee receives depends upon his/her job duties and the employee's prior experience.

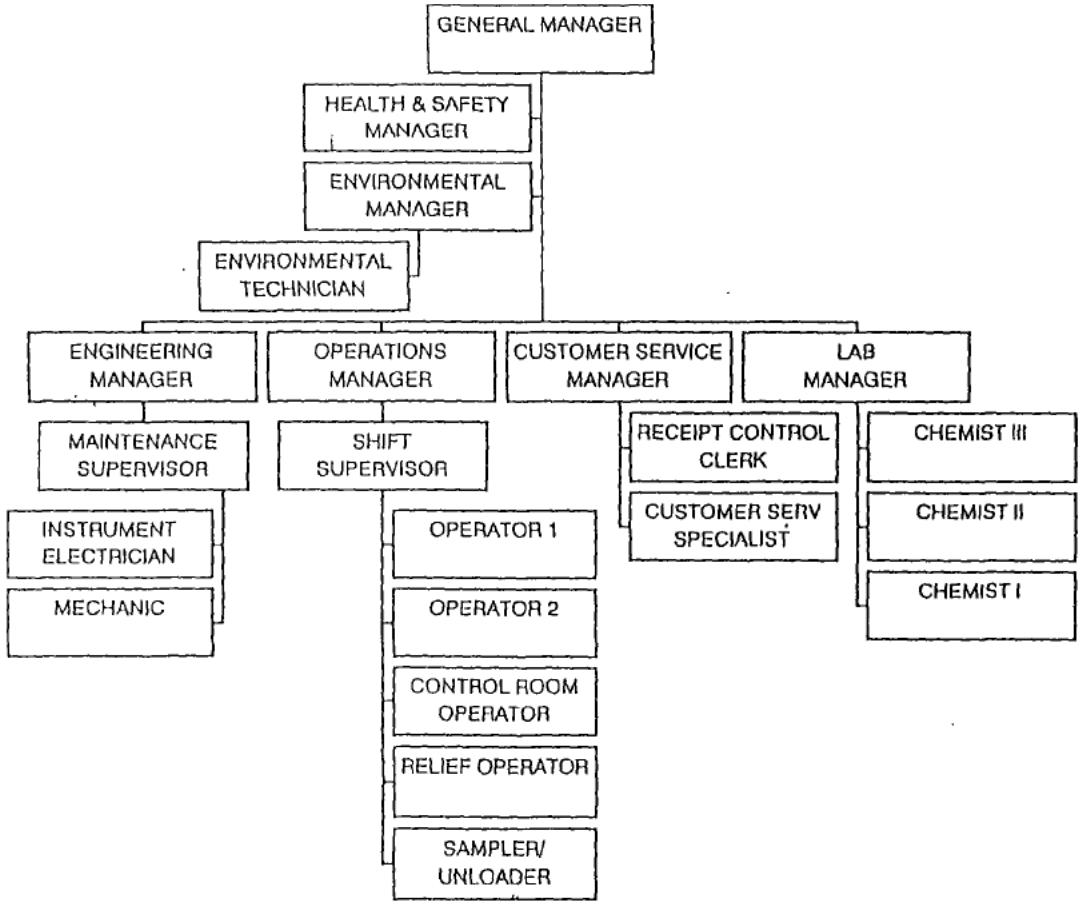
Figure 3–1

FLOW DIAGRAM OF TRAINING PROGRAM FOR ALL EMPLOYEES



VICKERY ORGANIZATION CHART FOR HAZARDOUS WASTE ACTIVITIES
FIGURE 2-1

4/15/99



3.1.1 General Training

All trainees complete a series of general training courses to familiarize them with the facility, the Contingency Plan, and basic safety skills. These courses ensure that trainees have the basic skills to participate in an emergency response with their fellow workers.

3.1.1.1 New Employee Orientation and Basic Safety Training

All trainees undergo an eight hour orientation and basic safety training session to introduce them to the company, to the management and operations of the Vickery facility, to the Contingency Plan, and to basic health and safety skills.

This orientation and basic safety training program includes procedures for entering and leaving the facility, facility layout, restricted areas, the nature and characteristics of hazardous wastes, an overview of federal, state, and local regulations, an overview of the facility's treatment and disposal processes, basic personal protection techniques and the safety rules of the facility, general facility rules, organizational structure, an outline of the training requirements, and the duties of each employee's job. During orientation, the employee is also thoroughly familiarized with the facility's Contingency Plan, especially the communications systems, evacuation procedures, and the locations of emergency equipment.

3.1.1.2 General Contingency Plan Training

Each trainee is familiarized with the facility's Contingency Plan during his or her orientation and basic safety training session. It includes:

- Description of possible emergency situations;
- Duties of the Emergency Coordinator and others;
- Emergency communication and alarm systems;
- Evacuation procedures and routes;
- Location of emergency equipment such as alarms, first aid stations, eye wash stations, safety showers, fire fighting equipment, etc.; and
- Incident/action reporting mechanism(s).

This instruction consists of classroom instruction to: (1) point out areas of potential risk; (2) identify what to look for; (3) show where alarms and emergency equipment are located; and (4) demonstrate the alternative routes to be used in the event that an evacuation is ordered. This training approach ensures that each trainee is able to respond effectively.

3.1.1.3 Basic Emergency Response and Preparedness Training

Personnel involved with hazardous waste management are trained in basic fire fighting (e.g., use of fire extinguisher). As part of their training, employees also participate in at least one emergency simulation/evacuation drill annually to practice evacuation of the facility.

3.1.2 Job-Specific Training

After completing the general training, new employees involved with hazardous waste management are given instruction to reinforce that work is performed safely. A list of required training courses is prepared and maintained for each position by the supervisor responsible for managing the position. Job-specific training addresses these major training topics:

- Chemical hazards awareness, which expands upon the hazard

recognition skills learned during orientation and basic safety training. Based upon job duties, employees learn to identify chemical hazards in their work area, common hazard warning systems used at the facility, sources of data on the chemicals, and handling precautions for the chemicals with which the employees will be working.

- Personal protection, which takes employees through the care, use, limitations, and decontamination of the respirators and protective clothing that are required for their job duties. This training supplements what the employees learned during general training about basic personal protection techniques and clothing. The employees may also learn how to use eye wash/chemical safety showers and hearing protection, if required for their jobs.

- Regulatory compliance training, appropriate for their job duties, such as manifest preparation, labeling, placarding, and waste acceptance procedures. This training also expands upon the skills learned during orientation.

- Operations and maintenance training, which provides instruction in those skills that an employee must master to perform emergency response duties. This training may include coverage of these elements as appropriate for the job duties and to reduce the risk of emergencies.

- RCRA Inspection, procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment including key parameters for automatic waste feed cut-off systems and shutdown of operations.

- Contingency Plan, Communications or alarm systems. Response to all contingency plan events.

- Spill Response, Response to spills to prevent ground water contamination incidents.

A list of courses and current position training requirements for each position are maintained at the facility. Training requirements may change due to changes in position

responsibilities, regulations and policies.

3.1.3 Special Skills Training

As appropriate for the position, each employee involved with hazardous waste management is provided with comprehensive "special skills" training to prepare the employee for his/her other specific emergency response duties. Depending upon their duties, the employees are familiarized with facility emergency procedures, emergency equipment, and emergency response systems. This specialized emergency response training includes the following elements, as applicable:

- Procedures for inspecting, using, and performing routine maintenance on the facility's emergency equipment;
- Procedures for using the communication and alarm systems;
- Response duties in the event of fires or other incidents;
- Response procedures for incidents that release reportable quantities of hazardous wastes, including spill containment/cleanup procedures to prevent ground-water contamination;
- First Aid and CPR; and
- Casualty control.

Where appropriate, the employee's emergency response training may also include the application of chemical properties to the understanding and evaluation of potential hazards. These may include vapor density, significance of upper and lower explosive limits, chemical reactivity, and the selection of proper fire extinguisher and protective clothing.

3.2 TRAINING PROGRAM ADMINISTRATION

The selection of qualified instructors, the use of effective training formats, and evaluation of an employee's learning are critical. These considerations are addressed at the Vickery Facility as described below.

3.2.1 Training Personnel Qualifications

The trainers (instructors) are recognized consultants and in-house specialists in the specific fields being taught and have broad experience in hazardous waste management. This actual hands-on experience is important so that the instructor can relate the specific subject area to actual facility operations and can answer employee questions. Specific training may be conducted by an immediate supervisor, department managers, or the General Manager.

3.2.2 Training Formats

Training is conducted in classroom meetings, in small discussion groups, in field exercises, emergency drills, and at an employee's work station (i.e., on-the-job). These activities may be supplemented by reading assignments, problem sets and other teaching aids.

For some classroom training (such as for equipment operators), courses and teaching materials developed by a manufacturer are used, either by arranging for the course to be presented on-site, or by sending employees to the manufacturer's factory training sessions. Field demonstrations and practice sessions reinforce skills and promote safety awareness.

The trainee's supervisor is responsible for on-the-job

training to ensure that the trainee learns correct procedures; can perform them accurately, reliably, and efficiently; and is safety conscious. On the job training is conducted usually one on one with qualified operations personnel. The training progress is monitored by the supervisor. Successful completion of training is documented. Corrective action is taken as soon as a deficiency is observed so that the trainee does not develop poor working habits. The trainee is assigned increasingly complex or responsible duties based on demonstrated performance.

3.2.3 Training Effectiveness Evaluation

Training effectiveness may be measured by written or oral examinations, or by job performance evaluations. The training coordinator must enter into the training record that an employee has completed the necessary training successfully. This is accomplished by entering the trainee's sign off sheet(s) into the training file when training is complete.

3.2.4 Qualification of Trainees for Work Under Reduced Supervision

No employee may perform work under reduced supervision at the facility until he or she has been qualified as fully trained. Qualification is earned through successful completion of the general training and special skills training as required by the position requirements. Qualification is also based on the employee's past education, experience, and skills. This sequence of testing and qualification is shown in Figure 3-2.

The General Manager and/or designees may determine that some special skills training is needed above and beyond the general

Figure 3–2

FLOW DIAGRAM FOR TRAINING AND QUALIFICATION

TO WORK UNDER REDUCED SUPERVISION

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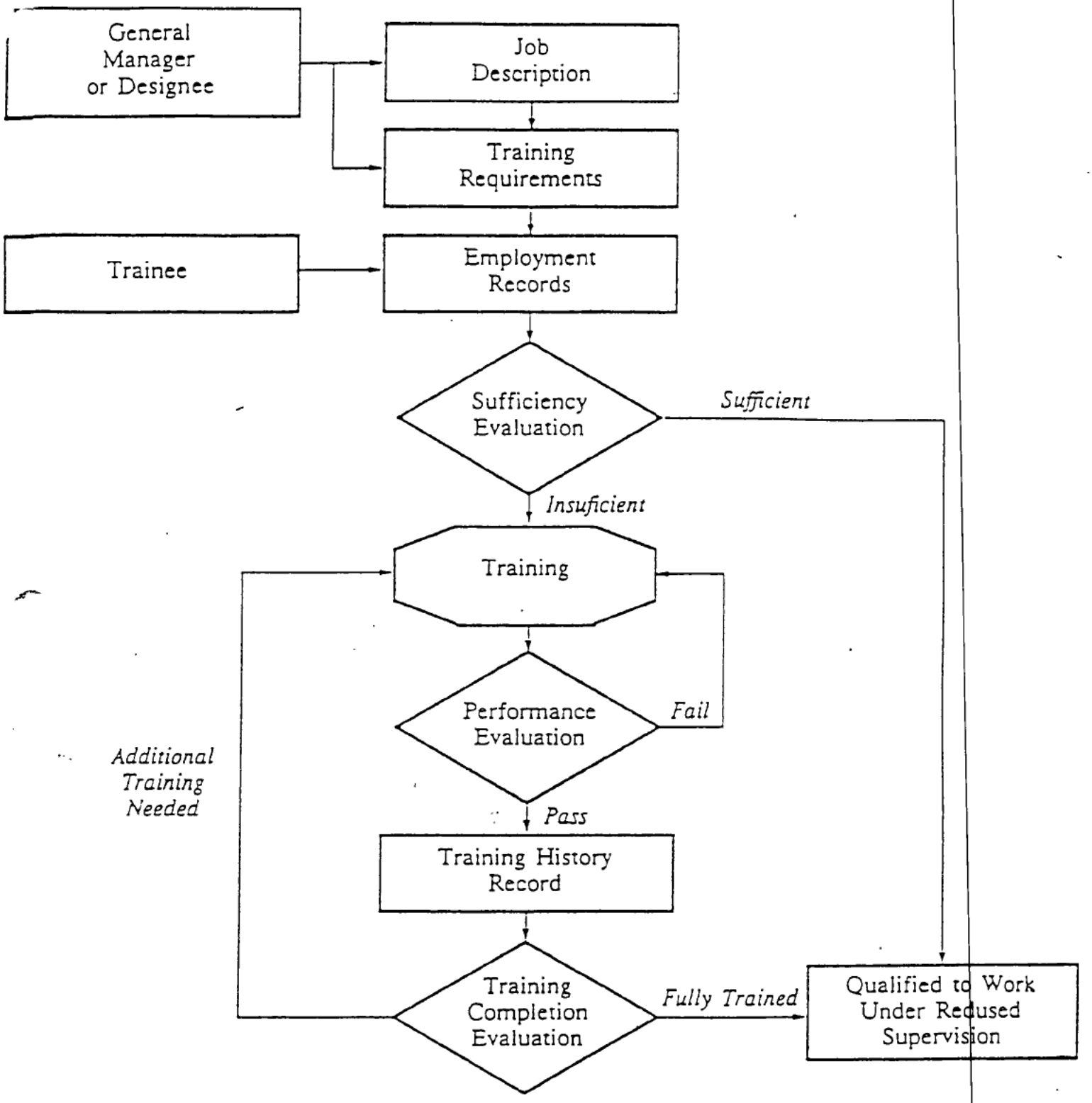

training requirements. This determination is based on comparisons of the employee's past employment records with the position description, the training requirements list, and the trainee's proficiency in completing the standard training.

This comparison results in a schedule of the necessary special skills courses for the employee. As an employee completes this training, the employee's training record is updated. This record is reviewed periodically to evaluate the employee's training completion status, until all of the required training courses have been completed. Facility management will ensure that all training has been satisfactorily completed. Upon satisfactory completion of the all required training the employee is qualified to work under reduced supervision. Some of the training requirements may be waived by the General Manager if the employee can demonstrate prior competence. Proof of competence may include transcripts from academic institutions, certificates of professional or technical course completion, demonstrated job experience elsewhere, or the passage of a performance evaluation such as a written examination.

3.2.5 Trainee Feedback

Trainee comments and constructive criticism of the training programs are encouraged throughout the entire training process. These comments are used by the trainers to modify and improve the training program scope, content, and/or format, as appropriate.

3.3 CONTINUING TRAINING

An employee's training does not end with his or her initial qualification. Periodic "refresher" training is required and provided, as discussed below.

3.3.1 Frequency of Training

Continuing training is designed to maintain proficiency in job skills, increase safety and quality consciousness, and teach new skills. Such training consists of regularly scheduled:

- Annual basic fire fighting practices;
- Annual emergency response exercises;
- Annual respirator and protective equipment reviews;
- Annual Contingency Plan refresher training;
- CPR recertification;
- Requalification of First Aid training and;
- As needed training to teach new skills, new operating procedures, or greater depth in specific areas.

This Continuing Training program is depicted in the flow diagram in Figure 3-3.

3.3.2 Continuing Training Content

Annual fire extinguisher training is performed. A training aid such as the slide program prepared by the National Fire Protection Association on the selection and use of portable fire extinguisher may be used to reinforce learned skills.

An annual emergency response review is presented by facility management. An emergency incident (e.g., spill, fire, explosion, sudden waste release) is simulated, and employees respond according to their assigned emergency response duties.

Annual refresher training related to the Contingency Plan is required of all employees. This training reviews the site operations and Contingency Plan to update previous training.

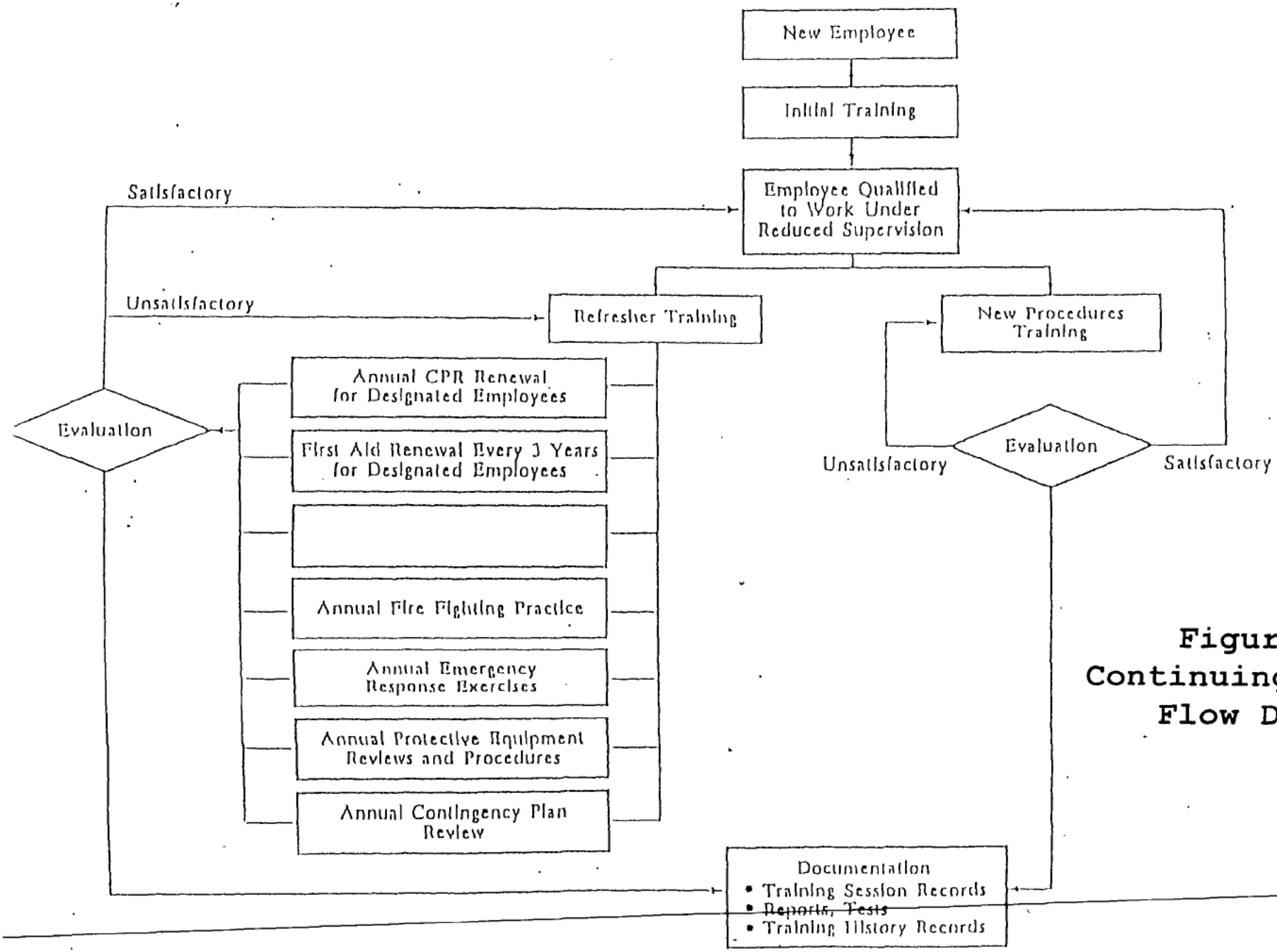

Figure 3-3
Continuing Training Flow Diagram

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As needed training is provided to cover any changes in facility procedures or operations and to teach new skills -- either before, or as such changes occur. Such training enhances the broad waste management skills of management and supervisory personnel. Some of this training may be accomplished by attending adult education classes, college courses, and seminars at off-site institutions. In addition, an annual refresher of the initial training is performed.

3.4 DOCUMENTATION OF TRAINING

Training records are maintained at the facility. These records may include: course title; identify of trainees and trainer(s); and dates of training sessions, thus documenting that the training was accomplished.

Each employee has, on-site, a position description and a position training requirements list for his or her position. Training documentation for current employees will be maintained at the facility until closure.

An employee's training history file will be sent to the General Manager of any other facility owned/operated by the family of companies to which the employee may be transferred when requested. Training files of employees who leave the employment of Vickery will be retained for 3 years at the last facility where they worked.

APPENDIX A

EXAMPLE POSITION DESCRIPTIONS

WITH POSITION TRAINING REQUIREMENT LIST

4/15/99

POSITION DESCRIPTION

Position Title: Health & Safety Manager

Division/Location: Vickery Facility Reports To: General Manager

Incumbent: _____ Approval: _____
(Employee's Name) (Signature of Supervisor)

Incumbents Signature: _____ Date: _____

1. Basic Function - (Briefly summarize the overall function and objective of the position omitting specific duties):

   Health & Safety Manager is responsible for managing the facility health and safety program, training program, site security and auditing procedures, facilities and equipment to protect the safety of our employees and facilities.

2. Specific Duties and Responsibilities - (List each significant duty and responsibility, attach additional sheet if necessary):

   a) Manage and coordinate training and education activities for all personnel.

   b) Coordinate safety meetings and drills.

   c) Manage the inspection and maintenance of all safety equipment to ensure its functionability.

   d) Ensure compliance with site, corporate and regulatory safety requirements.

   e) Record-keeping on all related items.

   f) Manage the plant security program.

   g) Develop and recommend programs, procedures and equipment changes to improve safety of site.

   h) Conduct required site inspections to detect any potential safety problems.

   i) Keep abreast of equipment and operations changes to ensure they comply with safety requirements.

   j) Responsible for administration of site Contingency Plan including but not limited to responsibilities as an Emergency Coordinator (E.C.)

3. Skills, Education, and Qualifications Required - (Indicate the skills, education, experience, and qualifications required for this position):

   a) Degree or certification in occupational health or safety related field or equivalent experience.

   b) One (1) year experience in hazardous material handling or industrial production.

   c) One (1) year health/safety experience:
      - Fire-fighting, or
      - First aid/medical care, or
      - Industrial safety

   d) Excellent oral and written communication skills to effectively communicate with all levels of personnel.

   e) Industrial management experience.

4. Safety and Environmental Responsibilities

   a) Provide a safe work environment. This includes a safe work place, equipment, materials, and training.

   b) Display leadership qualities which promote and encourage employees to follow site safety and environmental policies and practices.

   c) Participate in safety meetings, problem solving meetings, incident and near-miss investigations.

   d) Promote and manage Vickery's safety and environmental policies and programs.

VICKERY
POSITION TRAINING REQUIREMENTS

POSITION: HEALTH & SAFETY MANAGER

REQUIRED TRAINING:

A1.	Vickery Orientation and Basic Safety Training (1 time)
A2.1	Basic Fire Fighting
A2.2	Emergency SIMLT./EVAC. Drills
A3.	Contingency Plan Review
B3.	Personal Protective Equipment
B3.1	Advanced P.P.E./SCBA
B4.41	Waste Analysis Plan
C1.	Special Skills/First Aid (3 YRS)
C2.	C.P.R.
C4.	Casualty Control
C6.	Spill Response
C7.	Combustible Gas/Oxygen Testing
C8.	Toxic Gas Testing
OC1.01	Vickery Safety Policies
OC1.02	Safety Shoes
OC1.03	Safety Glasses
OC1.05	Respiratory Protection
OC1.08	Fire Protection
OC1.19	Corporate Policies & Procedures (1 time)
OC1.32	OSHA 24 Hour Emergency Response (1 time)
OC1.33	OSHA 8 Hour Emergency Response
OC2.01	Emergency Coordinator
OC2.04	Environmental Compliance
OC2.11	Incident Reporting Form

ADDITIONAL TRAINING:

4/15/99

POSITION DESCRIPTION

Position Title: Shift Supervisor

Division/Location: Vickery Facility Reports To: _____

Incumbent: _____ (Employee's Name) Approval: _____ (Signature of Supervisor)

Incumbents Signature: _____ Date: _____

1. Basic Function - (Briefly summarize the overall function and objective of the position omitting specific duties):

   Supervise, organize, and be responsible for all site operations during shift. Insure all activities are performed safely according to all regulations, company and site policy and procedures, and operating instructions.

2. Specific Duties and Responsibilities - (List each significant duty and responsibility, attach additional sheet if necessary):

   a) To assign the shift work plan and see that it is followed through.

   b) Supervise emergency response operations in case of an incident or spill .

   c) Maintain operations compliance with all regulatory, safety and company policies and procedures.

   d) Responsible for all operations and personnel during shift.

   e) Insure all inspections, readings, etc. assigned to shift are properly done and documented and signed off.

   f) Responsible for ensuring adequate pass-downs to succeeding shifts.

   g) Responsible for ensuring employees have proper training for all jobs performed and use the proper personal protective equipment.

   h) Manage all administrative duties related to documentation and operating records.

   i) Give safety meetings to shift personnel.

   j) Assign housekeeping responsibilities to personnel.

   k) Perform receipt control clerk function when required.

   l) Perform IAWTS function when required.

   m) Perform Control Room Operator function when required.

n) Must be able to participate on emergency response rescue team:

1. Contingency Plan event.

2. Confined space entry rescue.

o) CPR, first aid site provider.

3. Skills, Education, and Qualifications Required - (Indicate the skills, education, experience, and qualifications required for this position):

a) High school degree, on the job training or equivalent for at least 4 years.

b) Basic knowledge of industrial and applicable regulations including labor laws, OSHA, TSCA, and RCRA.

c) Basic supervisory skills.

d) 2 years proven supervisory skills or backup supervision.

e) Good verbal and written communications.

f) Consent Decree training.

g) Good plant knowledge of all operations.

h) Good human relations.

4. Safety and Environment Responsibilities:

a) Provide a safe work environment. This includes a safe work place, equipment, materials, and training.

b) Display leadership qualities which promote and encourage employees to follow site safety and environmental policies and practices.

c) Participate in safety-meetings, problem solving meetings, incident and near-miss investigations.

d) Promote and manage Vickery's safety and environmental policies and programs.

VICKERY
POSITION TRAINING REQUIREMENTS

POSITION: SHIFT SUPERVISOR

REQUIRED TRAINING:

A1.	Vickery Orientation and Basic Safety Training (1 time)
A2.1	Basic Fire Fighting
A2.2	Emergency SIMLT./EVAC. Drills
A3.	Contingency Plan Review
B3.	Personal Protective Equipment
B3.1	Advanced P.P.E./SCBA
B4.41	Waste Analysis Plan
C1.	Special Skills/First Aid (3 Yrs.)
C2.	C.P.R.
C4.	Casualty Control
C6.	Spill Response
C7.	Combustible Gas/Oxygen Testing
C8.	Toxic Gas Testing
0C1.01	Vickery Safety Policies
0C1.02	Safety Shoes
0C1.03	Safety Glasses
0C1.04	Sign In/out Gate Attendant
0C1.05	Respiratory Protection
0C1.08	Fire Protection Plan
0C2.01	Emergency Coordinator
0C2.04	Environmental Compliance
0C2.06	RCRA Inspection
0C2.11	Incident Reporting Form
0C2.18	Supervisor Sign Off (1 time)
0C4.32	Sampling Protocols Operations
OC5.02	Manifest/Incoming Shipments
OC5.03	Manifest/Outgoing Shipments
OC6.04	Control Room Operator

ADDITIONAL TRAINING

APPENDIX B

CONTRACTOR TRAINING REQUIREMENTS

APPENDIX B

VICKERY CONTRACTOR TRAINING PROGRAM REQUIREMENTS

The extent and type of safety training which a contractor will be required to document to the Vickery Safety Department will depend upon the scope of the work which the contractor will be required to perform.

The exact nature of the training requirements can be discussed at the project meeting where the scope of the job is detailed by Vickery's Engineering, Operations or other Technical Departments.

Note: It is the responsibility of the contractor to ensure that his employees have been trained on the following items before coming on site.

TRAINING INFORMATION WHICH VICKERY WILL PROVIDE TO CONTRACTORS

HAZARD COMMUNICATION PROGRAM

EMERGENCY EVACUATION PLAN (Contained in Contingency Plan)

CONTRACTOR'S SAFETY DECLARATION

A list of other safety training topics which might be expected to be required for routine contractual work on site is as follows:

ACTIVITIES REQUIRING A PERMIT

Confined Space Entry	Welding and Burning Procedure
Line Breaking Procedures	Fork Truck/Equipment Operation

Lock Out/Tag Out Procedure

PERSONAL PROTECTIVE EQUIPMENT

-Respirator Training

-Hearing Conservation Training

-Personal Protective Equipment for Corrosives/Acids

OTHER TRAINING

-Ladders/Scaffolding

-Trenching

29CFR1910.120 TRAINING

Contractors who may be expected to work with or be exposed to hazardous waste, emergency response activities, or hazardous waste remediation will be required to meet the training requirements listed in 29CFR1910.120 for the level of response anticipated.

APPENDIX 5

CLOSURE PLAN

4/15/99

VICKERY FACILITY

CLOSURE PLAN

2956 State Route 412
Vickery, Ohio 43454

1.0 INTRODUCTION

2.0 PURPOSE OF PLAN

3.0 GENERAL FACILITY INFORMATION
3.1 Description

4.0 CLOSURE POLICIES
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6.1.4 Sampling and Analysis
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6.2.1 Closure Procedures
6.2.2 Schedule
6.2.3 Health and Safety Plan
6.2.4 Sampling and Analysis
6.2.5 Contingent Closure
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6.3.2 Schedule
6.3.3 Health and Safety Plan
6.3.4 Sampling and Analysis
6.4 Filtered Acid Tanks
6.4.1 Cleaning Procedures
6.4.2 Schedule
6.4.3 Health and Safety Plan
6.4.4 Sampling and Analysis
6.4.5 Contingent Closure
6.5 Filter Buildings
6.5.1 Closure Procedures
6.5.2 Schedule
6.5.3 Health and Safety Plan
6.5.4 Sampling and Analysis
6.5.5 Proposed Filter Building

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- 6.6.1 Closure Procedures
- 6.6.2 Schedule
- 6.6.3 Health and Safety Plan
- 6.6.4 Sampling and Analysis

6.7 Injection Well Pump Houses
- 6.7.1 Closure Procedures
- 6.7.2 Schedule
- 6.7.3 Health and Safety Plan
- 6.7.4 Sampling and Analysis

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- 6.8.3 Health and Safety Plan
- 6.8.4 Sampling and Analysis

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- 6.9.2 Schedule
- 6.9.3 Health and Safety Plan
- 6.9.4 Sampling and Analysis

6.10 Receiving Truck Bay
- 6.10.1 Closure Procedures
- 6.10.2 Schedule
- 6.10.3 Health and Safety Plan
- 6.10.4 Sampling and Analysis

6.11 Injection Well House
- 6.11.1 Closure Procedures
- 6.11.2 Schedule
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6.12 Deepwell Closure

6.13 General Facility Areas Closure
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1.0 INTRODUCTION

This document constitutes the updated Closure Plan for the Vickery, Ohio Facility. This Closure Plan has been prepared to meet all requirements of 40 CFR 264.112 and the Ohio Administrative Code (OAC), Title 3745-55, regarding Closure requirements for hazardous waste facilities.

Copies of the approved Closure Plan for the facility will be maintained at the facility offices until certification of closure completeness has been received from the U.S. EPA and/or the Ohio Environmental Protection Agency (OEPA).

2.0 PURPOSE OF PLAN

The purpose of this document is to describe how and when the facility will be closed. This Closure Plan contains a discussion of the steps that would be necessary should Vickery decide to partially or completely close the Vickery facility during the facility's operational life. Procedures outlined for final closure are identical to the procedures that would be used for partial closure. The Plan is also designed to address the closure activities that will occur as units in the existing facility are closed and replaced by units that will comprise the proposed facility.

Closure of the facility will be done in a manner that minimizes risks to human health and the environment. This Plan covers closure of all surface storage and processing facilities and the associated deepwell injection system. Note that the injection

wells closure is part of UIC regulations and not included as part of this document.

An estimated schedule of the closure activities for each unit, other than those covered by the interim status closure plans referred to above, is presented in Section 5.0. An overall schedule for final closure of the facility is presented in Table 5-3. Closure will be completed within 180 days for each waste management unit after receiving the final volume of wastes, or within 180 days of approval of the Closure Plan, whichever is later, in accordance with 40 CFR 264.113 and OAC 3745-55-13. Vickery estimates that the entire waste inventory can be treated, removed from the site, or disposed of on-site within 90 days after receiving the final volume of wastes (based on the maximum inventory of waste on the last day of waste receipt).

Vickery will amend this plan in accordance with 40 CFR 264.112(c) and OAC 3745-55-12(B), any time the design, extent of facility operations or waste storage, or operating plans changes the closure procedures. Prior to the final closure period, the Plan will be amended within 60 days of such changes. If the changes occur during the final closure period, the Plan will be amended within 30 days.

When closure is completed, Vickery will submit two closure certifications meeting the specifications of 40 CFR 264.115 to the Ohio EPA (OEPA) and U.S. EPA to indicate that the facility has been closed in accordance with this Closure Plan and the requirements of 40 CFR 264.111-114. These will include a certification by Vickery and a certification by an independent registered professional engineer.

3.0 GENERAL FACILITY INFORMATION

As indicated, the Vickery Facility is located in Vickery, Ohio at 3956 State Route 412. A site location plan is shown on Figure 1 (Appendix E). The U.S. EPA Identification number for the facility is OHD020273819, and the Ohio EPA ID Number is 03-72-0191. Vickery operates under a U.S. EPA Part B Permit, an Ohio EPA Part B Permit (HWFAB), four UIC Permits, an NPDES Permit, an Air PTI (Permit To Install), Air PTO's (Permit To Operate), a Surface Water Management PTI, a U.S. EPA CAFO (Consent And Final Agreement) and a Consent Decree with the State of Ohio.

Currently, the facility is engaged in the treatment, and disposal of selected liquid industrial waste streams by deepwell injection. Four injection wells along with associated equipment for truck unloading, storage, treatment, and filtration of wastes are maintained on-site for the purposes of treatment and ultimate disposal of accepted wastes.

The facility is owned by Waste Management of Ohio, Inc and operated by Waste Management of Ohio, Inc., both wholly owned subsidiaries of Waste Management, Inc. The Vickery Facility was purchased in 1978 from Ohio Liquid Disposal (OLD) by Waste Management. Prior to ownership by OLD, the firm was known as Don's Oil Service and was engaged in the process of reclaiming oil. The facility has been accepting and providing ultimate disposal for wastes since the 1960s. For the purposes of the Closure Plan, a theoretical closure date of 2085 has been chosen. The facility could be maintained indefinitely.

3.1 Facility Description

The Vickery facility is located in a rural area of Sandusky County, Ohio surrounded primarily by active farmland. The topography of the site is relatively flat, sloping gently to the north. Highways border the site to the south, east, and north. To the west, a portion of the property is bordered by Meyers Ditch while a portion extends further west beyond the creek. Appendix E, Figure 2 contains a general site plan.

The Vickery community is located two miles to the northeast, Clyde is four miles south, and Fremont, Ohio is six miles to the west. The area surrounding the site is drained by Meyers Ditch to the west and Little Raccoon Creek to the east (off-site) which join before discharging into Raccoon Creek and subsequently to Sandusky Bay five miles north of the site.

The principle features of the existing facility are:

1. The Truck Unloading operation, which receives aqueous wastes accepted by the facility and includes four tanks.

2. Six existing Waste Storage and Treatment Tanks that are used to store and treat wastes received by the facility.

3. Four injection wells (deepwells), three associated Filtered Acid Tanks, well head facilities, and pump houses used to dispose of all treated aqueous wastes.

4. The Closure Cell containing fixed materials from ponds 4, 5, 7, 11 and 12 and the oil recovery area.

5. Various support units, including the truck sampling station, truck scales, laboratory, maintenance and equipment storage building, filter buildings, and administration building.

4.0 CLOSURE POLICIES

This Closure Plan identifies the steps necessary to completely close the facility or to close individual units at any point during the facility life. Vickery will ensure that the closure performance standard of 40 CFR 264.111 and OAC 3745-55-11, is satisfied by closing the facility in a manner that protects human health and the environment and that minimizes the need for further maintenance and controls necessary to prevent the post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or waste decomposition products to ground water, surface water, or the atmosphere. Vickery believes that the following closure policies and procedures satisfy the objectives of 40 CFR 264.111 and OAC 3745-55-11.

4.1 Closure Activities

Closure activities for each of the units described in this document are based upon the following assumptions:

- All elements of the Closure Plan reflect two scenarios: The "likely" scenario in which Vickery performs the work and the "alternative" scenario in which a third party performs the work.
- The inventory of wastes at the facility, except wastes being stored for off-site transfer, will be completely treated in the Integrated Aqueous Waste Treatment System (IAWTS) and then disposed by deepwell injection.

- All decontamination operations will be conducted in accordance with the procedures presented in Appendix A.

- All tanks, sumps, pressure lines, equipment, non-earthen containment systems, and building structures will be cleaned and decontaminated by triple-rinsing whenever possible followed by analysis to determine compliance with the clean closure standards. The rinsewaters will be treated in the IAWTS and then deepwell disposed.

- All solids removed from the wastes and rinsewater by the grit filters, and filter presses will be collected in roll-off boxes and shipped to approved off-site recycling/disposal facilities.

- Any soil found to exhibit the characteristic of hazardous waste will be either removed and shipped to an approved off-site recycling/disposal site or closed in place per the contingent closure plan for the area.

- All soil samples will be collected in the manner described in Appendix B. Analyses will be for waste specific metals, organic constituents (e.g., volatile organic compounds and acids, and pesticides/PCBs).

- All containment structures will be breached so that they do not collect precipitation unless partial closure occurs and containment is to be reused.

- Other support structures, including the sampling station, truck scales, laboratory, pump houses, filter buildings, and truck wash building, will be decontaminated and the collected washwaters injected into the deepwells.

- The buildings, perimeter fence, gates, and signs will be left in place.

- All on-site transportation equipment (e.g., maintenance trucks) will be decontaminated and salvaged.

- All supplies and non-waste handling equipment will be salvaged.

- The paved main road and parking areas serving the waste processing areas of the facility will be thoroughly swept and vacuumed and the collected residues sent off-site for

recycling/disposal at an approved facility.

- In accordance with 40 CFR 264.115 and OAC 3745-55-15, within 60 days of partial or final facility closure, Vickery will obtain Certification from a registered professional engineer verifying that closure activities have been conducted in accordance with this Plan.

- No later than submission of the certification of closure of each unit, a survey plat will be prepared, by a professional land surveyor in accordance with 40 CFR 264.116, indicating the dimensions and locations of all hazardous waste disposal units.

- In the event the facility performs contingent closure for any of the tanks, the facility will, within 60 days after certification of closure, record a notation on the deed to the property, that will in perpetuity notify any potential purchaser of the property that:

  a) The land has been used to manage hazardous waste;

  b) Its use is restricted under rules 3745-55-10 to 3745-55-20 of the Administrative Code; and

  c) The survey plat and record of the type, location and quantity of hazardous waste disposed of within each hazardous waste disposal unit of the facility have been filed with the local zoning authority and with the Director.

Decontamination is the preferred closure alternative, however, the above closure assumptions may be modified for three situations: (1) reuse of ancillary equipment may be selected following partial closure activities; the closure alternative will include drainage and no decontamination prior to reuse. If reuse of ancillary equipment is selected, the ancillary equipment will either be stored in a contained area until reused or decontaminated by rinsing. (2) partial decontamination prior to off-site disposal at an approved facility, and (3) no decontamination prior to off-site disposal as a hazardous waste at an approved facility.

These policies are intended to enable the facility or units/appurtenances to be used for any desired beneficial purpose after closure. All tanks, equipment, and structures may be left standing or reused following a partial closure activity. Clearly, it is impossible to predict if or how the site might be used many years from now; Vickery might find economic justification in continuing to use the facility for waste treatment or other purposes, but other uses (e.g., manufacturing) might also be justified. In either case, this Plan assumes that current use and operation of the facility will cease at final closure, and any post-closure use, however similar, will be covered by a subsequent plan, if required.

4.2 Cleanup Standards

All confirmatory samples will be analyzed for RCRA organic constituents and codes associated with all wastes handled by the facility. Each individual WMU will be evaluated for the codes that have been processed through each unit. A review of the operating record will determine the codes associated with the WMU. Table 4-1 represents the waste codes processed through FAT 1 and 2. An action plan which will contain the waste codes and action levels will be submitted as part of the requirements of OAC 3745-55-12(D)(1).

Vickery has developed a historical database for the following: Arsenic, Barium, Chromium, Lead, Mercury, Selenium, and Silver. These constituents were determined to be naturally occurring in the soil during sampling efforts from previous closure activities. Based on OEPA's Closure Plan Review Guidance Document (April 1991), Vickery used a statistical procedure to calculate "action levels"

or "upper confidence limits" for these constituents. This action level is calculated by the following equation:

Action Level = Mean + (2 x Standard Deviation)

The statistical analysis calculation information based on data from previous closure activities is presented in Table 4-2.

Action levels for other compounds, primarily organics, will be set at the detection limit for that particular constituent. All detection limits will be based on SW-846 methods as stated in OEPA's Closure Plan Guidance. OEPA has defined the detection limit as the minimum concentration of a substance that can be measured and reported with 99% confidence that the value is above zero.

As stated previously in this document, decontamination of equipment and other surfaces will include pressure washing where possible. In order to determine if the equipment has been properly decontaminated, Vickery will analyze the rinseate for the parameters listed in Action Plan. The constituent levels in the rinseate must meet the following OEPA guidance clean standards, before the equipment, storage pad or other surface is considered clean:

- Less than fifteen (15) times the public drinking water Maximum Contaminant Level (MCL) for hazardous waste constituents as promulgated in 40 CFR 141.11 and OAC 3745-81-11 for inorganics and in 40 CFR 141.12 and OAC 3745-81-12 for organics;

- If an MCL is not available for a particular contaminant, then less than fifteen (15) times the Maximum Contaminant Level Goal (MCLG) as promulgated in 40 CFR 141.50 shall be used as the clean standard;

- If the product of fifteen times the MCL or MCLG exceeds 1 mg/l or if neither an MCL nor MCLG is available for a particular contaminant, 1 mg/l shall be used as the clean standard.

Using the criteria described, Vickery will determined Action Levels for both soils and rinseate for the required constituents. These levels will be submitted as an Action Plan with the required Notification of Closure as outlined in OAC 3745-55-12 (D)(1).

Table 4-1

Chemical Constituents

for FAT 1&2,

EPA Waste Code	Constituents
D004	Arsenic
D005	Barium
D006	Cadmium
D007	Chromium (total)
D008	Lead
D009	Mercury
D010	Selenium
D011	Silver
F001	Tetrachloroethylene Methylene Chlorine Trichloroethylene 1,1,1 Trichloroethane Carbon Tetrachloride Chlorinated Fluorocarbons
F002	1,1,2 Trichloroethane Chlorobenzene 1,1,2 Trichloro-1,2,2 Triflouroethane Ortho-dichlorobenzene
F003	Xylene Acetone Ethyl Acetate Ethylbenzene Ethyl Ether Methyl Isobutyl Ketone n-butyl Alcohol Cyclohexanone Methanol
F004	Toluene Methyl Ethyl Ketone Carbon Disulfide Isobutanol Pyridine 2-Ethoxyethanol Benzene 2-Nitropropane
F006	Cadmium Chromium
F007	Cyanides (salts)
F008	Cyanides (salts)
F009	Cyanides (salts)

Table 4-1
Chemical Constituents
for FAT 1&2
(Continued)

EPA Waste Code	Constituents
K062	Chromium Lead
U044	Chloroform
U080	Dichloromethane
U151	Mercury
U211	Carbon Tetrachloride
Other	Phenols, PCBs

Table 4-2
Background Levels of Naturally Occurring Elements

Parameter	Number of Samples	Range (mg/kg)	Mean (mg/kg)	Standard Deviation (mg/kg)	Action Level (mg/kg)
Arsenic	4	5 - 16	11.5	4.65	20.8
Barium	4	37 - 140	102	55.03	212.1
Cadmium	4	-	<0.7	-	-
Chromium	4	5 - 25	17.75	8.77	35.29
Lead	4	4 - 12	9.5	3.79	17.7
Mercury	4	0.05 - 0.13	0.08	0.035	0.15
Selenium	4	-	<0.2	<0.2	<0.2
Silver	4	0.4 - 39	10.1	19.27	48.6

Table 4-3

Closure Plan Action Levels

for FAT 1 and 2

Parameter	MCL(G) (mg/l)	Soil (mg/kg)	Rinseate (mg/l)
Metals			
Total Arsenic	0.05	20.8	0.75
Total Barium	2.0	212.1	1.0
Total Cadmium	0.005	< 0.7	0.075
Total Chromium	0.1	35.29	0.15
Total Lead	0.015	17.7	0.225
Total Mercury	0.002	0.15	0.03
Total Selenium	0.05	< 0.2	0.75
Total Silver		48.6	1.0
Organics			
Acetone		ND	1.0
Benzene	0.005	ND	0.075
Carbon Disulfide		ND	1.0
Carbon Tetrachloride	0.005	ND	0.075
Chlorobenzene		ND	1.0
Chloroform	0.1	ND	1.0
Chlorinated Fluorocarbons		ND	1.0
Dichloromethane	0.005	ND	0.075
1,1-Dichloroethylene		ND	1.0
1,2-Dichlorobenzene		ND	1.0
1,2-Dichloroethane	0.005	ND	0.075
2-Ethoxyethanol		ND	1.0
Ethyl Acetate		ND	1.0
Methanol		ND	1.0
Methyl Ethyl Ketone		ND	1.0

Table 4-3
Closure Plan Action Levels
(Continued)

Parameter	MCL(G) (mg/l)	Soil (mg/kg)	Rinseate (mg/l)
Methylene Chloride (see Di-chloromethane)			
n-Butyl Alcohol		ND	1.0
Pyridene		ND	1.0
Tetrachloroethylene	0.005	ND	0.075
Toluene	1.0	ND	1.0
Trichloroethylene	0.005	ND	0.075
1,1,1-Trichloroethane	0.2	ND	1.0
1,1,2-Trichloroethane	0.005	ND	0.075
1,1,2 Trichloro-1,2,2-Trifloroethane		ND	1.0
Xylenes (Total)	10	ND	1.0
Phenols (GC/MS Method)		0.75	0.75
Cyanides		0.5	0.5
PCBs Non Detect is an acceptable level			

4.3 Soil Sampling Procedures

Soil sampling and analysis is required only when evidence of contamination is present. Areas of consideration or inspection in determining evidence of contamination will be tanks or appurtenant pipes in contact with soil, tanks with cracks in containment, sump areas with cracks, areas receiving runoff, visual signs of contamination and employee knowledge of past incidents. The purpose of a soil sampling plan is to define the full extent of vertical and horizontal contamination.

OEPA's Closure Plan Review Guidance Document contains guidelines for the development of soil sampling plans including the development of a sampling grid. The guidance includes formulas to determine the grid intervals. These equations are:

(1) $GI = (3.14A/GL)^{1/2}$; or

(2) $GI = [(A/3.14)^{1/2}]/2$

Where GL is the length of the area to be gridded (units), A is the area to be gridded (square units), and GI is the grid interval (units). Equation 1 is suited for sites over 3 acres while Equation 2 is suited for smaller sites. However, neither equation is suited for the determination of grid intervals for individual WMUs that cover small areas. Equation 2 generates 16 grids independent of area. Using equation 2, a WMU with a containment area of 625 ft^2, each sampling grid would be approximately 7' x 7' and a 0.5 acre site would have a grid sampling size of 41' x 41'. This method produces the same number of samples for a small area as a larger area. Therefore, Vickery believes that an alternative method to determine grid intervals is necessary.

Vickery proposes to sample any containment area, sump or mixing pit that is visually damaged (cracks, breaks, etc.). In

addition, Vickery will sample any areas where leaks, discharges or spills are documented. These areas include the transfer pipelines.

Sampling grid determination will be presented individually for each WMU in the closure plan. Soil sampling procedures and equipment are contained in Appendix B.

5.0 CLOSURE PLAN AND PROCEDURES

The following section describes the existing facility units to be addressed during closure, and how they fit into the fully developed waste management operations. Specific closure procedures and schedules are then provided for each unit.

5.1 Units to be Addressed by Facility Closure

The Vickery Facility consists of three basic operational areas: storage/treatment, injection and general facility. Table 5-1 lists the Waste Management Units addressed by this plan, their operational area and general closure procedure. Table 5-2 shows the maximum waste inventory in tanks for the Vickery Facility including working volume, material of construction and utilization.

In addition to the tasks identified in Table 5-1, closure of the fully developed facility will require closure of all associated equipment and facilities, include the sampling station, filter buildings and pumphouses, truck scales, truck unloading facility, truck wash building, solids handling facility, and the caustic scrubber system. Closure also involves the decommissioning of all rented and/or saleable equipment, fixtures, and materials, the termination of all utilities, and the securing of the facility.

The general facility closure procedures and estimated time

Table 5-1
VICKERY
WASTE MANAGEMENT UNITS

WMU	Operational Area	General Closure Procedure
Truck Unloading Buildings	Storage/Treatment	Decontamination
V-Tanks	Storage/Treatment	Decontamination
T-Tanks	Storage/Treatment	Decontamination
FAT Tanks	Storage/Treatment	Decontamination
Filter Buildings	Storage/Treatment	Decontamination
Pumphouses	Injection	Decontamination
Wellhouses	Injection	Decontamination
Transfer Pipelines	Injection	Decontamination
Lab Tank	General Facility	Decontamination
Receiving Truck Bay	General Facility	Closure
Injection Well House	Injection	Decontamination

TABLE 5-2
VICKERY
TANK INVENTORY

Tank	Construction	Capacity (gallons)	Utilization
T-22 (V-4)	FRP	6,000	Truck Unloading
T-23 (V-5)	FRP	6,000	Truck Unloading
T-24 (V-6)	FRP	6,000	Truck Unloading
T-25 (V-7)	FRP	6,000	Truck Unloading
T-1	CSL	200,000	Storage
T-2	CSL	200,000	Storage
T-5	CSL	200,000	Storage
T-6	CSL	200,000	Storage
T-9	CSL	100,000	Storage
T-10	CSL	100,000	Storage
FAT AR	FRP	11,750	Filtered Acid
FAT BR*	FRP	11,750	Filtered Acid
FAT 1R*	FRP	11,750	Filtered Acid
FAT 2R*	FRP	11,750	Filtered Acid
FAT 3R	FRP	11,750	Filtered Acid
FAT 5R	FRP	11,750	Filtered Acid
Lab Tank	Polyethylene	2,500	Storage

FRP - Fiberglass Reinforced Plastic
CSL - Carbon Steel Lined
* - Replacement Tanks for Existing Tanks

requirements are provided in Table 5-3. Time requirements are estimates of total time required to complete a given procedure, which is not necessarily accomplished in consecutive days. The expected duration and sequence of closure procedures are applicable to partial closure as well as final closure.

As stated previously, this Closure Plan accounts for the possibility of partial closure of individual units during the operating lifetime of the facility.

5.2 Waste Treatment Operations

This section briefly describes the waste treatment operation. The Vickery Facility currently disposes of liquid hazardous wastes from a variety of industries by deepwell injection. Four injection wells are operated. Prior to injection, all wastes are analyzed to ensure compatibility and compliance with State and Federal regulations regarding the type of wastes that may be handled. Following analysis and acceptance, the wastes are blended and filtered to remove any solid material prior to injection in the deepwells to prevent the formation of precipitates in the subsurface strata that could result in the eventual clogging of the injection zone. Residual solids are shipped off-site to approved disposal facilities. Treated and filtered wastes are then disposed in the injection zone. A summary process description of the facility is presented below. Figure 3 contains a plan view of the waste treatment operations area.

Upon arrival at the site, all waste trucks are checked at the Receiving Bay. Waste samples are collected at one of the two sampling facilities. All wastes are analyzed to confirm their identity and to obtain information needed to categorize them for treatment. Accepted wastes are unloaded at the Truck Unloading Facility. Based upon the analytical results of incoming loads,

TABLE 5-3

ESTIMATED TIME REQUIREMENTS FOR GENERAL

FACILITY CLOSURE PROCEDURES

Procedure	Time Required
Notify EPA Regional Administrator, state and local officials of closure of units addressed in the Closure Plan of Partial of final closure	At least 45 days prior to initiation
Notify generators of last date that facility will receive wastes	Variable
Inventory reduction, cleaning, decontamination, analysis, residue and rinsewater disposal for - Waste storage/treatment tanks and buildings - Truck Unloading building - Waste receiving/pre-treatment tanks - Storage and treatment tanks - Filtered Acid Tanks - T-tank pump house - Receiving truck bay	12 weeks
Decontaminate filter buildings and filters	4 weeks
Decontaminate scrubber system	4 week
Decontaminate high and low pressure transfer pipelines	4 weeks
Decontaminate filtered acid tanks	4 weeks
Decontaminate pumphouses and well heads and houses	4 weeks
Plugging and abandonment of deepwells	10 weeks
Decontaminate general facility buildings including laboratory and lab tank	4 weeks
Certification of Closure	4 weeks

acidic and aqueous wastes are unloaded through grit filters (aka, sand interceptors) to one of the waste receiving tanks. (The grit filters are used to remove gross solids). Internal truck rinsing and washing occurs in the unloading area. All rinsewater is treated and disposed of on-site.

Wastes are transferred through the V-tanks to the treatment/storage tanks or directly to the treatment/storage tanks. These treatment/storage tanks serve as storage and blending tanks. Wastes are recirculated to prevent the settling of solids.

From the blending/storage tanks, wastes flow to a filter press, and then to the FAT tanks. From the FAT tanks, wastes flow through a well protection guard filter(s) where remaining solids are removed prior to injection. All solids are removed for off-site disposal at an approved facility. The FAT tanks equalize surges in the flow of wastes being pumped to the deepwells.

5.3 Waste Disposition During Closure

The procedures used to handle all remaining inventory during the closure period will be consistent with activities conducted throughout the active life of the facility. Wastes will be blended prior to injection in the deepwells. The major waste categories and procedures to be used are listed in Table 5-4.

6.0 WASTE MANAGEMENT UNIT CLOSURE

Section 5.2 summarized the processing sequence and equipment components for areas of the Vickery Facility dedicated to treatment and disposal of liquid wastes. This section addresses the closure of each WMU listed in Table 5-1.

TABLE 5-4
WASTE DISPOSITION DURING CLOSURE

TYPES OF WASTES HANDLED	HANDLING PROCEDURES
Dilute Hydrochloric, Sulfuric, and Chromic Acids pickle liquors acid brines metal etching wastes	Blended
HF/HNO_3 Acid Waste pickle liquors other hydrochloric acid streams	Treated with reagents or directly blended
Neutral Waters Brines leachates site generated waters wastewaters	Acidified with aqueous wastes and waste pickle liquors or blended
Caustic Wastes	Blended

6.1 Truck Unloading Building

The Truck Unloading Building is a 60' x 124' x 24' high, steel framed building, with insulated siding and roof. It is set on concrete piers and a four-foot high concrete block wall. The floor is a wire-mesh, reinforced concrete slab-on-grade. The location is shown on the General Site Plan (Figure 2). The building is designed and used to unload tanker trucks and to sample the contents of the trucks. The building has 4 truck bays, 3 of which can be used to unload tankers. The two center bays are also used to wash truck interiors. The western most bay does not have the capability to unload trucks.

The floors of the unloading bays are sloped to one of two 18" deep sumps. Each sump is lined with a corrosion and spill resistant liner. The sumps drain to grit filters (shown as sand interceptors), which are used to remove solids from the waste prior to the treatment/storage tanks. Figure 4 contains the layout of the grit filters.

The various sets of unloading bays, piping, grit filters and waste receiving sumps are dedicated for extensive periods to receipt of specific groups of compatible wastes. Between receipt of different waste types, all equipment is flushed with water.

6.1.1 Closure Procedures

The following closure procedures will be used to close the Truck Unloading Building:

- Any liquid waste inventory will be transferred to the filtration and deepwell injection units for disposal. All other waste inventory will be transferred for off-site recycling/disposal at appropriate facilities;

- All empty containers and on-site treatment residues will be disposed off-site at appropriate facilities;

- All sumps, the thief pole rinsing system, concrete surfaces, pipe, fittings, etc. will be triple rinsed with a light caustic solution in accordance with the Decontamination Procedures contained in Appendix A;

- Pipeline exteriors will be brushed to remove any residues prior to the third and final rinse;

- After the third and final rinse, rinseate samples will be collected to verify effectiveness of the decontamination procedures. All rinseate samples will be analyzed for the parameters listed in the Action Plan.

- The rinsewater will be filtered and disposed on-site by deepwell injection.

All sumps, structures, and the thief pole rinsing system will be left in place for possible future use or salvage unless the rinseate samples indicate that the structures were not decontaminated adequately. In this case, the decontamination procedure will be repeated.

6.1.2 Schedule

It is estimated that this WMU will take approximately 6 weeks for closure. This will occur during weeks 3 through 8 of the closure period. Removal and disposal of material will take one week; decontamination will take three weeks; sampling and analysis of the rinseate will take two weeks.

This schedule assumes that only one round of sampling and analysis of the rinseate will be required. Therefore, only one decontamination will be required. This schedule also assumes that no soil sampling will be required.

6.1.3 Health and Safety Plan

Vickery maintains a site specific document regarding health and safety, emergency procedures and countermeasures. A site specific Contingency Plan is also maintained at the site. The Contingency Plan is part of the facility's Resource Conservation and Recovery Act Part B Permit and is modified as necessary to reflect changes in facility operations or regulatory requirements. The Contingency Plan is the basis for all health and safety procedures at the facility. Work-specific health and safety plans are typically based on this document. A typical health and safety plan for work at this facility is contained in Appendix C. All employees and visiting contractors are instructed about site specific hazards and emergency procedures prior to performing any work at the facility.

Hazards associated with closure of this WMU include exposure to the chemical constituents and caustic cleaners, as well as the hazards associated with working in an industrial area (i.e., tripping, falling equipment, overhead piping, heat stress, etc.) are reviewed. All personnel within the work area will be required to wear task appropriate personal protective equipment (gloves, hard hat, safety shoes, eye protection, protective clothing and respiratory protection) during closure.

6.1.4 Sampling and Analysis

As stated previously, Vickery will only collect soil samples if evidence of contamination exists. After decontamination, the sumps of the unloading bays and each sand interceptor vault (vault) will be visually inspected for cracks or other indications that the soil below the sump or vault may be contaminated. The grit filters will be removed in order to inspect the vault floor. If there is evidence of subsurface contamination, the sumps or the vault will be demolished and soil samples will be collected in accordance with Appendix B. If visibly stained soil is encountered, it will be

removed prior to collection of soil samples.

Soil samples will be collected from the sump bottom and from each side of the sump to a depth of 6 - 12". All grab samples will immediately be split down the middle with half being placed in sample containers for possible organics analysis. The remaining halves will be field screened using a PID or FID and then will be composited and analyzed for the inorganic parameters in the Action Plan. The sample (already containerized) from the location with the highest PID or FID reading will be analyzed for the organics listed in Action Plan. If soil sampling is necessary for the vaults, it will be performed in the same procedure as the sumps. The vault areas are small and shall be managed as one, discrete area. Soil samples will be collected from the bottom and from each side to a depth of 6 - 12".

If soil sampling indicates that contamination is present, then soil will be removed in an area extending two feet beyond the limits of the sump or vault in the direction of the contamination and soil samples will be collected in the same manner as previously described. This procedure will continue until soil contamination is at acceptable levels Action Plan.

6.2 Waste Receiving/Pre-Treatment Tanks (V-Tanks)

This WMU consists of four - 5,000 gallon FRP tanks (V-4 through V-7), set below grade in a 30' x 42' reinforced concrete vault. The vault is approximately 13' deep, with only 6" protruding above ground level. The vault is covered by a wooden frame structure that prevents rain from falling into the vault and possibly becoming contaminated. The V-Tanks are fed by the unloading sumps and grit filters in the unloading building. These tanks in turn feed the IAWTS Tanks. Each of the V-Tanks has a 16" PVC vent pipe which discharges to a waste gas scrubbing unit (This

scrubbing unit is regulated under the Clean Air Act and is not part of a RCRA Closure.). Figure 5 contains the general arrangement of the V-Tanks.

A solids handling unit that is located just east of the truck unloading building is also part of this WMU. This unit is used to handle solids collected by the grit filters. The solids handling unit is constructed of a reinforced concrete slab-on-grade with a containment curb.

6.2.1 Closure Procedures

The following closure procedures will be used to close the V-Tanks:

- Any liquid waste inventory will be transferred to the filtration and deepwell injection units for disposal. All other waste inventory will be transferred for off-site disposal at appropriate facilities;
- All empty containers and on-site treatment residues will be disposed off-site at appropriate facilities;
- Any tank residue will be removed and disposed of off-site. This may require confined space entry;
- The interior surfaces of the tanks, pipelines and containment vessels, will be triple-rinsed with a light caustic solution. The total volume of rinsewater needed is assumed to be equal to 10 percent of the working volume of the tanks;
- Pipeline exteriors will be brushed to remove residues prior to third and final rinsing;
- All sumps, concrete surfaces, pipe, fittings, etc. will be triple rinsed with a light caustic solution;
- After the third and final rinse, rinseate samples will be collected to verify effectiveness of the decontamination procedures. All rinseate samples will be analyzed for the parameters listed in Action Plan.

- The rinsewater will be filtered and disposed on-site by deepwell injection.

All sumps and structures will be left in place for possible future use or salvage unless the rinseate samples indicate that the structures were not decontaminated adequately. In this case, the decontamination procedure will be repeated.

6.2.2 Schedule

It is estimated that this WMU will take approximately 6 weeks for closure. This will occur during weeks 3 through 8 of the closure period. Removal and disposal of material will take one week; decontamination will take three weeks; sampling and analysis of the rinseate will take two weeks.

This schedule assumes that only one round of sampling and analysis of the rinseate will be required. Therefore, only one decontamination will be required. This schedule also assumes that no soil sampling will be required.

6.2.3 Health and Safety Plan

Vickery maintains a site specific document regarding health and safety, emergency procedures and countermeasures. A site specific Contingency Plan is also maintained at the site. The Contingency Plan is part of the facility's Resource Conservation and Recovery Act Part B Permit and is modified as necessary to reflect changes in facility operations or regulatory requirements. The Contingency Plan is the basis for all health and safety procedures at the facility. Work-specific health and safety plans are typically based on this document. A typical health and safety plan for work at this facility is contained in Appendix C. All employees and visiting contractors are instructed about site specific hazards and emergency procedures prior to performing any

work at the facility.

Hazards associated with closure of this WMU include exposure to the chemical constituents and caustic cleaners, as well as the hazards associated with working in an industrial area (i.e., tripping, falling equipment, overhead piping, heat stress, etc.) are reviewed. All personnel within the work area will be required to wear task appropriate personal protective equipment (gloves, hard hat, safety shoes, eye protection, protective clothing and respiratory protection) during closure.

6.2.4 Sampling and Analysis

As stated previously, Vickery will only collect soil samples if evidence of contamination exists. After decontamination, the sumps and containment area of the V-tanks will be visually inspected for cracks or other indications that soil contamination exists. If evidence of subsurface contamination exists, soil borings will be installed around the perimeter of the V-tank area as shown on Figure 5. Split spoon samples (2' length) will be collected from a depth of 13' to 15'. All grab samples will immediately be split down the middle with half being placed in sample containers for possible organics analysis. The remaining halves will be field screened with a PID or FID and then will be composited and analyzed for the inorganic parameters in the Action Plan. The sample (already containerized) from the location with the highest PID or FID reading will be analyzed for the organic constituents listed in the Action Plan.

In addition, a small, portable drill rig or similar device will be lowered to the floor of the V-Tanks vault and borings through the floor will be installed. The floor of the vault will be sectioned into grid equal to 1/4 of the total area. Two soil borings will be installed in each quadrant. Grab samples from each

quadrant will immediately split down the middle with half being placed in sample containers for possible organics analysis. The remaining halves will be field screened using a PID or FID and then will be composited and analyzed for the inorganic parameters in Action Plan. The sample (already containerized) from the location with the highest PID or FID reading will be analyzed for the organics listed in Action Plan.

6.2.5 Contingent Closure

In the event the facility demonstrates that not all contaminated soils can be practicably removed or decontaminated, the facility will perform a contingent closure of the contaminated soil. This will involve the following activities:

- The decontaminated tanks, associated piping and pumps will be removed and disposed;
- The concrete structure will be demolished;
- In addition to the soil samples previously taken, eight additional soil samples will be taken from areas surrounding the tank area;
- The area will be backfilled and compacted; and
- A cover shall be installed as specified in Appendix D.

6.3 Storage and Treatment Tanks (T-Tanks)

The Storage and Treatment Tanks (T-Tanks) are located as shown on the General Site Plan. Their working volumes and materials of construction are provided in Table 5-2. The T-Tanks designated as T-1, T-2, T-5, T-6, T-9, and T-10 are lined carbon steel tanks that sit on a 30" thick, reinforced concrete slab that has dimensions of 140' x 125' x with a 3.5' high peripheral walls, and sits on 90 ton piles. Ancillary equipment in the T-Tank area includes pumps and piping. The foundation and containment surfaces are coated with a

vinyl ester liner. Two sumps are located in the northwest and southeast corners of the containment area. The primary function of the T-Tanks is to produce a consistent wastestream for the injection system. The waste contents of each tank are mixed as necessary by recirculating the waste via a pump. The same pump can be used to transfer the liquid to other tanks. The recirculation and mixing capabilities are important functions of the IAWTS. A consistent wastestream is accomplished by: (1) maintaining the solids in suspension, to prevent blocking of pipes or pumps and enhance removal by filtration; (2) increased treatment rates and precipitant formation and (3) enhanced flow rate and flow volume control. A comprehensive system of pressure and flow sensors and electronic process instrumentation controls the process. Figure 3 shows the general layout of the T-Tanks.

6.3.1 Closure Procedures

The following closure procedures will be used to close the T-Tanks:

- Any liquid waste inventory will be transferred to the filtration and deepwell injection units for disposal. All other waste inventory will be transferred for off-site disposal at appropriate facilities;
- All empty containers and on-site treatment residues will be disposed off-site at appropriate facilities;
- Any tank residue will be removed and disposed of off-site. This may require confined space entry;
- The interior surfaces of the tanks, pipelines and containment vessels, will be triple-rinsed with a light caustic) solution. The total volume of rinsewater needed is assumed to be equal to 10 percent of the working volume of the tanks;
- Pipeline exteriors will be brushed to remove residues prior to the third and final rinsing;

- All sumps, concrete surfaces, pipe, fittings, etc. will be triple rinsed with a light caustic solution;

- After the third and final rinse, rinseate samples will be collected to verify effectiveness of the decontamination procedures. All rinseate samples will be analyzed for the parameters listed in Action Plan.

- The rinsewater will be filtered and disposed on-site by deepwell injection.

All sumps and structures will be left in place for possible future use or salvage unless the rinseate samples indicate that the structures were not decontaminated adequately. In this case, the decontamination procedure will be repeated.

6.3.2 Schedule

It is estimated that this WMU will take approximately 6 weeks for closure. This will occur during weeks 3 through 8 of the closure period. Removal and disposal of material will take one week; decontamination will take three weeks; sampling and analysis of the rinseate will take two weeks.

This schedule assumes that only one round of sampling and analysis of the rinseate will be required. Therefore, only one decontamination will be required. This schedule also assumes that no soil sampling will be required.

6.3.3 Health and Safety Plan

Vickery maintains a site specific document regarding health and safety, emergency procedures and countermeasures. A site specific Contingency Plan is also maintained at the site. The Contingency Plan is part of the facility's Resource Conservation and Recovery Act Part B Permit and is modified as necessary to reflect changes in facility operations or regulatory requirements. The Contingency Plan is the basis for all health and safety

procedures at the facility. Work-specific health and safety plans are typically based on this document. A typical health and safety plan for work at this facility is contained in Appendix C. All employees and visiting contractors are instructed about site specific hazards and emergency procedures prior to performing any work at the facility.

Hazards associated with closure of this WMU include exposure to the chemical constituents and caustic cleaners, as well as the hazards associated with working in an industrial area (i.e., tripping, falling equipment, overhead piping, heat stress, etc.) are reviewed. All personnel within the work area will be required to wear task appropriate personal protective equipment (gloves, hard hat, safety shoes, eye protection, protective clothing and respiratory protection) during closure.

6.3.4 Sampling and Analysis

The T-Tanks were installed during 1988. The secondary containment system meets current OEPA standards and there have not been any reported leaks. Therefore sampling and analysis of the area near the T-Tanks would not be necessary. An investigation of the T-tank farm will not be necessary unless the containment area affected by a spill is not free of cracks and gaps.

6.4 Filtered Acid Tanks

Filtered Acid Tanks (FATs) are double walled, fiberglass reinforced plastic tanks. The volumes of these tanks, designated as T-700 (FAT-AR), T-300 (FAT-3R), and T-500 (FAT-5R) are provided in Table 5-2. These tanks are located within concrete containment areas that vary in size depending on the FAT capacity. The containment areas are constructed of reinforced concrete and are between 625 ft^2 for FAT 1, to 961 ft^2 for FAT 3. The locations of

the FATs are shown on the General Site Plan (Figure 2). Figure 6 contains a general arrangement of the FATs.

The function of FATs is to act as surge tanks for the injection pumps. These tanks store treated wastewater prior to injection into the deepwell system.

6.4.1 Cleaning Procedures

The following procedures will be used to close the FATs:

- The FAT contents will be piped through the guard filters and disposed of in the injection wells;
- Any tank residue will be removed and disposed of off-site;
- The tanks, pipelines and containment vessels, will be triple-rinsed with a light caustic solution. The total volume of rinsewater needed is assumed to be equal to 10 percent of the working volume of the tanks;
- Pipeline exteriors will be brushed to remove residues prior to third and final rinsing;
- After the third and final rinse, rinseate samples will be collected to verify effectiveness of the decontamination procedures. All rinseate samples will be analyzed for the parameters listed in Action Plan (Table 4-3 for FAT 1 and 2).
- The rinsewater will be filtered and disposed on-site by deepwell injection.

All sumps and structures will be left in place for possible future use or salvage unless the rinseate samples indicate that the structures were not decontaminated adequately. In this case, the decontamination procedure will be repeated.

6.4.2 Schedule

It is estimated that closure of these units will take six

weeks. Inventory removal and disposal will disposal will take one week; decontamination will take two weeks; sampling and analysis of the rinseate will take two weeks; and certification will take one week.

This schedule assumes that only one round of sampling and analysis of the rinseate will be required and therefore only one decontamination will be required.

6.4.3 Health and Safety Plan

Vickery maintains a site specific document regarding health and safety, emergency procedures and countermeasures. A site specific Contingency Plan is also maintained at the site. The Contingency Plan is part of the facility's Resource Conservation and Recovery Act Part B Permit and is modified as necessary to reflect changes in facility operations or regulatory requirements.

The Contingency Plan is the basis for all health and safety procedures at the facility. Work-specific health and safety plans are typically based on this document. A typical health and safety plan for work at this facility is contained in Appendix C. All employees and visiting contractors are instructed about site specific hazards and emergency procedures prior to performing any work at the facility.

Hazards associated with closure of this WMU include exposure to the chemical constituents and caustic cleaners, as well as the hazards associated with working in an industrial area (i.e., tripping, falling equipment, overhead piping, heat stress, etc.) are reviewed. All personnel within the work area will be required to wear task appropriate personal protective equipment (gloves, hard hat, safety shoes, eye protection, protective clothing and respiratory protection) during closure.

6.4.4 Sampling and Analysis

As stated previously, Vickery will only collect soil samples if evidence of contamination exists. After decontamination of the FAT and containment area, the containment area will be inspected for cracks or other indications that soil contamination is possible. If evidence of subsurface contamination exists, soil samples will be collected using the plan described in the following paragraphs.

A grid around the containment area will be developed. The size of the grid will extend 5 feet beyond the limits of the containment area. This area will be divided into four sections equal to 1/4 of the total area unless the grid overlaps on existing containment or concrete structure sampling will be done on the exposed soil in the grid. Figure 7 contains a typical grid. Four borings will be constructed within each quadrant and soil samples will be collected from a depth of 0 - 2' below the concrete pad. Each quadrant shall be sampled and analyzed independent of other quandrants. As described below, an organic and a composite inorganic sample will be produced from each quandrant. All grab samples will immediately be split down the middle with half being placed in sample containers for possible organics analysis. The remaining halves will be field screened with a PID or FID and then will be composited and analyzed for the inorganic parameters in the Action Plan. The sample (already containerized) from the location with the highest PID or FID reading will be analyzed for the organics listed in the Action Plan.

If contamination is detected, the contaminated quadrant area will be demolished and soil from the contaminated quadrant(s) will be removed. Confirmatory samples will be collected from the sides and bottom of the excavation and analyzed in the same manner as previously described.

6.4.5 Contingent Closure (Containments 1, 2, 3, 5, A & B)

In the event the facility demonstrates that not all contaminated soils can be practicably removed or decontaminated, the facility will perform a contingent closure of the contaminated soil. This will involve the following activities:

- The decontaminated tanks and associated piping will be removed and disposed;
- The concrete structures will be demolished;
- In addition to the soil samples previously taken, four additional soil samples will be taken from areas surrounding each tank area;
- The areas will be backfilled and compacted; and
- A cover shall be installed as specified in Appendix D.

6.5 Filter Buildings

Two filter buildings are part of the IAWTS. Filter Building No. 1 is a one story, steel frame building with steel siding, set on a reinforced concrete slab-on-grade which houses two pressure leaf filters. The floor of the building contains a concrete curb around the inside wall of the building. The floor is also sloped toward a sump equipped with a secondary PVC liner and pump. This building contains two, 36 ft^3 pressure leaf filters, two small mixing tanks (used to formulate the slurry used to coat the filter press) several transfer pumps and piping. The western wall of the building contains a control panel and electrical switch gear. This building services FAT A and FAT B. Figure 8 contains a general layout of the filter building.

Filter Building No. 2 is also a single story, steel framed building with steel panel siding and roofing, resting on a reinforced concrete slab-on-grade. The slab has a perimeter

containment curb, elevated equipment pads and a corrosion resistant coating. The filter press in this building is a 70-ft^3 unit.

6.5.1 Closure Procedures

The following closure procedures will be used to close the Filter Buildings:

- Any liquid waste inventory will be transferred to the filtration and deepwell injection units for disposal. All other waste inventory will be transferred for off-site disposal at appropriate facilities;
- All empty containers and onsite treatment residues will be disposed off-site at appropriate facilities;
- The filter presses, tanks, pipelines and containment vessels, will be triple-rinsed with a light caustic solution. The total volume of rinsewater needed is assumed to be equal to 10 percent of the working volume of the tanks;
- After the third and final rinse, rinseate samples will be collected to verify effectiveness of the decontamination procedures. All rinseate samples will be analyzed for the parameters listed in Action Plan.
- The rinsewater will be filtered and disposed on-site by deepwell injection.

All sumps and structures will be left in place for possible future use or salvage unless the rinseate samples indicate that the structures were not decontaminated adequately. In this case, the decontamination procedure will be repeated.

6.5.2 Schedule

It is estimated that closure of these units will take four weeks. Inventory removal and disposal will disposal will take one week; decontamination will take one week; sampling and analysis of the rinseate will take two weeks; and certification will take

one week.

This schedule assumes that only one round of sampling and analysis of the rinseate will be required and therefore only one decontamination will be required.

6.5.3 Health and Safety Plan

Vickery maintains a site specific document regarding health and safety, emergency procedures and countermeasures. A site specific Contingency Plan is also maintained at the site. The Contingency Plan is part of the facility's Resource Conservation and Recovery Act Part B Permit and is modified as necessary to reflect changes in facility operations or regulatory requirements. The Contingency Plan is the basis for all health and safety procedures at the facility. Work-specific health and safety plans are typically based on this document. A typical health and safety plan for work at this facility is contained in Appendix C. All employees and visiting contractors are instructed about site specific hazards and emergency procedures prior to performing any work at the facility.

Hazards associated with closure of this WMU include exposure to the chemical constituents and caustic cleaners, as well as the hazards associated with working in an industrial area (i.e., tripping, falling equipment, overhead piping, heat stress, etc.) are reviewed. All personnel within the work area will be required to wear task appropriate personal protective equipment (gloves, hard hat, safety shoes, eye protection, protective clothing and respiratory protection) during closure.

6.5.4 Sampling and Analysis

As stated previously, Vickery will only collect soil samples

if evidence of contamination exists after decontamination of the filter buildings. The floor, sumps and containment areas will be visually inspected for cracks or other indications that soil contamination is possible. If there is evidence of subsurface contamination, soil samples will be collected using the plan described in the following paragraphs.

The sump will be removed and demolished. If visible stained soil is encountered, it will be removed prior to soil sample collection. Grab soil samples will be collected from all four sides of the sump and from the sump bottom. All grab samples will immediately be split down the middle with half being placed in sample containers for possible organics analysis. The remaining halves will be field screened with a PID or FID and then will be composited and analyzed for the inorganic parameters in the Action Plan. The sample (already containerized) from the location with the highest PID or FID reading will be analyzed for the organics listed in the Action Plan.

If the sampling results indicate contamination from the sump, soil will be removed from and area extending 2' beyond the sump area in the direction of the contamination and confirmatory samples will be collected in the same manner as previously described.

In addition to sampling the sump area, a grid around the containment will be developed. The size of the grid will extend 5 feet beyond the limits of the containment area unless the grid overlaps on existing containment or concrete structure sampling will be done on the exposed soil in the grid. This area will be divided into four sections equal to 1/4 of the total area. Figure 8 contains a typical grid. Four borings will be constructed within each quadrant and soil samples will be collected from a depth of 0 - 2 feet below the concrete pad. Each quadrant shall be sampled

and analyzed independent of other quandrants. As described below, an organic and a composite inorganic sample will be produced from each quandrant. All grab samples will immediately be split down the middle with half being placed in sample containers for possible organics analysis. The remaining halves will be field screened with a PID or FID and then will be composited and analyzed for the inorganic parameters in the Action Plan. The sample (already containerized) from the location with the highest PID or FID reading will be analyzed for the organics listed in the Action Plan.

If contamination is detected, the containment area will be demolished and soil from the contaminated quadrant(s) will be removed. Confirmatory samples will be collected from the sides and bottom of the excavation and analyzed in the same manner as previously described.

6.5.5 PROPOSED FILTER BUILDING

The proposed filter press building is a single story, concrete masonry building, 90'-8" by 50'-8" and will reside on a reinforced concrete slab-on-grade. A general building layout is shown in Figure 11. The slab will be constructed with a perimeter containment curb, elevated equipment pads and a corrosion resistant coating. The ceiling will contain a joist system with two attached monorails, one over each filter press.

Two 70-ft^3 pressure leaf filter units will be located in the southwestern portion of the building. The machines will be elevated approximately 9 feet above the floor. An equipment platform will surround the machinery and provide access to the elevated Electrical and Motor Control Room, located in the southeastern portion of the building.

A Water Storage Tank, Chemical Mix Tank, and Ad Mix Solution Tank will be situated in the northern portion of the building. The building will be divided into three sections. The floor of each section will be sloped toward a sump equipped with a secondary PVC liner and pump. A Bulk Dry Storage Silo is located outside the western portion of the north wall. A corridor will lead from this building to the existing T Tank Pumphouse Building.

6.5.5.1 Closure Procedures

The following closure procedures will be used to close the proposed Filter Press Building:

- Any liquid waste inventory will be transferred to the filtration and deepwell injection units for disposal. All other waste inventory will be transferred for off-site disposal at appropriate facilities;
- All product storage and chemical mix tanks will be emptied. All empty containers and onsite treatment residues will be disposed off-site at appropriate facilities;
- The filter presses, tanks, pipelines and containment vessels, floors, and sumps in contact with waste will be triple-rinsed with a light caustic solution. The total volume of rinsewater needed is assumed to be equal to 10 percent of the working volume of the tanks;
- After the third and final rinse, rinseate samples will be collected to verify effectiveness of the decontamination procedures. All rinseate samples will be analyzed for the parameters listed in the Action Plan.
- The rinsewater will be filtered and disposed on-site by deepwell injection.

All sumps and structures will be left in place for possible future use or salvage unless the rinseate samples indicate that the structures were not decontaminated adequately. In this case, the decontamination procedure will be repeated.

6.5.5.2 Schedule

It is estimated that closure of these units will take four weeks. Inventory removal and disposal will take one week; decontamination will take one week; sampling and analysis of the rinseate will take two weeks; and certification will take one week.

This schedule assumes that only one round of sampling and analysis of the rinseate will be required and therefore only one decontamination will be required.

6.5.5.3 Health and Safety Plan

Vickery maintains a site specific document regarding health and safety, emergency procedures and countermeasures. A site specific Contingency Plan is also maintained at the site. The Contingency Plan is part of the facility's Resource Conservation and Recovery Act Part B Permit and is modified as necessary to reflect changes in facility operations or regulatory requirements. The Contingency Plan is the basis for all health and safety procedures at the facility. Work-specific health and safety plans are typically based on this document. A typical health and safety plan for work at this facility is contained in Appendix C. All employees and visiting contractors are instructed about site specific hazards and emergency procedures prior to performing any work at the facility.

Hazards associated with closure of this WMU include exposure to the chemical constituents and caustic cleaners, as well as the hazards associated with working in an industrial area (i.e., tripping, falling equipment, overhead piping, heat stress, etc.) are reviewed. All personnel within the work area will be required to wear task appropriate personal protective equipment (gloves, hard hat, safety shoes, eye protection, protective clothing and

respiratory protection) as required during closure.

6.5.5.4 Sampling and Analysis

As stated previously, Vickery will only collect soil samples if evidence of contamination exists after decontamination of the proposed filter building. The floor, sumps and containment areas will be visually inspected for cracks or other indications that soil contamination is possible. If there is evidence of subsurface contamination, soil samples will be collected using the plan described in the following paragraphs.

The sump will be removed and demolished. If visible stained soil is encountered, it will be removed prior to soil sample collection. Grab soil samples will be collected from all four sides of the sump and from the sump bottom. All grab samples will immediately be split down the middle with half being placed in sample containers for possible organics analysis. The remaining halves will be field screened using a PID or FID and then will be composited and analyzed for the inorganic parameters in the Action Plan. The sample (already containerized) from the location with the highest PID or FID reading will be analyzed for the organics listed in the Action Plan.

If the sampling results indicate contamination from the sump, soil will be removed from an area extending 2' beyond the sump area in the direction of the contamination and confirmatory samples will be collected in the same manner as previously described.

In addition to sampling the sump area, a grid around the containment will be developed. The size of the grid will extend 5 feet beyond the limits of the containment area unless the grid overlaps on existing containment or concrete structure sampling will be done on the exposed soil in the grid. This area will be

divided into four sections equal to 1/4 of the total area. Figure 8 contains a typical grid. Four borings will be taken within each quadrant and soil samples will be collected from a depth of 0 - 2 feet below the elevation of the concrete pad. Each quadrant shall be sampled and analyzed independent of other quandrants. As described below, an organic and a composite inorganic sample will be produced from each quandrant. All grab samples will immediately be split down the middle with half being placed in sample containers for possible organics analysis. The remaining halves will be field screened using a PID or FID and then will be composited and analyzed for the inorganic parameters in the Action Plan. The sample (already containerized) from the location with the highest PID or FID reading will be analyzed for the organics listed in the Action Plan.

If contamination is detected, the containment area will be demolished and soil from the contaminated quadrant(s) will be removed. Confirmatory samples will be collected from the sides and bottom of the excavation and analyzed in the same manner as previously described.

6.6 Pump House

The Pump House which serves the T-Tanks is located as shown on Figure 1. This pump house contains all the recirculation and discharge pumps for the IAWTS. The steel frame building is insulated and supported on a 3.5' concrete wall which sets on a 30" concrete pad supported by piers. The walls and floor of the pump house are lined with a corrosion resistant material. Any spillage inside the containment drains to sumps located at the north and south ends of the pump house.

6.6.1 Closure Procedures

The following closure procedures will be used to close the Pump House:

- Remove any collected spillage and dispose in on-site injection wells;
- Remove any solids from the sump and dispose off-site;
- Clean the floors, walls, sump, pipes, pumps, ancillary equipment and containment area by high-pressure spraying with a light caustic solution;
- After the third and final rinse, rinseate samples will be collected to verify effectiveness of the decontamination procedures. All rinseate samples will be analyzed for the parameters listed in Action Plan.
- The rinsewater will be filtered and disposed on-site by deepwell injection.

All sumps and structures will be left in place for possible future use or salvage unless the rinseate samples indicate that the structures were not decontaminated adequately. In this case, the decontamination procedure will be repeated.

6.6.2 Schedule

It is estimated that closure of these units will take four weeks. Inventory removal and disposal will disposal will take one week; decontamination will take one week; sampling and analysis of the rinseate will take two weeks; and certification will take one week.

This schedule assumes that only one round of sampling and analysis of the rinseate will be required and therefore only one decontamination will be required.

6.6.3 Health and Safety Plan

Vickery maintains a site specific document regarding health

and safety, emergency procedures and countermeasures. A site specific Contingency Plan is also maintained at the site. The Contingency Plan is part of the facility's Resource Conservation and Recovery Act Part B Permit and is modified as necessary to reflect changes in facility operations or regulatory requirements. The Contingency Plan is the basis for all health and safety procedures at the facility. Work-specific health and safety plans are typically based on this document. A typical health and safety plan for work at this facility is contained in Appendix C. All employees and visiting contractors are instructed about site specific hazards and emergency procedures prior to performing any work at the facility.

Hazards associated with closure of this WMU include exposure to the chemical constituents and caustic cleaners, as well as the hazards associated with working in an industrial area (i.e., tripping, falling equipment, overhead piping, heat stress, etc.) are reviewed. All personnel within the work area will be required to wear task appropriate personal protective equipment (gloves, hard hat, safety shoes, eye protection, protective clothing and respiratory protection) during closure.

6.6.4 Sampling and Analysis

As stated previously, Vickery will only collect soil samples if evidence of contamination exists after decontamination. The pump house floor, sumps and containment areas will be visually inspected for cracks or other indications that soil contamination exists. If soil contamination exists, soil samples will be collected using the plan described in the following paragraphs.

The sump will be removed and demolished. If visibly stained soil is encountered, it will be removed prior to sample collection. Grab soil samples will be collected from all four sides of the sump

and from the sump bottom. All grab samples will immediately be split down the middle with half being placed in sample containers for possible organics analysis. The remaining halves will be field screened using a PID or FID and then will be composited and analyzed for the inorganic parameters in the Action Plan. The sample (already containerized) from the location with the highest PID or FID reading will be analyzed for the organics listed in the Action Plan.

If the sampling results indicate contamination from the sump, soil will be removed from and area extending 2' beyond the sump area in the direction of the contamination and confirmatory samples will be collected in the same manner as previously described.

In addition to sampling the sump area, a grid around the containment will be developed. The size of the grid will extend 5 feet beyond the limits of the containment area. This area will be divided into four sections equal to 1/4 of the total area. Figure 9 contains a typical grid. Four borings will be constructed within each quadrant and soil samples will be collected from a depth of 0 - 2 feet below the concrete pad. Each quadrant shall be sampled and analyzed independent of other quandrants. As described below, an organic and a composite inorganic sample will be produced from each quandrant. All samples will immediately be split down the middle with half being placed in sample containers for possible organics analysis. The remaining halves will be field screened using a PID or FID and then will be composited and analyzed for the inorganic parameters in the Action Plan. The sample (already containerized) from the location with the highest PID or FID reading will be analyzed for the organics listed in the Action Plan.

If contamination is detected, the containment area will be

demolished and soil from the contaminated quadrant(s) will be removed. Confirmatory samples will be collected from the sides and bottom of the excavation and analyzed in the same manner as previously described.

6.7 Injection Well Pump Houses

The four deep injection wells (IW) are served by four pump houses; Pump House No. 2 serves IW-4, Pump House No. 3 serves IW-2, Pump House No. 5 serves IW-5 and Pump House No. 1 serves IW-6. Each Pump house is a steel framed building with steel panel siding and roofing, set atop a reinforced concrete slab-on-grade. The concrete slab has a curb all around the edge, and the sumps and equipment are all set on concrete pads of at least curb height. The surfaces of the slab, curb, and pads are all coated with a corrosion resistant material.

6.7.1 Closure Procedures

The following closure procedures will be used to close the Injection Well Pump Houses:

- Clean the floors, pumps, pipes, ancillary equipment, walls, sump and containment area by high-pressure spraying with a light caustic solution;
- After the third and final rinse, rinseate samples will be collected to verify effectiveness of the decontamination procedures. All rinseate samples will be analyzed for the parameters listed in Action Plan.
- The rinsewater will be filtered and disposed on-site by deepwell injection.

All sumps and structures will be left in place for possible future use or salvage unless the rinseate samples indicate that the structures were not decontaminated adequately. In this case, the decontamination procedure will be repeated.

6.7.2 Schedule

It is estimated that closure of these units will take four weeks. Inventory removal and disposal will disposal will take one week; decontamination will take one week; sampling and analysis of the rinseate will take two weeks; and certification will take one week.

This schedule assumes that only one round of sampling and analysis of the rinseate will be required and therefore only one decontamination will be required.

6.7.3 Health and Safety Plan

Vickery maintains a site specific document regarding health and safety, emergency procedures and countermeasures. A site specific Contingency Plan is also maintained at the site. The Contingency Plan is part of the facility's Resource Conservation and Recovery Act Part B Permit and is modified as necessary to reflect changes in facility operations or regulatory requirements. The Contingency Plan is the basis for all health and safety procedures at the facility. Work-specific health and safety plans are typically based on this document. A typical health and safety plan for work at this facility is contained in Appendix C. All employees and visiting contractors are instructed about site specific hazards and emergency procedures prior to performing any work at the facility.

Hazards associated with closure of this WMU include exposure to the chemical constituents and caustic cleaners, as well as the hazards associated with working in an industrial area (i.e., tripping, falling equipment, overhead piping, heat stress, etc.) are reviewed. All personnel within the work area will be required to wear task appropriate personal protective equipment (gloves,

hard hat, safety shoes, eye protection, protective clothing and respiratory protection) during closure.

6.7.4 Sampling and Analysis

As stated previously, Vickery will only collect soil samples if evidence of contamination exists after decontamination. The pump house buildings, the floor, sumps and containment areas will be visually inspected for cracks or other indications that soil contamination exists. If soil contamination exists, soil samples will be collected using the plan described in the following paragraphs.

The sump will be removed and demolished. If visibly contaminated soil is encountered, it will be removed prior to soil sample collection. Grab soil samples will be collected from all four sides of the sump and from the sump bottom. All grab samples will immediately be split down the middle with half being placed in sample containers for possible organics analysis. The remaining halves will be field screened using a PID or FID and then will be composited and analyzed for the inorganic parameters in the Action Plan. The sample (already containerized) from the location with the highest PID or FID reading will be analyzed for the organics listed in the Action Plan.

If the sampling results indicate contamination from the sump, soil will be removed from and area extending 2' beyond the sump area in the direction of the contamination and confirmatory samples will be collected in the same manner as previously described.

In addition to sampling the sump area, a grid around the containment will be developed. The size of the grid will extend 5 feet beyond the limits of the containment area. This area will be divided into four sections equal to 1/4 of the total area. Figure

10 contains a typical grid. Four borings will be constructed within each quadrant and soil samples will be collected from a depth of 0 - 2 feet below the concrete pad. Each quadrant shall be sampled and analyzed independent of other quandrants. As described below, an organic and a composite inorganic sample will be produced from each quandrant. All grab samples will immediately be split down the middle with half being placed in sample containers for possible organics analysis. The remaining halves will be field screened using a PID or FID and then will be composited and analyzed for the inorganic parameters in the Action Plan. The sample (already containerized) from the location with the highest PID or FID reading will be analyzed for the organics listed in the Action Plan.

If contamination is detected, the containment area will be demolished and soil from the contaminated quadrant(s) will be removed. Confirmatory samples will be collected from the sides and bottom of the excavation and analyzed in the same manner as previously described.

6.8 Transfer Pipelines

Piping and fittings of the IAWTS are primarily rigid Polyvinylchloride (PVC or CPVC) with a limited use of Fiberglass reinforced Plastic (FRP). Flanged and gasketed joints are provided at all valves, tank connections and some intermediate points to allow easy disassembly and repair. All pipes are supported by above-ground racks, approximately 3.5' above grade. This includes stretches from the filter building to the pump house and the T-Tanks. The pipelines northeast of the Filter Building No. 1 are raised on a bridge approximately 16' 8" above the road surface.

Also included with the transfer pipelines are emergency management tanks (EMTs). These tanks allow Vickery to divert flow

from the IAWTS Transfer Pipelines in case of an emergency. Each tank is approximately 250 gallons.

6.8.1 Closure Procedures

The following closure procedures will be used to close the Transfer Pipelines and the EMTs:

- The tanks, pipelines and containment vessels, will be triple-rinsed with a light caustic solution. The total volume of rinsewater needed is assumed to be equal to 10 percent of the working volume of the tanks;
- Pipeline exteriors will be brushed to remove residues prior to third and final rinsing;
- After the third and final rinse, rinseate samples will be collected to verify effectiveness of the decontamination procedures. All rinseate samples will be analyzed for the parameters listed in Action Plan.
- The rinsewater will be filtered and disposed on-site by deepwell injection.

6.8.2 Schedule

It is estimated that closure of these units will take four weeks. This schedule assumes that only one round of sampling and analysis of the rinseate will be required and therefore only one decontamination will be required.

6.8.3 Health and Safety Plan

Vickery maintains a site specific document regarding health and safety, emergency procedures and countermeasures. A site specific Contingency Plan is also maintained at the site. The Contingency Plan is part of the facility's Resource Conservation and Recovery Act Part B Permit and is modified as necessary to reflect changes in facility operations or regulatory requirements. The Contingency Plan is the basis for all health and safety

procedures at the facility. Work-specific health and safety plans are typically based on this document. A typical health and safety plan for work at this facility is contained in Appendix C. All employees and visiting contractors are instructed about site specific hazards and emergency procedures prior to performing any work at the facility.

Hazards associated with closure of this WMU include exposure to the chemical constituents and caustic cleaners, as well as the hazards associated with working in an industrial area (i.e., tripping, falling equipment, overhead piping, heat stress, etc.) are reviewed. All personnel within the work area will be required to wear task appropriate personal protective equipment (gloves, hard hat, safety shoes, eye protection, protective clothing and respiratory protection) during closure.

6.8.4 Sampling and Analysis

As stated previously, Vickery will only collect soil samples if evidence of contaminated soil exists or if documented spills have occurred. After decontamination of the transfer pipelines has been verified, soil samples will be collected from pipeline areas where documented leaks have occurred, as described below.

A soil sample will be collected at each area which had evidence of contaminated soil or where a spill occurred. All samples will be collected from the 0 - 24" interval and analyzed for the parameters listed in Action Plan.

If contamination is encountered, soil will be excavated in an area extending 5 feet in all directions from the area of the spill. Confirmatory samples will be collected from all sides and the bottom of the excavated area. All grab samples will immediately be split down the middle with half being placed in sample containers

for possible organics analysis. The remaining halves will be field screened using a PID or FID and then will be composited and analyzed for the inorganic parameters in the Action Plan. The sample (already containerized) from the location with the highest PID or FID reading will be analyzed for the organics listed in the Action Plan. This process will continue until cleanup levels are achieved.

6.9 Laboratory Tank

The Laboratory Tank is a 2,500 gallon, high density polyethylene, storage tank located near the laboratory building in a 9' x 9' x 9' reinforced concrete vault which is lined with a PVC one piece liner to the height of 7'. The vault has a steel cover. The tank was installed in 1994. The primary function of the tank is to collect and store reagent and chemical wastes from the on site laboratory. The contents of the tank are disposed in the same manner as other wastes at the site.

6.9.1 Closure Procedures

The following closure procedures will be used to close the Laboratory Tank:

- Any liquid waste inventory will be transferred to the filtration and deepwell injection units for disposal.
- The tank will be triple-rinsed with a light caustic solution. The total volume of rinsewater needed is assumed to be equal to 10 percent of the working volume of the tank;
- The vault will be triple-rinsed with a light caustic solution. The total volume of rinsewater needed is assumed to be equal to 10 percent of the working volume of the tank;
- Pipeline exteriors will be brushed to remove residues prior to third and final rinsing;

- After the third and final rinse, rinseate samples will be collected to verify effectiveness of the decontamination procedures. All rinseate samples will be analyzed for the parameters listed in Action Plan.

- The rinsewater will be filtered and disposed on-site by deepwell injection.

6.9.2 Schedule

It is estimated that closure of this units will take four weeks. This schedule assumes that only one round of sampling and analysis of the rinseate will be required and therefore only one decontamination will be required.

6.9.3 Health and Safety Plan

Vickery maintains a site specific document regarding health and safety, emergency procedures and countermeasures. A site specific Contingency Plan is also maintained at the site. The Contingency Plan is part of the facility's Resource Conservation and Recovery Act Part B Permit and is modified as necessary to reflect changes in facility operations or regulatory requirements. The Contingency Plan is the basis for all health and safety procedures at the facility. Work-specific health and safety plans are typically based on this document. A typical health and safety plan for work at this facility is contained in Appendix C. All employees and visiting contractors are instructed about site specific hazards and emergency procedures prior to performing any work at the facility.

Hazards associated with closure of this WMU include exposure to the chemical constituents and caustic cleaners, as well as the hazards associated with working in an industrial area (i.e., tripping, falling equipment, overhead piping, heat stress, etc.) are reviewed. All personnel within the work area will be required to wear task appropriate personal protective equipment (gloves,

hard hat, safety shoes, eye protection, protective clothing and respiratory protection) during closure.

6.9.4 Sampling and Analysis

As stated previously, Vickery will only collect soil samples if evidence of contamination exists. After decontamination, the concrete vault will be inspected for cracks or other indications that the soil below the tank may be contaminated. If there is contamination, the vault will be removed and soil samples will be collected in accordance with Appendix B. If any visibly contaminated soil is encountered, it will be remove prior to soil sample collection.

Soil samples will be collected from the vault excavation bottom and from each side of the excavation to a depth of 6 - 12". All grab samples will immediately be split down the middle with half being placed in sample containers for possible organics analysis. The remaining halves will be field screened using a PID or FID and then will be composited and analyzed for the inorganic parameters in the Action Plan. The sample (already containerized) from the location with the highest PID or FID reading will be analyzed for the organics listed in the Action Plan.

If the sampling results indicated contamination, soil will be removed from and area extending 2' beyond the vault area in the direction of the contamination and confirmatory samples will be collected in the same manner as previously described.

6.10 Receiving Truck Bay

The Receiving Truck Bay is located at the main gate area on the southern portion of the facility. Access to the area is from State Route 412. It consists of a reinforced concrete pad with a

containment curb, a sample station and is covered by a steel roof. It is open on all sides. All incoming and outgoing traffic passes through this area for weighing and security measures. A sump, located in the center of the area collects any drainage.

6.10.1 Closure Procedures

The following closure procedures will be used to close the Receiving Truck Bay:

- Remove any collected precipitation from the sump and dispose in on-site injection wells;
- Remove any solids from the sump and dispose off-site;
- Clean the bay, sample station and sump area by high-pressure spraying with a light caustic solution;
- Rinse sump, sample station and bay with high-pressure water spray;
- After the third and final rinse, rinseate samples will be collected to verify effectiveness of the decontamination procedures. All rinseate samples will be analyzed for the parameters listed in Action Plan.
- The rinsewater will be filtered and disposed on-site by deepwell injection.

All sumps and structures will be left in place for possible future use or salvage unless the rinseate samples indicate that the structures were not decontaminated adequately. In this case, the decontamination procedure will be repeated.

6.10.2 Schedule

It is estimated that closure of these units will take two weeks and occur during the general facility closure.

This schedule assumes that only one round of sampling and

analysis of the rinseate will be required and therefore only one decontamination will be required.

6.10.3 Health and Safety Plan

Vickery maintains a site specific document regarding health and safety, emergency procedures and countermeasures. A site specific Contingency Plan is also maintained at the site. The Contingency Plan is part of the facility's Resource Conservation and Recovery Act Part B Permit and is modified as necessary to reflect changes in facility operations or regulatory requirements. The Contingency Plan is the basis for all health and safety procedures at the facility. Work-specific health and safety plans are typically based on this document. A typical health and safety plan for work at this facility is contained in Appendix C. All employees and visiting contractors are instructed about site specific hazards and emergency procedures prior to performing any work at the facility.

Hazards associated with closure of this WMU include exposure to the chemical constituents and caustic cleaners, as well as the hazards associated with working in an industrial area (i.e., tripping, falling equipment, overhead piping, heat stress, etc.) are reviewed. All personnel within the work area will be required to wear task appropriate personal protective equipment (gloves, hard hat, safety shoes, eye protection, protective clothing and respiratory protection) during closure.

6.10.4 Sampling and Analysis

As stated previously, Vickery will only collect soil samples if evidence of contamination exists. After decontamination, the sumps and containment area surface will be visually inspected for cracks or other indications that the soil below the sump may be

contaminated. If there is contamination, the sumps will be demolished and soil samples will be collected in accordance with Appendix B. If any visibly contaminated soil is encountered, it will be remove prior to soil sample collection.

Soil samples will be collected from the sump bottom and from each side of the sump to a depth of 6 - 12". All grab samples will immediately be split down the middle with half being placed in sample containers for possible organics analysis. The remaining halves will be field screened using a PID or FID and then will be composited and analyzed for the inorganic parameters in the Action Plan. The sample (already containerized) from the location with the highest PID or FID reading will be analyzed for the organics listed in the Action Plan.

If the sampling results indicate contamination from the sump, soil will be removed from and area extending 2' beyond the sump area in the direction of the contamination and confirmatory samples will be collected in the same manner as previously described.

6.11 INJECTION WELL HOUSE

The four deep injection wells (IW) are each contained in a 10 ft. by 10 ft. plastic frame house. A fiberglass floor intercepts drips and spills from the pressurized injection system. Each house contains pressurized, diesel fuel, storage tank, the well head, and associated piping connecting each well to its respective pump house. The housing maintains a removable roof, which allows for annual MIT testing. Injection well houses do not contain sumps. Locations for the injection well houses are shown on the General Site Plan (see Figure 2).

6.11.1 Closure Procedures

The following closure procedures will be used to close the Injection Well Houses:

- The floors and walls will be triple-rinsed with a light caustic solution;
- The diesel fuel storage tank will be emptied and removed.
- After the third and final rinse, rinseate samples will be collected to verify effectiveness of the decontamination procedures. All rinseate samples will be analyzed for the parameters listed in Action Plan.
- The rinsewater will be filtered and disposed on-site by deepwell injection.

All structures will be left in place for possible future use or salvage unless the rinseate samples indicate that the structures were not decontaminated adequately. In this case, the decontamination procedure will be repeated.

6.11.2 Schedule

It is estimated that closure of these units will take four weeks. Inventory removal and disposal will disposal will take one week; decontamination will take one week; sampling and analysis of the rinseate will take two weeks; and certification will take one week.

This schedule assumes that only one round of sampling and analysis of the rinseate will be required and therefore only one decontamination will be required.

6.11.3 Health and Safety Plan

Vickery maintains a site specific document regarding health and safety, emergency procedures and countermeasures. A site specific Contingency Plan is also maintained at the site. The

Contingency Plan is part of the facility's Resource Conservation and Recovery Act Part B Permit and is modified as necessary to reflect changes in facility operations or regulatory requirements. The Contingency Plan is the basis for all health and safety procedures at the facility. Work-specific health and safety plans are typically based on this document. A typical health and safety plan for work at this facility is contained in Appendix C. All employees and visiting contractors are instructed about site specific hazards and emergency procedures prior to performing any work at the facility.

Hazards associated with closure of this WMU include exposure to the chemical constituents and caustic cleaners, as well as the hazards associated with working in an industrial area (i.e., tripping, falling equipment, overhead piping, heat stress, etc.) are reviewed. All personnel within the work area will be required to wear task appropriate personal protective equipment (gloves, hard hat, safety shoes, eye protection, protective clothing and respiratory protection) during closure.

6.11.4 Sampling and Analysis

As stated previously, Vickery will only collect soil samples if evidence of contamination exists after decontamination. The injection well house building floors will be removed and visually inspected for soil contamination. If soil contamination is discovered, soil samples will be collected using the plan described in the following paragraphs.

If visibly contaminated soil is encountered, a grid around the excavation will be developed. The size of the grid will extend 5 feet beyond the limits of the excavation area. This area will be divided into four sections equal to 1/4 of the total area. Figure 11 contains a typical grid. Four borings will be constructed

within each quadrant and soil samples will be collected from a depth of 0 - 2 feet below the surface pad. Each quadrant shall be sampled and analyzed independent of other quandrants. As described below, an organic and a composite inorganic sample will be produced from each quandrant. All grab samples will immediately be split down the middle with half being placed in sample containers for possible organics analysis. The remaining halves will be field screened using a PID or FID and then will be composited and analyzed for the inorganic parameters in the Action Plan. The sample with the highest PID or FID reading will be analyzed for the organics listed in the Action Plan.

6.12 Deepwell Closure

Procedures to plug and abandon the four operating deepwells are specifically regulated by the individual UIC permits issued by the Ohio EPA.

The time required to plug and abandon the four deepwells is estimated at ten weeks (weeks 16 through 25 of the closure period).

6.13 General Facility Areas Closure

A number of other closure activities will be involved in final closure of the facility. These will include:

- Packaging of laboratory samples and chemicals in lab packs conforming to 40 CFR 264.316 and OAC 3745-57-16 and disposal of the laboratory chemicals inventory off-site;
- Decontamination of the laboratory building;
- Sampling of the roads and staging areas in accordance with procedures described in Appendix B and analysis for the parameters listed in Action Plan;

- The removal of contaminated soils from the roads, staging areas, and diked areas;
- Breaching the containment dikes; and
- Decontamination of the personnel changing room.
- Drain and clean caustic scrubber system. Scrubber will be drained and packing will be removed and disposed of. Both will be managed as hazardous waste.
- Decontamination of scales (2) using same method as roadways.

These closure activities should require approximately four weeks to complete (weeks 12 through 16 of closure period).

6.13.1 Closure Certification

Closure certification for the Vickery facility is estimated to require a registered professional engineer on a full time basis during the last four weeks (20 working days) of closure. This will require 160 hours (20 working days at 8 hours per day) for inspection, travel, and preparation of weekly reports and a final report. In addition, this will require 40 hours of administrative time for engineer selection, contract administration, and overall supervision. Finally, closure certification will require 20 hours clerical time, including weekly report and final report preparation.

The time required for closure certification for partial closure will be determined on a unit-by-unit basis. It is estimated that certification of partial closure will require, at a minimum, 40 hours.

APPENDIX A

DECONTAMINATION PROCEDURE

APPENDIX A

DECONTAMINATION PROCEDURES

All tanks, pumps, valves, piping and other equipment that have held untreated or treated wastes designated for decontamination will be emptied of wastes and waste residues and then rinsed (with a high-pressure stream of water containing detergents or other suitable cleaning additives as appropriate followed by a water rinse). Tanks are to be decontaminated using a high pressure wash. This process is designed to reach all internal surfaces of a tank at approximately 100 pounds pressure to a distance of approximately 20 feet. Provided that a sufficient quantity of water is used, this process cleans all internal surfaces of a tank efficiently.

All building floors, drains, sumps, and secondary containment systems will be emptied of any standing liquids, swept to remove any solid residues or debris, rinsed with a high-pressure stream of water containing suitable cleaning additives, and rinsed with water.

The exterior of all mobile equipment will be washed with high-pressure water containing suitable cleaning additives and then water-rinsed.

All rinsewater will be collected and handled as hazardous waste (i.e., treated and disposed on-site or disposed off-site at an approved facility). Tanks, pumps, valves, piping, and other equipment will be decontaminated by triple-rinsing with a caustic cleaning solution that has been found by Vickery to be effective in removing both organic and inorganic contaminants. Rinseate samples will be collected according to procedures outlined in 40 CFR Part

261, Appendix I and/or OAC 3745-51, Appendix I and analyzed for constituents representative of wastestreams handled in the units (typically organic, inorganic metals and PCBs). Rinseate analysis will indicate that the unit is decontaminated according to the closure performance standard. All equipment will be visually inspected following decontamination to ensure that no contamination remains on, in, or around any equipment that has held hazardous waste.

The paved area of the facility will be swept clean and rinsed after all of the regulated units in the area are closed. Swept up debris will be consolidated and shipped to an off-site landfill.

APPENDIX B

SOIL SAMPLE COLLECTION PROCEDURES

APPENDIX B

Soil Sample Collection Procedures

These procedures outline the equipment and other considerations necessary to collect representative soil samples from the surface and subsurface locations. When properly followed, these guidelines serve to maintain sample integrity by preserving physical form and chemical composition to as great an extent as possible.

Selection of Sampling Equipment

Particular attention should be paid to the soil type being investigated in order to select the reagents used for decontamination. These may influence the devices type and style of construction. The sensitive nature of volatile organics requires special consideration in sample equipment selection. Devices that may churn, alter or destroy physical attributes of the soil can cause an unwanted release of volatiles to ambient air. These devices are least recommended for volatile organic sample collection. The device selected should produce a relatively undisturbed soil core from which soil characteristics can be identified. This device should also be able to present the soil in a manner which field screening will be possible. The optimum device will yield a sample that has been minimally disturbed. Correct selection of sampling equipment will save time and expense and allow for the collection of the most representative sample possible. Devices that have minimal soil churning and disturbance are noted below by a "#".

Typical soil sampling equipment includes:

- scoop or hand trowel

- bucket/hand auger
- soil coring device#
- split spoon sampler#
- shelby tube sampler#
- mixing bowl or tray

All equipment is to be constructed of stainless steel except for the split spoon sampler that is usually carbon steel.

All soil sampling devices used for chemical analysis must be decontaminated prior to use and in between sample locations. Once the equipment has been cleaned, it must be wrapped in aluminum foil that has been cleaned in the same manner as the sampling device. Additionally, any heavy equipment used to advance the sampling equipment must be steam cleaned prior to and in between sample locations. All decontamination should be performed in accordance with ASTM D-5088-90 "Decontamination of Sampling Equipment."

Surface Sample Collection

The sample locations must be determined prior to sample collection. If a sampling plan has been developed, confirm the locations before sampling. If a plan is not available or sample relocation due to refusal is necessary, take measurements from fixed objects. This will ensure that sample locations can be identified later. Next, clear all inconsequential surface debris (vegetation, rocks, etc.). After donning disposable gloves, collect the sample using appropriate equipment. All analytical parameters <u>except</u> for organics must be homogenized (ASTM C702-87) either in-situ or in a stainless steel bowl or tray before being placed in the sample container.

Compositing will be done by using nearly equal volume from

each sample. All compositing will be done by the field sampler. Sample will be collected, within the grids, at random locations evenly distributed over the grid.

Reference: "Field Sampling Procedures Manual," New Jersey Department of Environmental Protection and Energy, May 1992.

APPENDIX C

HEALTH AND SAFETY PLAN

4/15/99

HEALTH AND SAFETY PLAN

FOR THE

VICKERY FACILITY
VICKERY, OHIO

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APPENDIX A PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

1.0 COORDINATION AND RESPONSIBILITY

The Project Manager must not allow work to begin at a hazardous waste site until a Site-Specific Health and Safety Plan has been provided to all field personnel. Before visiting the work site, all personnel must attend a site-specific briefing session. This session is conducted by the Health and Safety Manager (HSM) or his/her designee on the potential site hazards and specific requirements of the Health and Safety Plan and includes training in the proper function and operation of all monitoring and personal protective equipment. The Project Manager has the overall responsibility for the health and safety of project personnel. The Site Health and Safety Officer (HSO) will be responsible for ensuring that the Site-Specific Health and Safety Plan is complied with during site remediation operations. If there is any question whether an unplanned occurrence on site may compromise health and safety, the HSO has the authority to interrupt operations and to remove all personnel from the area. If practical, the Project Manager and HSM should be consulted before any operation is interrupted. If work is stopped due to any health and safety concern, immediate attention should be given by health and safety personnel, working in cooperation with the Project Manager, to identify and correct the cause of concern as quickly as possible. Any such incident should be fully documented by the Site HSO in a report to the HSM and Project Manager. In the event of a work stoppage, the client must be notified as soon as possible and kept informed of the progress in resolving the incident until normal operations are resumed.

NOTE: REFER TO SECTION 12 OF THIS APPENDIX FOR PRIMARY EMERGENCY CONTACT NUMBERS

2.0 SITE DESCRIPTION

The Vickery Facility is located at the corner of State Route

412 and State Route 510, two miles west of Vickery, Ohio. This facility is permitted for the storage, treatment, and disposal of liquid hazardous waste. Figure 1-1 provides a location and vicinity map for the facility. Figure 1-2 shows the layout of the existing facility.

The treatment/storage tanks are used to handle wastes generated off-site and on-site. Wastes are blended, filtered, and then disposed of by deepwell injection.

Wastes are received and unloaded in the truck unloading facility. After unloading, wastes are pumped to the storage/treatment tanks. After blending to the desired pH, the waste is pumped through a primary filter to remove solids. Filtered waste is then pumped through polishing filters and onto a disposal well.

Solids removed from the treated wastes are collected and shipped to permitted off-site disposal facilities.

The facility is operated 24 hours a day, 7 days a week.

3.0 PLAN OVERVIEW

Presented is a general site specific health and safety plan from which specific procedures may be derived for partial or complete facility closure. The facility will be closed in a manner to protect the health and safety of the closure team during closure activities. Closure procedures will minimize the need for further maintenance and controls that are necessary to prevent the post closure escape of hazardous constituents, leachate, contaminated run-off or waste decomposition products to ground water, surface water or the atmosphere. All employees and visiting contractors will be instructed about site specific hazards and emergency

procedures prior to performing the work at the facility. All closure activities will be performed in accordance with OSHA 1910.120. Vickery currently maintains documents regarding health and safety, emergency procedures, countermeasures and a contingency plan.

4.0 HAZARD ASSESSMENT

Understanding that the limits and degree of soil and ground water contamination by organics, inorganics, caustics, and chlorinated hydrocarbons is the thrust of this project, those materials will be the major concern. Table 4.1 presents a variety of inhalation limits applicable to workplace exposures. The American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) in the work environment are given for select chemicals. Two TLV standards are presented for each chemical. The Time Weighted Average (TWA) is the time-weighted average concentrations for a normal 8-hour work day and a 40-hour work week. The Short Term Exposure Limit (STEL) is a 15-minute time-weighted average exposure that should not be exceeded at any time during a work day even if the 8-hour time-weighted average is within the TLV. Also presented, when available, is the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL), and the NIOSH and OSHA Standards Completion Program (SCP) Immediately Dangerous to Life or Health (IDLH) level. The PEL values are presented either as a TWA or a ceiling (Ceil) limit. The IDLH value represents a maximum concentration from which one could escape within 30 minutes without any escape impairing symptoms or any irreversible health effects. Other relevant health-based information that applies to this safety and health plan or to the employee's right to know is discussed under the following summary health reviews provided for those chemicals that may present significant risks.

TABLE 4.1
CONTAMINANT EXPOSURE LIMITS

Contaminant	TLV-TWA	TLV-STEL	PEL-TWA	PEL-STEL	IDLH
Sulfuric Acid	1 mg/m^3	3 mg/m^3	1 mg/m^3	---	15 mg/m^3
Nitric Acid	2 ppm	4 ppm	2 ppm	4 ppm	25 ppm
Hydrochloric Acid	5 ppm	5 ppm	---	5 ppm	50 ppm
Chromic Acid	0.01 mg/m^3	---	---	0.1 mg/m^3	15 mg/m^3, Carcinogen
Hydrofluoric Acid	3 ppm-	3 ppm	3 ppm	6 ppm	30 ppm
Ammonium Chloride	10 mg/m^3	20 mg/m^3	10 mg/m^3	20 mg/m^3	Not Available
Phosphoric Acid	1 mg/m^3	3 mg/m^3	1 mg/m^3	3 mg/m^3	1,000 mg/m^3
Acetic Acid	10 ppm	15 ppm	10 ppm	---	50 ppm
Sodium Hydroxide	2 mg/m^3	---	2 mg/m^3	---	10 mg/m^3
Potash	2 mg/m^3	---	---	---	Not Available
Xylene	100 ppm	150 ppm	100 ppm	150 ppm	900 ppm
Gasoline	300 ppm	500 ppm	300 ppm	500 ppm	10,000 ppm
PCB	0.5-1 mg/m^3	---	0.5-1 mg/m^3	---	5-10 mg/m^3, Carcinogen
Phenol	5 ppm	---	5 ppm	---	250 ppm

At the time of partial or full closure, this table will be updated to include the current NIOSH and /or OSHA standards.

SULFURIC ACID

CAS: 7664-93-9

A 1 mg/m³

Sulfuric acid is a dense, oily, colorless, odorless liquid that is strongly corrosive and nonflammable. Physiochemical properties of pure anhydrous acid include:

Molecular weight: 98.08
Specific gravity: 1.84
Freezing point: 10.4°C
Boiling point: 315° to 388°C
Vapor pressure: < 0.001 torr at 20°C

Pure anhydrous acid decomposes into sulfur trioxide and water at 340°C. It is a strong dehydrating agent, reacting violently and with evolution of heat when mixed with water or alcohol. Since its vapor pressure is negligible, it exists in the air only as mist or spray.

Fuming sulfuric acid is a mixture of H_2SO_4 with its anhydride, SO_3, in concentrations ranging from 10% to 70%. Ordinarily SO_3 vapor (it boils at 45°C) is rapidly converted in air to a mist of the acid by reaction with atmospheric moisture.

Sulfuric acid is the most widely used industrial chemical, being employed especially in fertilizer manufacture, petroleum refining, electroplating and acid cleaning, in storage batteries, and as a starting material for a wide variety of chemicals.

Sulfuric acid mist may be generated mechanically or by recondensation of vaporized acid. Particle size may vary from 10 μm down below 1 μ. Condensation would tend to produce particles in the r size range.

ng laboratory animals, guinea pigs are more sensitive than rats, mice or rabbits.[1] Death in guinea pigs results from severe laryngeal spasm and bronchoconstriction. The LC_{50} values for 8-hour exposure range from about 20-60 mg/m³, depending on age of the animals and particle size of the sulfuric acid mist.[2,3] Young animals (1 month) are more sensitive than adults (18 months). At concentrations which are lethal, 2.7 μm particles are more toxic than 0.8 μm particles. A concentration of 8 mg/m³ (1 μm) produces no mortality, but some lung pathology following 8-hour exposures; extending the exposure time to 72 hours did not produce deaths, but did increase the severity of the lung pathology.[2] Guinea pigs exposed continuously, 24 hours a day survived concentrations up to m³ for periods as long as 140 days, but showed some pulmo- pathology.[4]

centrations much lower will produce some degree of bron- constriction in guinea pigs exposed 1-hour as evidenced by increases in pulmonary flow-resistance.[5,6] Small particles produce the greater effect. The concentration producing a 50% increase in pulmonary flow-resistance is 0.3 mg/m³ for 0.3 μm, 0.7 mg/m³ for 1 μm and 6 mg/m³ for 2.5 μm particles. Particles of 7 μm, which penetrate only to the upper respiratory tract and nasal passages caused a response of this magnitude only at 30 mg/m³. A TLV taking particle size into account would appear to be justifiable scientifically, but is probably not currently practical.

Alarie et al[7] exposed monkeys continuously for two years to sulfuric acid. A concentration of 0.38 mg/m³ (2.15 μm) produced slight pathology. A concentration of 0.48 mg/m³ produced a slight al- on in distribution of ventilation. A concentration of 2.43 mg/m³ (3.6 μm) produced moderate changes in both these criteria and a slight decrease in arterial O_2. A concentration of 4.79 mg/m³ produced moderate to severe histopathology and moderate changes in the functional criteria.

Amdur and associates[8] reported results of exposure of normal unacclimated human subjects to the inhalation of sulfuric acid mist. The concentrations ranged from 0.35 to 5 mg/m³. Exposures were from 5 to 15 minutes. Concentrations below 1 mg/m³ could not be detected by odor, taste or irritation. For two persons the threshold was 1 mg/m³, a concentration of 3 mg/m³ was noticed by all, and 5 mg/m³ was very objectionable to some but less so to others. A deep breath at the last concentration usually produced coughing. Pneumotachograph tracings, showing respiratory changes in 15 subjects exposed to measured sulfuric acid mist concentrations, were presented in the paper.

Premysl[9] found the lungs of sulfuric acid plant workers less affected than those of workers exposed to dust. There was some evidence of corrosion of dental enamel. Raule[10] stated that the MAC for those unaccustomed to H_2SO_4 was 1 mg/m³, but those used to it could tolerate three to four times as much. Workers chronically exposed may show various lesions of the skin, tracheo-bronchitis, stomatitis, conjunctivitis or gastritis. Malcolm and Paul[11] found severe erosion of the teeth in battery plant workers. Forming room workers (3 to 16 mg/m³ of sulfuric acid mist found) were most severely affected, while charging room workers (0.8 to 2.5 mg/m³) were affected to a lesser degree.

The TLV of 1 mg/m³, as a time-weighted average, is recommended to prevent pulmonary irritation and injury to the teeth. At particle sizes likely to occur in industrial situations it should be adequate to prevent harmful effects. No STEL is recommended at this time, however, the reader is encouraged to review the section on *Excursion Limits* in the Introduction to the Chemical Substances of the current TLV booklet for guidance and control of excursions above the TLV-TWA, even when the 8-hour TWA is within the recommended limits.

Other recommendations: Cook (1945) 5 mg/m³; Smyth, Elkins, USSR, NIOSH and Czechoslovakia, 1 mg/m³. This limit also recommended by West and East Germany and Sweden.

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NITRIC ACID
(HNO_3, Azotic Acid, Hydrogen Nitrate)

Nitric acid is a colorless liquid. If exposed to light, the color of liquid may turn yellowish-brown. Nitric acid is extremely corrosive and may cause severe burns, ulcers and necrosis of the skin, mucous membranes and eye tissues. Exposures to nitric acid occur most commonly through absorption and inhalation routes.

Exposure to high concentrations of nitric acid may result in severe pulmonary irritation. Acute exposures may also produce chills, fever, headache, nausea, vomiting and possible death. If an acute episode is survived, chemical bronchiolitis may develop within a few days. Chronic exposure may result in pulmonary dysfunction with decreased respiratory performance and death.

TLV:	2 ppm TWA, 4 ppm STEL
PEL:	2 ppm TWA, 4 ppm STEL
IDLH:	100 ppm
DESCRIPTION:	Colorless or yellowish-brown liquid with a acrid/suffocating odor
SOLUBILITY:	Miscible
FLASH POINT:	N/A
IONIZATION POTENTIAL:	11.03 eV
VAPOR PRESSURE:	2.6 to 103 mm Hg @ 20C
LEL:	N/A
UEL:	N/A
RESPIRATOR CARTRIDGE BREAKTHROUGH TIME:	N/A
HNu SENSITIVITY:	N/A
OVA SENSITIVITY:	N/A

HYDROGEN CHLORIDE

CAS: 7647-01-0

ING LIMIT, 5 ppm (= 7 mg/m³)

Hydrogen chloride is a corrosive, colorless, nonflammable gas which fumes in air. It possesses a characteristic suffocating, pungent odor. Its physiochemical properties include:

Molecular weight: 36.47
Freezing point: −114.22°C
Boiling point: −85.05°C
Vapor pressure: > 1 atm
Vapor density: 1.268 (air = 1)

It dissolves in water to form hydrochloric acid, which usually contains 20% (constant boiling acid) or 38% of HCl.

Anhydrous HCl is used in making alkyl chlorides, in hydrochlorination, polymerization, alkylation, and nitration reactions. The acid is employed where strong acids are needed, as in activating oil wells, ore reduction, pickling, and metal cleaning, and food processing.

Machle and associates[1] exposed animals to hydrogen chloride gas and described its strong irritant effect. Repeated exposures of animals at a concentration of about 34 ppm caused no immediate toxic effects and no morphologic changes attributable to exposure. Henderson and Haggard[2] reported that exposure of men at 50-100 ppm for one hour was barely tolerable, 35 ppm caused irritation of the throat on short exposure, and 10 ppm was the maximal concentration allowable for prolonged exposure. Elkins[3] stated, however, that hydrogen chloride was immediately irritating when inhaled at concentrations of 5 ppm or more. He believed that lower concentrations were not harmful. Patty[4] also reported that concentrations above 5 ppm were disagreeable.

Fairhall[5] quoted a report by Soviet investigators that workers exposed to hydrochloric acid suffered from gastritis. Many cases of chronic bronchitis were also observed.

Based on these reports, a ceiling limit of 5 ppm is interpreted to be sufficiently low to prevent toxic injury from exposure to hydrogen chloride, but on the borderline of severe irritation.

Other recommendations: Cook (1945) 10 ppm; Smyth (1956) 5 ppm; Soviet (1966) 4 ppm; Czechoslovakia (1969) 5 ppm; West Germany (1974) and Sweden (1975) 5 ppm; East Germany (1973) 4 ppm.

References

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HYDROGEN FLUORIDE

CAS: 7664-39-3

HF

CEILING LIMIT, 3 ppm (≈ 2.5 mg/m³), as F*

Hydrogen fluoride is a colorless gas at temperatures above its boiling point; at lower temperatures it is a fuming liquid. Its physiochemical properties include:

Molecular weight: 20.01
Specific gravity: 0.988
Freezing point: −83°C
Boiling point: 19.54°C
Vapor pressure: 76 torr at 20°C

There is association of molecules at normal room temperatures, so that the actual density of the gas is greater than would be calculated from the formula HF. A water solution, containing up to 70% HF, hydrofluoric acid, is frequently used. It is slightly soluble in water and soluble in most organic compounds.

Anhydrous HF is employed as a catalyst in numerous reactions of chemical synthesis; as a fluorinating agent; in the production of fluorine and aluminum fluoride; and in refining uranium. Hydrofluoric acid is used to etch glass, for pickling stainless steel, in the production of gasoline and aluminum, and for acidizing oil wells.

Ronzani[1] found no injurious action of fluoride in animals exposed for 30 days at 3 ppm HF. At that time much higher concentrations (40 ppm) were employed in inhalation therapy for pulmonary tuberculosis.[2] Machle et al[3] reported that guinea pigs and rabbits survived 40 ppm for 41 hours; deaths resulted from 300 ppm for two hours or more. Stokinger and associates[4] found that animals tolerated 7 ppm of HF with only mild irritation of the respiratory tract in repeated daily exposures.

Largent[5] reported that repeated exposures at 17 ppm resulted in damage to the lungs, liver and kidneys of animals, but at 8.6 ppm pathologic changes were insignificant, except for lung injury in one dog. Repeated experimental human exposures six hours a day for 10 to 50 days at concentrations as high as 4.7 ppm were tolerated without severe effects. Redness of skin, and some burning and irritation of the nose and eyes were noted at concentrations above 3 ppm. Three subjects who inhaled approximately 3 ppm had average urinary excretions of 6.69, 11.47, and 9.40 mg/day of fluoride.[5,6]

Prolonged inhalation of HF in high concentrations would presumably lead to fluorosis, which has been more often observed as a result of the inhalation or ingestion of fluoride salts (q.v.).

Kleinfeld[7] reported a fatal case of acute pulmonary edema resulting from an accident involving hydrofluoric acid.

In its criteria document for hydrogen fluoride, NIOSH recommends a workplace environmental limit of 2.5 mg/m³ as a TWA, with a 15 minute ceiling of 5 mg/m³, corresponding to 30.06 and 6.1 ppm, respectively.[8] Additional references cited which support these limits include a PHS study,[9] which showed that no significant changes in pulmonary function resulted from occupational exposure at an average concentration of 1.03 ppm of HF. A report by Rye[10] indicated no increase in respiratory complaints among workers exposed at concentrations of HF and SiF_4 below 2.5 mg/m³. The study by Derryberry et al[11] is interpreted as indicating a threshold for minimal increases in bone density due to fluoride (fluorosis) of below 3.38 mg/m³ of fluoride, or 4.3 ppm of HF.

The Committee considers hydrogen fluoride a primary irritant, therefore a ceiling limit of 3 ppm is recommended. This should also minimize the occurrence of fluorosis.

Other recommendations:[12] Australia, Belgium, Finland, West Germany, Japan, Netherlands, Sweden, and Yugoslavia, 3 ppm; Switzerland and Italy, 1.5 ppm; Czechoslovakia, East Germany, and Romania, 1.2 ppm; and the USSR, 0.6 ppm.

* Ceiling limit proposed in 1984

References

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12. *Occupational Exposure Limits for Airborne Toxic Substances,* 2nd (Rev.) ed., pp. 128-129. Occupational Safety and Health Series No. 37. International Labour Office, Geneva (1980).

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CHROMIC ACID

NIOSH #: GB 2450000

CAS RN: 7738945
mf: CrH_2O_4; mw: 118.02

SYNS:
ACIDE CHROMIQUE (FRENCH)
CHROMIC (VI) ACID

CODEN:
MUREAV 54,139,78

TOXICITY DATA:
mmo-sat 80 ug/plate

Aquatic Toxicity Rating: TLm96:000-under 1 ppm WQCHM* 2,-,74. Criteria Document: Occupational Exposure to Cr(VI) rec std: Air: TWA 25 ug (Cr (VI))/m3; CL 50 ug/m3/15M NTIS**.
Standards and Regulations: OSHA Standard Air: CL 100 ug(CrO_3/m3 (SCP-0) FEREAC 39,23540,74. NIOSH Manual of Analytical Methods VOL 1 152,169, VOL 3 S317. Reported in EPA TSCA Inventory, 1980.
THR: MUT data. See also chromium compounds. A poison.
Disaster Hazard: When heated to decomp it emits smoke and irr fumes.
Incomp: Acetone.
For further information see Vol. 2, No. 2 and Vol. 3, No. 3 of *DPIM Report*.

AMMONIUM CHLORIDE

— 12125-02-9

Fume

TLV-TWA, 10 mg/m³

TLV-STEL, 20 mg/m³

Ammonium chloride is a white crystaline solid, somewhat hygroscopic, with a cool saline taste. Physiochemical properties include:

Molecular weight: 53.50
Specific gravity: 1.54
Melting point: sublimes at 350°C without melting

It is soluble in water and glycerol, slightly in alcohol, and almost insoluble in ether, ether acetate, and acetone.

Ammonium chloride is used in the manufacture of various ammonia compounds and dry batteries, as a mordant in dyeing and printing soldering flux, fertilizer, pickling agent in zinc coating and tinning, electroplating, washing powders, snow treatment, resins and adhesive of urea-formaldehyde, medicine, food industry.

Ammonium chloride is not considered a serious industrial hazard. Few of the reference books on industrial health or toxicology even mention it. However, Sax[1] does list ammonium chloride, indicating it to be a mild irritant to the skin and respiratory passages, with a low-grade systemic toxicity by ingestion.

Large amounts of ammonium chloride fume are frequently evolved in galvanizing operations. A study of these processes indicated that control of fumes by mechanical dilution or local exhaust ventilation was usually provided. Concentrations of ammonium chloride were found to average below 5 mg/m³ meter of air, although peak concentrations were much higher. Zinc fume levels were found to be insignificant.

In contrast, Calaceto,[2] in a study of the efficiency of a fume-removal system for an automatic strip-galvanizing installation, found zinc and ammonium chloride fumes in approximately equal amounts. The reported LD_{50} intramuscular in rats is 30 mg/kg.[3]

A TLV for ammonium chloride of 10 mg/m³, as a time-weighted average, is recommended to prevent irritation of the respiratory passages, with a STEL of 20 mg/m³.

References

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PHOSPHORIC ACID

CAS: 7664-38-2

H_3PO_4

TLV-TWA, 1 mg/m³
TLV-STEL, 3 mg/m³

Phosphoric acid is a colorless, odorless solid at a temperature below 21°C or a viscous, clear, syrupy liquid, neither of which are combustible. Its physiochemical properties include:

Molecular weight: 98.00
Specific gravity: 1.834 at 18°C
Melting point: 42.35°C
Vapor pressure: 0.03 torr at 20°C

It is very soluble in water. When heated to 213°C, it is converted to pyrophosphoric acid ($H_4P_2O_7$).

Phosphoric acid is of tremendous industrial importance, being used in fertilizers, detergents, foods and beverages, water treatment, pickling and rustproofing metals and for many other purposes.

The recommended threshold limit is based by analogy from comparable experience and data for sulfuric acid. Fumes of phosphorus pentoxide at concentrations ranging from 0.8 to 5.4 mg/m³ we noticeable, but not uncomfortable, and concentrations between 3 and 11.3 mg/m³ caused coughing among the inexperienced, b could be tolerated. Concentrations of 100 mg/m³ were unen ble, except to hardened workers.[1] The TLV of 1 mg/m³ is acc ingly below the concentration that causes throat irritation amor unacclimated workers and well below that which is well tolerate by acclimated workers.

According to the AIHA Hygiene Guide,[2] phosphoric acid is le hazardous than nitric acid or sulfuric acid.

A maximum concentration of 1 mg/m³, as a TLV-TWA, and STEL 3 mg/m³ are recommended for phosphoric acid. The TLV 1 mg/m³ is accordingly below the concentration that causes thro irritation among unacclimated workers and well below that whic is well tolerated by acclimated workers.

Other recommendations: Sweden (1978) 1 mg/m³; USSR (P_2C 1976) 1 mg/m³.

References

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ACETIC ACID

CAS: 64-19-17

—ic acid

C)H

TLV-TWA, 10 ppm (= 25 mg/m³)

TLV-STEL, 15 ppm (= 37 mg/m³)

Acetic acid is a clear, colorless, flammable liquid with a pungent odor. Physiochemical properties include:

Molecular weight: 60
Specific gravity: 1.0492 at 20°C
Boiling point: 118°C
Melting point: 16.63°C
Vapor pressure: 11 torr at 20°C
Closed cup flash point: 103°F (39°C)[1]
Explosive limits: Upper, 16%; lower, 5.4% by volume in air
Refractive index: 1.3716 (20°C)

It is miscible with water, alcohol, glycerin and ether; insoluble in carbon disulfide.

It is used in the manufacture of acetic anhydride, cellulose acetate and vinyl acetate monomer, acetic esters, and chloroacetic acid. It is also used in the production of plastics, pharmaceuticals, dyes, insecticides, photographic chemicals, food additive (as vinegar), natural latex coagulant, and in textile printing.

Sterner[2] concluded that 10 ppm is relatively nonirritating on the basis of industrial experience. Patty[3] reported that 800-1200 ppm cannot be tolerated for longer than three minutes. Smyth[4] found inhalation of 16,000 ppm by rats killed one of six. Vigliani and Zurlo[5] regard 20 to 30 ppm to be without danger. They reported that workers exposed for 7 to 12 years at concentrations of 60 ppm, plus one hour daily at 100 to 260 ppm, had no injury except slight irritation of the respiratory tract, stomach, and skin. However, Parmeggiani and Sassi[6] found conjunctivitis, bronchitis, pharangitis, and erosion of exposed teeth, apparently in the same workers. Baldi[7] reported conjunctival irritation from concentrations below 10 ppm. Amdur[8] found minor changes in respiration in guinea pigs inhaling 5 ppm acetic acid, with more pronounced effects at 100 ppm.

A time-weighted average TLV of 10 ppm and a STEL of 15 ppm are recommended to prevent undue irritation.

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8. Amdur, M.: *Ind. Hyg. Assoc. J.* 22:1 (1961).

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SODIUM HYDROXIDE

CAS: 1310-93-2

Caustic soda; Lye

NaOH

CEILING LIMIT, 2 mg/m³

Sodium hyroxide is a white deliquescent solid. Its physiochemical properties include:

Molecular weight: 40.01
Specific gravity: 2.13 at 25°C
Melting point: 318.4°C
Boiling point: 1390°C

It is soluble in water (42 g/100 ml at 0°C), alcohol and glycerine, but insoluble in non-polar solvents.

As the least expensive soluble strong base, sodium hydroxide is widely employed in industries such as rayon, cellophane and textiles, pulp and paper, soap and detergents, etching and electroplating, and many others.

Caustic dusts are irritating to the upper respiratory system. Although prolonged exposure to high concentrations may cause discomfort and even ulceration of nasal passages, subjective symptoms are often relied upon as an indication for the need of control.

Patty,[1] on the basis of the irritant effects of caustic mists, encountered in concentrations of 1 to 40 mg/m³ air, believes that 2 mg sodium hydroxide/m³ air represents a concentration that is noticeably, but not excessively, irritant.

The NIOSH criteria document[2] cites two reports which indicate noticeable irritation at concentrations of NaOH aerosol below 2 mg/m³. In one case "burning/redness" of the nose, throat or eyes was noted among workers engaged in cleaning operations where airborne concentrations of sodium hydroxide between 0.005 and 0.7 mg/m³ were found.[3] Solvents, including Stoddard Solvent, were also present, in concentrations as high as 780 mg/m³. Lewis[4] reported irritation of the throat or eye watering among persons cleaning ovens and exposed briefly at concentrations of 0.24, 1.86 and 0.8 mg of NaOH per cubic meter of air; no irritation resulted from 0.28 mg/m³.

Animal studies mentioned by NIOSH[2] indicated that rats exposed 30 minutes a day at unmeasured concentrations of sodium hydroxide aerosols suffered pulmonary damage after 2 to 3 months.[5]

The NIOSH recommendation for a workplace environmental standard is a 15-minute ceiling of 2 mg/m³.

The above data suggest that 2 mg/m³, as a ceiling value, is not unduly restrictive.

Other recommendations: East Germany (1973) and West Germany (1974) 2 mg/m³; Sweden (1975) Ceiling Limit 2 mg/m³; USSR (1972) 0.5 mg/m³.

References

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2. NIOSH: *Criteria for a Recommended Standard — Occupational Exposure to Sodium Hydroxide*. DHEW Pub. No. (NIOSH) 76-105 (1976).
3. Hervin, R.L. and S.R. Cohen: *Health Hazard Evaluation Determination — Report No. 72-97-135*. NIOSH (1973). Cited in ref. No. 2.
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POTASSIUM HYDROXIDE

CAS: 1310-58-3

KOH

EILING LIMIT, 2 mg/m³

Potassium hydroxide is a white deliquescent material which may be in the form of pellets, sticks, lumps or flakes. Its physiochemical properties include:

Molecular weight: 56.10
Specific gravity: 2.044
Melting point: ≈ 360°C
Boiling point: 1320° to 1324°C
Vapor pressure: 1 torr at 719°C

It absorbs CO_2 and moisture from air rapidly. KOH is soluble in water, alcohol and glycerin, and slightly soluble in ether.

Potassium hydroxide may be used in the preparation of certain potassium compounds, and in preference to the cheaper sodium hydroxide as a strong alkali when the generally greater solubility of potassium compounds, in comparison with those of sodium, is important, e.g., as an absorbent for carbon dioxide.

The effects of potassium hydroxide are similar to those of other strong alkalies such as sodium hydroxide. They gelatinize tissue to form soluble compounds which many result in deep and painful lesions. Exposure to dust or mist may cause irritation of the eyes and respiratory tract and lesions of the nasal septum.[1]

Patty suggests a threshold limit of 2 mg/m³.[2]

Because potassium hydroxide is extremely corrosive to tissue, a ceiling limit of 2 mg/m³ is recommended.

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GASOLINE
(Petrol, Motor spirits, Benzin)

Gasoline is used as a fuel, diluent, and solvent throughout industry. It is most commonly used as a motor fuel, and exists as a mixture of a wide variety of aliphatic and aromatic organic chemicals. In addition, gasoline may contain lead compounds that may pose an ingestion hazard. It is considered acceptable to limit the exposure to gasoline based on the aromatic hydrocarbon content, which varies from batch to batch. Significant routes of entry are inhalation and ingestion. The role of cutaneous absorption is not known, but may add to the exposure.

Gasoline is irritating to the skin, conjunctiva, and mucous membranes. Dermatitis may result from repeated and prolonged contact with the liquid, which may defat the skin. Certain individuals may develop hypersensitivity. Gasoline vapor acts as a central nervous system depressant. Exposure to low concentrations may produce flushing of the face, staggering gait, slurred speech, and mental confusion. In high concentrations, gasoline vapor may cause unconsciousness, coma and possibly death resulting from respiratory failure. Ingestion and aspiration of the liquid gasoline usually occurs during siphoning. Chemical pneumonitis, pulmonary edema, and hemorrhage may follow. Aromatic hydrocarbon content may also cause hematopoietic changes. Absorption of alkyl lead antiknock agents contained in many gasolines poses an additional problem especially where there is prolonged skin contact.

TLV:	300 ppm TWA, 500 ppm STEL
PEL:	N/A
IDLH:	N/A
DESCRIPTION:	Brownish colored liquid with a characteristic odor
SOLUBILITY:	insoluble
FLASH POINT:	-50F
IONIZATION POTENTIAL:	N/A
VAPOR PRESSURE:	N/A
LEL:	1.3%
UEL:	6.0%
RESPIRATOR CARTRIDGE BREAKTHROUGH TIME:	N/A
HNu SENSITIVITY:	N/A
OVA SENSITIVITY:	N/A

XYLENE

($C_6H_4(CH_3)_2$, p-ortho-Xylene, 1,2-Dimethyl Benzene; meta-Xylene, 1,3-Dimethyl Benzene; para-Xylene, 1,4-Dimethyl Benzene

Xylene vapor may cause irritation of the eyes, nose, and throat. Repeated or prolonged skin contact with xylene may cause drying and defatting of the skin which may lead to dermatitis. Liquid xylene is irritating to the eyes and mucous membranes, and aspiration of a few milliliters may cause chemical pneumonitis, pulmonary edema, and hemorrhage. Repeated exposure of the eyes to high concentrations of xylene vapor may cause reversible eye damage. Acute exposure to xylene vapor may cause central nervous system depression and minor reversible effects upon liver and kidneys. At high concentrations xylene vapor may cause dizziness, staggering drowsiness, and unconsciousness. Also at very high concentrations, breathing xylene vapors may cause pulmonary edema, anorexia, nausea, vomiting and abdominal pain.

TLV:	100 ppm TWA, 150 ppm STEL
PEL:	100 ppm TWA, 150 ppm STEL
IDLH:	10,000 ppm
DESCRIPTION:	Colorless liquid with an aromatic odor
SOLUBILITY:	0.00003%
FLASH POINT:	81 DEG. F (p - isomer)
IONIZATION POTENTIAL:	8.56 eV (o,m - isomers)
	8.44 eV (p - isomer)
VAPOR PRESSURE:	9 mm Hg @ 20C (m - and p - isomers)
LEL:	1%
UEL:	7%
RESPIRATOR CARTRIDGE BREAKTHROUGH TIME:	99 minutes at 1000 ppm
HNu SENSITIVITY:	(p - xylene) 114 % with a 10.2 eV lamp
	(m - xylene) 112 % with a 10.2 eV lamp
OVA SENSITIVITY:	(o,p - xylenes) 116%
	(m - xylene) 111%

PCB

(PCBs, Aroclor, Clophen, Phenochlor)

Polychlorinated biphenyls are both toxic and persistent in our environment. PCBs bio-accumulate and bio-concentrate in the fatty tissue of organisms. Prolonged skin contact may cause the formation of chloracne and the irritation of the eyes, nose and throat. Toxic effects are dependent upon the degree of chlorination. Acute and chronic exposure can cause liver damage. Symptoms of liver damage include edema, jaundice, vomiting, anorexia, nausea, abdominal pains and fatigue. Where liver damage has been severe, the patient may pass into a coma and die. When heated to decomposition, PCBs emit highly toxic fumes. Polychlorinated biphenyls are suspected to be a human carcinogen.

TLV:	0.5mg/m^3 TWA (Skin)
PEL:	0.5 mg/m^3 TWA (Skin)
IDLH:	N/A
DESCRIPTION:	N/A
SOLUBILITY:	Insoluble
FLASH POINT:	349°F
IONIZATION POTENTIAL:	N/A
VAPOR PRESSURE:	0.001 Torr @ 20°C
LEL:	N/A
UEL:	N/A
RESPIRATOR CARTRIDGE BREAKTHROUGH TIME:	480 minutes at 1000 ppm
HNu SENSITIVITY:	N/A
OVA SENSITIVITY:	N/A

PHENOL
(C_6H_5OH)

Phenol is commonly used in the semi-conductor industry as a component in the formation of plastics and resins. Phenol has a marked corrosive effect on any tissue. When it comes in contact with the eyes it may cause severe damage and blindness. On contact with the skin, it does not cause pain but causes a whitening of the exposed area. If the chemical is not removed promptly, it may cause a severe burn or systemic poisoning. Systemic effects may occur from any route of exposure. These include paleness, weakness, sweating, headache, ringing of the ears, shock, cyanosis, excitement, frothing of the nose and mouth, dark colored urine, and death. If death does not occur, kidney damage may appear. Repeated or prolonged exposure to phenol may cause chronic phenol poisoning. This condition is very rarely reported. The symptoms of chronic poisoning include vomiting, difficulty in swallowing, diarrhea, lack of appetite, headache, fainting, dizziness, dark urine, mental disturbances, and possibly, skin rash. Liver and kidney damage and discoloration of the skin may occur.

TLV:	5 ppm TWA Skin
PEL:	5 ppm TWA
IDLH:	100 ppm
DESCRIPTION:	Colorless to pink solid or thick liquid with a characteristic sweet, tarry odor
SOLUBILITY:	8.4 %
FLASH POINT:	174 DEG. F
IONIZATION POTENTIAL:	8.5 eV
VAPOR PRESSURE:	0.36 mm Hg @ 20C
LEL:	1.7 %
UEL:	8.6 %
RESPIRATOR CARTRIDGE BREAKTHROUGH TIME:	N/A
HNu SENSITIVITY:	77 % with a 9.5 eV lamp
OVA SENSITIVITY:	N/A

5.0 QUALITATIVE RISK ASSESSMENT

A number of chemicals have been received at the Vickery Site. Appropriate personal protective equipment will be prescribed to limit skin contact with and inhalation of these materials.

6.0 ENVIRONMENTAL MONITORING

Due to the potential variety and unknown concentrations of contaminants, continuous monitoring for total hydrocarbons with an organic vapor analyzer (OVA) may be required during the entire time work is in progress. The Site HSO should be constantly aware of the contaminant levels and ready, at any time to upgrade protection. The results of this monitoring will be used to designate required respiratory protection under Section 7.

7.0 REQUIRED PERSONAL PROTECTIVE EQUIPMENT (PPE)

Organic vapor half-mask respirators will need to be on site but will only be required when the results of monitoring indicate according to the following schedule:

1. Up to 1 ppm, no respirator required
2. 1 to 10 ppm, a minimum of a half-mask respirator equipped with a HEPA/organic vapor combination cartridges
3. 10 to 50 ppm, a minimum of a full-facepiece respirator equipped with a HEPA/organic vapor combination cartridges
4. Above 50 ppm, a pressure-demand or other positive pressure air-supplied respirator equipped with escape provisions
5. Above 700 ppm, site HSO must evacuate site due to flammability concerns.

NOTE: The half-mask respirator cartridges shall be replaced weekly, and the full facepiece respirator cartridges replaced daily, when used.

PPE Other than Respirators

Because the drilling team is following Vickery's guidelines, with respect to safety and health, they will be required to wear saranex suits, splash-resistant goggle, Bata Haxmax boots, and protective gloves, should splash hazards, free product, or absorption hazards exist. During visible dusty conditions and conditions when acid gases are present, all site personnel shall wear tyvek protective clothing, half-mask respirators with organic HEPA/vapor combination cartridges, and dust goggles. Full-face respiratory protection is optional under visible dusty conditions. If wet conditions or free-product exist, saranex protective clothing and full-face respirators must be worn by sampling personnel. This up-grade would provide better respiratory protection and maximum eye protection from splash hazards. Chemical resistant gloves must be worn during all sampling activities. If the chemical resistant glove is torn or cut during sampling activities, sampling personnel shall wear a protective cotton over-glove. During noisy conditions, hearing protection shall be worn. A hard hat shall be worn during drilling operations occurring within fifty feet of the drill platform. The following items must be available to all personnel:

- Tyvek Suit (Dusty Conditions)
- Saranex Suits (Wet Conditions)
- Neoprene Boots (Steel Toe)
- Nitrile Gloves
- Cotton Over-gloves
- Ear Plugs (Noisy Conditions)
- Hard Hat
- Fire Extinguisher
- CB Radio

- Decon Sprayers
- Drink Cooler
- Eyewash (15 minute)
- Goggles (Dusty Conditions)
- First-Aid Kit

A summary of required non-respiratory PPE is contained in Appendix A.

8.0 HEAT STRESS

When the body temperature rises, the body seeks to dissipate the excess heat. The major disorders due to heat stress are heat cramps, heat exhaustion, and heat stroke. Heat cramps are painful spasms which occur in the muscles of workers who sweat profusely in the heat and drink large quantities of water, but fail to replace the body's lost salts and electrolytes.

Heat exhaustion is characterized by extreme weakness or fatigue, dizziness, nausea, and headache. In serious cases, a worker may vomit or lose consciousness. The skin is clammy and moist, complexion pale or flushed, and the body temperature can be normal or slightly higher than normal. Treatment consists of rest in a cool place and replacement of body water lost by perspiration. Mild cases may recover spontaneously with this treatment. Severe cases may require care for several days. There are no permanent effects.

Heat stroke is caused by the breakdown of the body's heat regulating mechanism. The skin is very dry and hot with a red or bluish appearance. Unconsciousness, mental confusion, or convulsions may occur. Without quick and adequate treatment, the result can be death or permanent brain damage. Medical assistance

should be given quickly. The person should be moved to a cool place. Body heat should be reduced artificially by soaking the person's clothes with water and fanning them. The following steps can be taken to reduce heat stress:

- Acclimate the body.
- Drink more liquids to replace body water lost during sweating.
- Increase salt consumption (salt tablets are not recommended).
- Wear personal cooling devices.
- Wear supplied air suits or respirators equipped with a vortex tube that cools the air being supplied.

9.0 ACCIDENT PREVENTION

Instructing respective employees in safe work practices and emergency procedures is the responsibility of Vickery and any subcontractor(s). Vickery shall provide the subcontractor(s) with the Health and Safety Plan, for information only. Adherence to the standard safety operating procedures and practices described in Section 10 shall be required to minimize the risk of accidents resulting in injury or excessive chemical exposure.

10.0 STANDARD OPERATING SAFETY PROCEDURES AND CONTROLS

These operating procedures are designed to reduce the risks of inadvertent or accidental chemical exposure or injury during field operations.

Personal Precautions

- Be familiar with all standard operating procedures and adhere to all instructions and requirements in the unit-specific safety plan.

- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in the Exclusion and Contamination Reduction Zones. However, a supply of cold water and disposable cups will be located in the decontamination area such that employees will have access to water with only removal of gloves, hat, and respirator where used.

- Contact lenses will not be worn in the Exclusion and Contamination Reduction Zones.

- Hands and face must be thoroughly washed upon leaving the work area. Whenever decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as possible after the protective garment is removed.

- No facial hair which interferes with a satisfactory respirator fit of the mask-to-face-seal is allowed on personnel required to wear respirators.

- Avoid contact with contaminated or suspected contaminated surfaces. Whenever possible, avoid walking through puddles, pools, mud, etc. Avoid kneeling or sitting on the ground, equipment, or drums.

- Personal articles shall be prohibited in any contaminated area.

- Medicine and alcohol can exacerbate the effects from exposure to toxic chemicals. Alcoholic beverage intake should be minimized or avoided on off work hours. Prescribed drugs should not be taken by personnel on site operations where the potential for absorption, inhalation, or ingestion of toxic substances exists unless specifically approved by a qualified physician. Do not work when ill.

- Be alert to potential health and safety hazards.

Operational Requirements

- All personnel going on-site shall be adequately trained and thoroughly briefed on anticipated hazards, equipment to be worn, safety practices to be followed, emergency procedures, and communications.

- Respiratory protective devices and/or protective clothing appropriate to the designated levels of protection shall be worn by all personnel going into areas designated for wearing protective equipment.

- Personnel on-site shall use the buddy system when wearing respiratory protective equipment.

- Visual and/or voice contact shall be maintained between pairs on-site. Entry team members shall remain close together to assist each other during emergencies.

- During continual operations, on-site workers shall act as safety backup to each other. Off-site personnel shall provide emergency assistance.

- Personnel should practice new or unfamiliar operations prior to doing the actual procedure.

11.0 DECONTAMINATION CONTROL MEASURES

Site work zones shall be established to reduce the accidental spread of hazardous substances by workers or equipment. The flow of personnel and equipment among these zones shall be controlled through designated access and egress points by the Site HSO. Control zones shall be delineated on a site map.

A. Site Organization and Control

Site organization and control will be established and maintained according to the recommendations set forth in EPA's "Standard Operating Safety Guide," November 1984, and the NIOSH/OSHA/USCG/EPA "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities," October 1985. Three general areas of operation shall be established to reduce the risk of personnel exposure to hazardous substances. The three areas are:

- Exclusion Zone (Zone A)
- Contamination Reduction Zone (Zone B)
- Support Zone (Zone C)

The dimensions of each area and the safe working distances between each area shall be balanced against practical work considerations and existing field conditions.

Exclusion Zone

The Exclusion Zone is generally defined as the area of approximately 1 boom radius from the well holes, or the area that is contaminated or will be unavoidably contaminated by site operations. Since this area shall be considered contaminated, all personnel within the area must use the prescribed levels of personal protection. A checkpoint shall be established at the periphery of the Exclusion Zone to regulate the flow of personnel and equipment in and out of the area. The initial Exclusion Zone boundary (hotline) is based upon subsequent observations and/or measurements. Any change in the protection level specified by the original health and safety plan shall be approved by the Vickery HSO and the client's contracting officer before being initiated. The hotline shall be well-defined by geographical or physical boundaries and shall be physically secure.

As defined in this health and safety plan, there may be some areas where the use of respiratory protection is not required during normal work activities. Respirators should be immediately available for use, however, should a potential hazard become evident. These areas are identified by the following characteristics:

- No known airborne hazards are present and there is little or no potential for release of hazardous airborne contaminants,
- Work operations preclude splashing of hazardous materials.

Hard hats are required in the exclusion zone. Any item taken into the Exclusion Zone shall be considered to be contaminated

until carefully inspected by the site HSO and/or decontaminated. All vehicles, equipment, instruments and materials taken into the Exclusion Zone shall remain in the zone until no longer needed.

Contamination Reduction Zone

The Contamination Reduction Zone (Zone B) shall serve as a buffer between the Exclusion Zone and the Support Zone, and is intended to prevent the spread of contaminants from work areas. All decontamination procedures shall be conducted within this area, along a defined corridor.

The boundary between the Support Zone and Contamination Reduction Zone is the contamination control line. This boundary separates the area of possible contamination from clean areas. Entry into the Contamination Reduction Zone from the Support Zone will be through a controlled access point. Personnel entering this area shall be wearing the prescribed personal protective equipment. Exit from the Contamination Reduction Zone requires the removal of any suspected or known contaminants through compliance with established decontamination procedures.

Support Zone

The Support Zone (Zone C) shall consist of a staging area in a non-contaminated or clean area. It shall contain the command post for field operations, a first aid station, and other elements necessary to support site activities. Normal work clothes and safety shoes are worn in this area. Location of access points and the command post shall be based upon favorable wind direction, topography and site accessibility, when conditions allow.

- Wind direction - Preferably, the command post should be located upwind of the site Exclusion Zone. However, wind

direction shift and other conditions may be such that the ideal location based upon wind direction does not exist.

- Topography - The terrain, i.e., woods, water or hills, and available space may limit selection of command post sites.

Modifications to Site Control

The use of the three-area designation with access/exit control points coupled with established decontamination procedures provides reasonable assurance against the translocation of contaminants. This system of control is based on a "worst case" situation.

Less stringent site control and decontamination procedures may be utilized based upon field activities and results of monitoring data. Any modification shall be authorized by the Site HSO.

B. Decontamination Procedures

Safe personal hygiene practices are discussed in Section 10, Standard Operating Safety Procedures and Controls. Decontamination shall be performed under the supervision of the site HSO. Personnel and portable field equipment decontamination shall be carried out in the contamination reduction corridor. When working in the Exclusion Zone, care should be taken to avoid contamination of equipment (particularly instruments) whenever possible. Drill rigs, other heavy equipment, and ancillary tools will be cleaned at the heavy equipment decontamination area within the Exclusion Zone and adjacent to the Hotline. Critical zones and areas shall be variously identified and delineated with surveyor's tape.

For all exit from the Exclusion Zone, decontamination stations shall consist of:

1. Equipment drop
2. Boot, glove and respirator wash

3. Boot, glove, and respirator rinse

4. Protective clothing disposal (into 55-gallon drum or other suitable container)

5. Respirator wash and rinse

6. Hand and face wash and rinse

Monitoring instruments and protective equipment shall be decontaminated if the equipment has been in contact with the ground or splashed with contaminated water, mud or other material. Decontamination solution shall consist of detergent and water. Rinse solution shall be potable water. Decontamination and rinse solutions shall be disposed on site under the supervision of the site HSO.

Decontamination of drill rigs, vehicles, equipment and ancillary tools and sampling devices shall consist of removal of contaminated soil and mud, and steam cleaning. All vehicles and equipment shall be cleaned before relocation to and use at any other sampling site or work area.

C. Medical Emergencies

For physical injuries, first aid treatment shall be given at the site, depending upon the seriousness of the injury. The victim should undergo decontamination, if necessary, unless such procedures interfere with necessary treatment. In life-threatening situations care shall be instituted immediately. Protective clothing shall be removed or cut away if this will not cause delays, interfere with treatment, or aggravate the problem. If contaminated protective clothing cannot be removed, wrap the victim in clean materials to help prevent contamination of medical personnel and ambulances.

For chemical exposure emergencies, decontamination procedures

shall be followed unless severe medical problems requiring life sustaining measures are evident.

D. First-Aid

In the event of injury, the emergency shall be handled according to the procedures described in the Emergency Procedures Section. First-aid kits shall be maintained at the control access point between the decontamination and support zones and in support vehicles.

If the victim cannot be safely moved from the contamination area, first aid necessary to stabilize the victim for safe transport shall be administered at the accident location. Appropriate decontamination of all clothing and equipment shall be followed upon leaving the contaminated area.

E. Inhalation Protection

For any site chemical exposure emergency, respirators equipped with HEPA/organic vapor combination cartridges shall be required before entering any area where organic vapors exceed 1 ppm as determined by an OVA. If the organic vapor concentrations are unknown, all site personnel shall use air-supplied respirators when entering any area to rescue a victim suspected of being exposed to excessive organic vapors.

12.0 EMERGENCY PROCEDURES

Some risk of personal injury or chemical exposure is inherent in hazardous waste site activities. These risks and the effects of unpredictable events such as injury, chemical exposure, fire or explosion shall be minimized by:

- Adhering to good work practices,

- Using personal protective equipment appropriate for existing field conditions,
- Performing adequate monitoring of individuals and ambient field conditions,
- Staying alert both to personal performance and to that of co-workers.

An emergency situation is considered to exist if:

- Any member of the field crew is injured in an accident,
- Any member of the field crew experiences or exhibits any adverse effects or symptoms of chemical exposure,
- Safety monitoring indicates site conditions more hazardous than anticipated or that an immediate danger to life or health exists.

A. General Emergency Procedures

- In the event that any member of the field crew experiences any adverse effects or symptoms of exposure while on the scene, the entire field crew shall immediately halt work and act according to the instructions provided by the site HSO.
- The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated, shall result in the evacuation of the field team and re-evaluation of the hazard and the level of protection required.
- In the event that an accident occurs, the site HSO is to complete an Accident Report. Follow-up action shall be taken to correct the situation that caused the accident.

B. Personal Injury

Site personnel are trained in American Red Cross first-aid procedures and shall administer appropriate first aid treatment, including CPR, in emergency situations. The following general emergency procedures shall be carried out in the event of injury:

1. Notify the HSO of the incident.

2. If the victim can be moved safely, remove from the contaminated zone to the decontamination zone using established control points.

3. Administer first-aid.

4. Transport victim to nearest hospital or emergency medical center or call for ambulance transport, as appropriate.

NOTE: The site HSO shall direct the removal of injured personnel from the contaminated zone and shall approve any necessary deviation from established decontamination procedures. Such deviation shall be based upon the severity or life threatening nature of the injury.

5. Notify the Vickery site HSO of the incident and describe the emergency response actions taken.

C. Chemical Exposure

Before entering the contaminated zone, all site personnel shall be thoroughly acquainted with the types of toxic/hazardous chemicals present on site and their potential concentrations. The following general procedures shall be followed for chemical exposure emergencies:

1. Move the victim from the immediate area of exposure or contamination, taking precautions to prevent additional exposure of other individuals.

2. Notify the site HSO of the exposure incident.

3. If victim can be moved safely, proceed to the decontamination zone through established control points.

4. Decontaminate clothing or remove if safe to do so.

   - For skin or eye contact, thoroughly wash affected areas with water (eyes should be flushed for at least 15 minutes).

   - For inhalation exposure, ensure that victim has adequate fresh air.

5. Administer additional first aid treatment as appropriate.

6. Transport victim to nearest hospital or emergency medical center or call for ambulance transport as appropriate.

7. Notify the HSM of the incident and describe the emergency response actions taken.

NOTE: The HSO shall direct the removal of injured personnel from the contaminated zone and shall approve any necessary deviation from established decontamination procedures. Such deviation shall be based upon the security or life threatening nature of the injury.

D. Fire or Explosion

In the event of a fire or explosion:

1. Immediately evacuate injured personnel and leave the area,

2. Administer first aid as appropriate,

3. Notify emergency services,

4. Notify the Vickery site HSO.

E. Primary Emergency Contacts

The appropriate contact(s) from the following list shall be made for all emergency situations.

Primary Emergency Contacts	Telephone
Fire	(419) 547-7123
Ambulance	(419) 334-4401
Sheriff	(419) 332-2613
Fremont Memorial Hospital	(419) 332-7321

Call 911 During An Emergency

For ambulance, fire or police contacts, give the name of the road and the nearest intersection. In the event no telephone can be reached, Channel 9 can be accessed with a Citizens' Band (CB) Radio for emergency assistance.

Notify the client contact and the Vickery site HSO after primary emergency contacts have been made. The PPE Manager should be contacted if unforeseen circumstances require the immediate procurement of additional personal protective equipment.

Attending emergency physicians should be given the telephone number of the Vickery site HSO Medical Director to obtain immediate access to an employee's medical records and for consultation purposes.

The telephone number of these secondary contacts are listed below:

Project Contact	Telephone
Vickery - General Manager	(419)547-7791
Vickery - Operations Manager	(419)547-7791
Vickery - Health & Safety Manager	(419)547-7791

G. Spill Control Contingency Plan

Solid materials that are spilled will be scooped up, placed in appropriate containers, and held for disposal. Wherever possible, samples will be obtained from above the liquid level in all tanks and barrels to limit spill potential. Appropriate temporary spill containment will be erected prior to sampling any liquid containing vessel from below the liquid level. Spilled liquids will be neutralized or containerized and held for disposal. Prior to spill clean up, the site HSO will be consulted to assure that employees are protected during the work.

13.0 TRAINING OF PERSONNEL

To remain in compliance with OSHA regulations, all personnel whose duties include participation in job-related activities on these sites, must be able to document "a minimum of 40 hours of

initial instruction off the site, and a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor." Site-specific training shall be carried out by the site HSO prior to entry into the site. This shall consist of a review of the specific hazards of concern, risks, symptoms of exposure and an overview of the health and safety plan to include delineation of work zones, access, decontamination protocols, safety procedures and emergency contacts.

Any personnel not initially cleared for site entry will be provided a similar briefing at the site by the HSO before admittance into the Exclusion Zone is permitted.

The OSHA regulations provide that if previous training can be demonstrated equivalent to the OSHA initial training requirements, this shall be considered as meeting those requirements. Equivalent training includes the training that employees might have already received from actual, on-site work experience.

14.0 MEDICAL SURVEILLANCE

Vickery's site HSO provides medical surveillance support for numerous ongoing operations. The Medical Surveillance Program is the core element of the Vickery Health and Safety Plan. It provides for employee assurance as well as liability protection. The intent of this program is to detect deleterious consequences of occupational exposure to hazardous substances and physical stresses, particularly those associated with the work environment at hazardous waste sites. The Surveillance Program is designed to monitor specific physiological conditions and mechanisms that may be affected by non-episodic exposure as well as to provide acute or episodic medical care as needed.

At a hazardous waste site, the most obvious threat to workers may be the potential exposure to hazardous chemicals. A rational, well managed PPE Program will minimize these exposures to the extent that exposure remains within safe limits. Medical surveillance is necessary, however, for several reasons. First, no matter how diligent are the training, supervision and maintenance efforts, incorrect use and the malfunction of PPE remains possible. In addition, no one piece of protective equipment is capable of providing protection against all threats, and no PPE is capable of providing absolute protection against even one threat, or for prolonged periods of time at a given level of threat. Finally, there are the less obvious threats inherent in the use of PPE. These include the inhibition and added physiological burden of wearing suits, gloves, boots, respirators, etc., while performing other tasks that of themselves may be strenuous. Also, vapor barrier protective clothing can prevent evaporation of sweat thus causing metabolic heat to be stored in the body and creating the threat of heat injury.

The Vickery Medical Surveillance Program has been developed using OSHA, NIOSH, EPA, CDC, USCG, university, and industrial data sources to address the categories of hazards outlined above, and specifically in those manifestations that may be encountered in hazardous waste operations by Vickery personnel.

All personnel working on these sites will have had a pre-employment physical examination (meeting the requirements of 1910.120) conducted by an occupational health physician and, on the basis of this examination, will have been certified as being fit for duty on potentially hazardous sites.

In additional to the pre-employment and periodic examinations (meeting the requirements of 1910.120), the Vickery Medical

Surveillance Program includes provisions for pre-placement, periodic and exit examinations for specific sites with identifiable hazards of high potential exposure levels. However, at these sites, the hazard assessment and risk analysis presented in Sections 4 and 5 of this health and safety plan do not indicate health risks sufficient to warrant this additional monitoring beyond the baseline medical data maintained by the standard program.

Unscheduled medical examinations will be conducted, however, in the unlikely event of unusual exposures or accidents.

All medical records are maintained by Vickery and are accessible, within the limits of the Privacy Act, through written requests to the Vickery.

15.0 RECORDKEEPING

Vickery shall maintain logs and reports sufficient to document the implementation and execution of the personnel protection program. This documentation shall consist of medical surveillance files, training files, daily logs and accident reports.

Medical Surveillance

Confidential medical surveillance files are maintained by Vickery. These files document employee participation in the medical surveillance program and fitness to work on hazardous sites. Vickery maintains medical records. Access to these files and records is controlled by Vickery.

Training

Documentation of employee training is maintained. These files document employee attendance, level of training and follow-up or refresher instruction.

Work Logs

Daily work logs shall be maintained by the site HSO. Copies of daily logs shall be forwarded to the Contracting Officer on request. The daily log shall contain:

- Date,
- Area(s) or site(s) worked,
- List of employees by area and hours exposed,
- Personal protective equipment utilized by employees,
- Results of monitoring tests,
- Waste materials removed from work area(s),
- List of equipment decontaminated,
- Description of special or unusual events or incidents, including all first aid treatments not otherwise reportable.

Daily work logs shall be checked and approved by the site HSO. Any incident resulting in a work stoppage shall be fully documented in a report prepared by the site HSO and submitted to the HSM.

Accident Reporting

In addition to descriptions in the daily log and work stoppage reports, any accident and/or chemical exposure incident shall be investigated, analyzed and documented in an accident investigation report submitted to the site HSO. This process shall be applicable to both Vickery and all subcontractors. These reports, prepared by the site HSO, shall contain a full description and analysis of the incident, including exposure work-hours and a log of occupational injuries and illnesses (OSHA Form 200 or equivalent as prescribed by 29 CFR 1904).

Formal accident reports shall be prepared for any diagnosed illness or injuries that result in a lost work day or fatality. The accident report shall identify all contributing causes and recommend future hazard control measures to reduce the risk of recurrence.

Persons on site are responsible for reporting all injuries as soon as possible to the site HSO.

16.0 JOB EXPOSURE REPORT

The HSO shall complete the attached Job Exposure Report Form at the termination of field activities on the site, in the event of assignment of a new HSO at an intermediate point during site activities, or at the ends of discrete phases of prolonged field activities. The intent of Job Exposure Reports is to provide documentation of actual and/or suspected job-related exposures for use in making decisions on appropriate periodic examination procedures.

Each Job Exposure Report shall be countersigned by the Project Manager who should ensure appropriate compliance with this procedure. In addition, all Job Exposure Reports are reviewed by a Certified Industrial Hygienist to ensure that any actual exposures are adequately defined.

JOB EXPOSURE REPORT

Project Name Project Number

Site Location

Employees on-site:

Name	Site Function	Dates of Site Participation

Were all PPE, monitoring and decontamination procedures carried out in accordance with the provisions of the Site Health and Safety Plan?

Yes _____ No _____

If no, please state how procedures varied from provisions of the Health and Safety Plan, the justification or authority if appropriate, the dates of variance, and if the variance resulted in any known or suspected chemical or radiological exposure. If additional space is needed, please continue on the back of this form.

Please describe any known or suspected exposure that may have occurred during the period of site activities from accidents, unanticipated incidents or failures of personal protective equipment.

HSO Signature Witness

Date

Project Manager

Date

APPENDIX A

PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

FULL BODY PROTECTION
- Tyvek - no boots or hood (dusty conditions)
- Tyvek - boots and hood attached (dusty conditions)
- Saran coated Tyvek - no boots or hood (wet/splash conditions)
- Saran coated Tyvek - boots and hood attached (wet/splash condition)
- Other

HEAD PROTECTION
- Safety Hard Hat
- Hard Hat Liner
- Splash/Rain Hood
- Hair Covering

EYES AND FACE PROTECTION
- Face Shield
- Splash Hood
- Safety Glasses (drilling operations)
- Goggles (dusty conditions)
- Sweat Bands (optional)

HEARING PROTECTION
- Ear Plugs (noisy conditions)
- Ear Muffs (optional)
- Both Plugs and Muffs

EQUIPMENT
- OVA
- HNu or TIP II
- Combustible Gas Indicator (CGI)
- CGI with H2S Monitor
- Radiation Survey Meter
- Detector Tubes
- Other

FREQUENCY OF MONITORING
- Continuously (sampling operations)
- Every 15 Minutes (sampling operations)
- Every 30 Minutes
- Every Hour
- Other

RESPIRATORY PROTECTION LIMITS

1	ppm, Upper Limit Without Respirator
10	ppm, Upper Limit With Half-Mask Respirator
50	ppm, Upper Limit With Full-Face Respirator

NOTE: ABOVE 700 PPM REQUIRES SITE EVACUATION/CONCENTRATION PRESENTS EXPLOSION AND FLAMMABILITY POTENTIAL

HAND PROTECTION
- Nitrile Gloves
- Neoprene Gloves
- Vinyl - PVC Gloves
- Viton Gloves
- Silver Shield Gloves
- Kevlar Gloves
- Cotton Over-Gloves
- Insulated Work Gloves
- Other

FOOT PROTECTION
- Regular Leather Work boots
  - Plain
  - Steel-Toe
  - Steel-Shank
  - Insulated
- Neoprene Overshoe
  - Ankle High
  - Calf High
- Neoprene Boot
  - Plain
  - Steel-Toe
  - Steel-Shank
- PVC Boot
  - Plain
  - Steel-Toe
  - Steel-Shank
- Butyl Rubber Boot
  - Plain
  - Steel-Toe
  - Steel-Shank
- Other

GENERAL

- Knife
- Flashlight
- Safety Belts
- Safety Harness
- Lifeline
- Cooling Jacket
- Life Jacket
- Eyewash
- Spray Bottle - Container
- Fire Extinguisher
- Thermometer
- Botsball
- First-Aid Kit
- Disposal Bags
- Cooler with electrolyte replacing drink
- Cooler with Water

APPENDIX D

Cover System Configuration and Construction Procedures for Contingent Closure

APPENDIX D

Cover System Configuration and Construction Procedures for Contingent Closure

In the event contingent closure is necessary, the following text describes the configuration and construction procedures for the final cover system for the V-Tank and Filtered Acid Tank (FAT) areas. Typical plan views for closure of these areas are presented on Figures 1 and 2. A cover system cross-section detail that presents the various cover system components is presented on Figure 3. The proposed cover system configuration is common for RCRA closure, and this closure system will meet the requirements of the Ohio EPA Closure Plan Review Guidance (September 1993).

The cover system will consist of the following components (presented in ascending order):

- two-foot thick compacted clay layer;
- 40-mil thick high-density polyethylene (HDPE) geomembrane layer;
- synthetic drainage layer (geonet);
- geotextile layer to limit migration of soil particles into the geonet; and,
- vegetated soil layer.

The compacted clay layer and HDPE membrane will provide an effective infiltration barrier to minimize migration of liquids through underlying soils. The clay layer will be covered by a minimum of 3.5 feet of soil to allow growth of vegetation and to protect the compacted clay from freezing temperatures. Surveys will be performed after backfill of the containment area, after placement of the compacted clay layer, and after placement of the final cover soil to ensure that the specified depths are achieved for the clay layer and overlying soils.

The geonet drainage layer will allow drainage off the cover for water that infiltrates through the vegetative layer. The geonet drainage layer will terminate at a stone drain at the edge of the cover system as presented on Figure 3. The vegetated surface of the cover system will protect the cover from erosion and will minimize maintenance.

Excessive differential settlement or subsidence of the cover system after construction is not expected because the backfill under the cover system will be compacted. The cover system will not be constructed above decomposing wastes similar to those found in a typical solid waste landfill, so settlement of soil materials below the backfill is not likely. Therefore, the cover system slopes should remain relatively constant after construction, and damage to cover system materials or excessive stress on the cover system due to settlement are not likely.

The top portion of the cover system will have a minimum slope of three percent to allow surface drainage of precipitation from the cover system, with the side slopes at a maximum rate of slope of three feet horizontal to one foot vertical (3:1). The maximum length of the 3:1 side slopes will only be approximately 15 feet, so excessive erosion of cover soil and slope instability are not expected.

1. Construction Mobilization and Site Preparation

During the mobilization/site preparation period, installation of silt fence, construction of access driveways/tire cleaning pads, and other site preparation activities will be performed, if necessary. In addition, materials and equipment necessary for closure system construction will be delivered to the site.

2. Tank and Containment Area Demobilization

The V-Tanks and FATs will be decommissioned as described in Sections 6.2.1 and 6.4.1 of the RCRA Part B Permit Application. After the tanks and associated piping within the containment areas are cleaned and removed, the concrete containment structures will be demolished. Eight soil samples, in addition to those samples previously collected, will be collected from each tank area. Each sample will be analyzed for the parameters listed in the Action Plan. Backfill of the tank/containment void volume and construction of the cover system will proceed after collection of these soil samples.

The void remaining after removal of the tanks and containment structures will be backfilled with general earthfill material and compacted in 12-inch lifts to 85 percent of the general earthfill maximum density as determined by ASTM D-1557 (Modified Proctor compaction test).

3. Clay and Other Fill Materials

Soil materials to be used for the closure include clay, general earthfill, select fill, and topsoil. These materials will be used to construct the cover system as presented on Figures 1 through 3. Soils will be segregated in piles adjacent to each work area to limit inadvertent mixing of materials.

Clay soil will be free of debris, excessive coarse particles, or other deleterious materials. Soils with a visibly identifiable organic content, or soils classified according to the Unified Soil Classification System as organic silt or organic clay (OL, OH) will not be used for the clay layer component of the cover system.

General earthfill consists of random, granular or cohesive material taken from on site excavations, but if on site material proves insufficient, the material will come from off-site

excavations. The material includes a broad range of soils relatively free of organics, debris, or other deleterious matter which can be used for the purpose of earthfill construction.

Select fill material consists of soils with particles of a size and shape that will not damage the geonet and synthetic membrane. This material will be placed immediately above the geotextile.

Topsoil generally consists of medium-textured soil that is capable of supporting vegetative growth.

The total volumes of soil in cubic yards (cy) required for each typical closure area are as follows:

Soil Type	V-Tank Vol. (cy)	FAT Vol. (cy)
Clay	90	70
General Earthfill /Select Fill	1,200	830
Topsoil	115	100

The general earthfill/select fill volume presented above includes the backfill required for the tank containment.

4. Cover System Component Construction

The material testing and construction procedures to be followed during construction of the cover system components are described below. All testing and construction will be performed in accordance with the requirements of the Vickery Quality Assurance Guidance Document for the Installation of Lining Systems.

4.1 Clay Layer

Prior to the construction of the clay layer, soil evaluation

tests will be performed to confirm the adequacy of the clay material. All tests will be performed in a geotechnical laboratory or in the field as required. Previous testing and evaluations of the soil sources may also be used to evaluate the soil material. At a minimum, the following tests will be conducted:

- Moisture content (ASTM D2216);
- Particle size (ASTM D1140, D422);
- Atterberg limits (ASTM D4318);
- Laboratory compaction (ASTM D1557 for Modified or ASTM D698 for Standard);
- Laboratory hydraulic conductivity at a specified compaction (ASTM D5084).

Particle size tests will be performed at a frequency of one per 1,000 cy of clay material, or upon visual changes in the material type. The other tests will be performed at a frequency of one per 5,000 cy of clay material, or upon visual changes in the material type. Due to the relatively low volume of clay required for closure of one or even all of the tank areas, probably only one soil sample will be required for the clay source. Previous soil testing and evaluations also may be used in determining testing frequencies.

Construction of the clay layer will not occur during heavy rain or snow, high winds, or while the subgrade or clay material is frozen. The clay layer will have a total thickness of two feet and will consist of clay compacted in six-inch lifts.

Observation of the soil liner construction will be coordinated with construction testing. At a minimum, the following will be observed and recorded during construction of the clay layer:

- Moisture content and consistency of the soil during placement and compaction;
- Type and level of compactive effort (roller type, roller weight, number of coverages);
- Action of compaction equipment on the soil surface (sheepsfoot penetration, pumping, cracking, etc.);
- Maximum clod size;
- Loose and compacted lift thickness;
- Method of bonding lifts together;
- Stones which may damage overlying geosynthetic components; and,
- Areas where damage due to excess moisture, insufficient moisture, freezing, or excessive desiccation may have occurred.

The following field tests will be performed on each lift of the compacted clay layer:

- Field moisture content (ASTM D2216 or D3017);
- Field density (ASTM D2922, D1556, D2167, or D2937).

These field tests will be performed at a frequency of one per 10,000 square feet area or less. This will likely equate to one test per lift for each tank area to be closed. All perforations of the clay layer due to testing will be backfilled with bentonite, a mixture of bentonite and soil or compacted clay material. Compaction will be performed with a tamping rod, Modified or Standard Proctor hammer, or a hand tamper.

Laboratory hydraulic conductivity tests (ASTM D5084) will be performed to confirm the soil in the compacted clay layer exhibits a hydraulic conductivity of less than 1.0×10^{-7} centimeters per second (cm/sec). One laboratory hydraulic conductivity test will

be performed per tank closure area.

4.2 Geomembrane Layer

After completion of the clay layer construction, the 40-mil HDPE geomembrane layer will be installed. The geomembrane will not be placed on clay that has become softened by precipitation or that has cracked due to desiccation. The soil surface will be observed daily to evaluate desiccation cracking and/or softening. Any damage to the clay layer due to desiccation cracking or softening will be repaired prior to placement of the geomembrane. Geomembrane placement will occur when the ambient temperature is between 32°F and 104°F, and will not occur during any precipitation event or in the presence of excessive winds.

Field seaming of the geomembrane will be accomplished by extrusion welding or fusion welding. Only seaming apparatus of a make and model which have been specifically approved by the geomembrane manufacturer will be used.

4.2.1 Trial Seams

Trial seams will be made on fragment pieces of geomembrane to verify that seaming conditions are adequate. Such trial seams will be made at the beginning of each seaming period, and at least once each five hours, for each seaming apparatus used that day. Trial seams will be made under the same conditions as actual seams. The trial seams will be a minimum of five feet long by one foot wide (after seaming) with the seam centered lengthwise.

The specimens will be tested in shear and peel using a field tensiometer. At least four specimens will be tested, each in both shear and peel. A passing test will meet the minimum acceptable values in at least four of the five specimens tested for each method. If a specimen fails, the entire trial seam operation will

be repeated. If the additional specimen fails, the seaming apparatus will not be used for seaming until the deficiencies are corrected and two consecutive successful trial seams are achieved.

4.2.2 Nondestructive Seam Continuity Testing

All installed geomembrane seams will be tested nondestructively along their entire length using an air lance, air pressure test (for double fusion seams only), a vacuum test or other approved method. Continuity testing will be carried out as the seaming work progresses, not at the completion of all field seaming.

Air pressure testing is applicable to double fusion welding which produces a double seam with an enclosed space. If double fusion seams are used, the equipment for air pressure testing will consist of the following:

- An air pump (manual or motor driven), equipped with a pressure gauge and mounted on a cushion to protect the geomembrane;
- A rubber hose with fittings and connections; and,
- A sharp hollow needle, or other pressure feed device.

The following procedures will be used for air pressure testing:

- Seal both ends of the seam to be tested;
- Insert needle or other approved pressure feed device into the air channel created by the fusion weld;
- Insert a protective cushion between the air pump and the geomembrane;
- Pressurize the air channel, close valve, allow for pressure to stabilize, and sustain pressure;

- If loss of pressure exceeds the maximum permissible pressure differential or does not stabilize, locate faulty area and vacuum test. If the vacuum test fails, repair the seam;

- Cut opposite end of tested seam area once testing is completed to verify continuity of the air channel. If air does not escape, locate blockage and retest unpressurized area. Seam the cut end of the air channel; and,

- Remove needle or other approved pressure feed device and seal the hole in the geomembrane.

Vacuum testing is applicable to any type of seam. The equipment for vacuum testing will consist of the following:

- Vacuum box assembly consisting of a rigid housing, a transparent viewing window, a soft neoprene gasket attached to the bottom, a porthole or valve assembly, and a vacuum gauge;

- Pump assembly equipped with a pressure controller and pipe connections;

- Rubber pressure/vacuum hose with fittings and connections;

- Soapy solution that will allow the creation of bubbles when air is passed through;

- Bucket and wide paint brush, or other means of applying the soapy solution.

The following procedures will be used for vacuum testing of seams:

- Wet a soapy strip of geomembrane approximately 12 inches x 48 inches with the soapy solution;

- Place the box over the wetted area;

- Close the bleed valve and open the vacuum valve;

- Ensure that a leak-tight seal is created;

- Energize the vacuum/venturi pump and reduce the applied pressure to approximately five pounds per square inch (psi) gauge;

- For a minimum of ten seconds, apply vacuum with the box placed and maintaining a seal, examine the geomembrane through the viewing window for the presence of soap bubbles;

- If no bubble appears after ten seconds, close the vacuum valve and open the bleed valve, move the box over the next adjoining area with a minimum three inch overlap, and repeat the process; and,

- All areas where soap bubbles appear will be marked and repaired.

4.2.3 Destructive Testing

Destructive seam tests will be performed at a frequency of one test per 500 feet of seam length to evaluate seam strength. This testing will occur as the seaming work progresses, not at the completion of all field seaming. All holes in the synthetic membrane resulting from the destructive seam sampling will be immediately repaired and nondestructively tested.

The destructive test samples will be at least 12 inches wide by 42 inches long with the seam centered lengthwise. One 1-inch wide strip will be cut from each end of the sample and these strips will be tested in the field with a tensiometer for peel and shear. The remaining portion of the sample will be used for laboratory testing in accordance with ASTM D-638 and D-413.

4.2.4 Seam Repair

Any seam exhibiting a flaw or failing a destructive or nondestructive test will be repaired. The repair procedure will depend on the type of failure and the location of the seam. Possible repair procedures include the following:

- Patching, used to repair large holes, tears, undispersed raw materials, and contamination by foreign matter;
- Spot welding, used to repair pinholes, or other minor, localized flaws;
- Capping, used to repair large lengths of failed seams;
- Extrusion welding the flap, used to repair areas of inadequate fusion seams which have an exposed edge;
- Removing a bad seam and replacing with a strip of new material welded into place, used with a large length of fusion seam.

All surfaces will be clean and dry at the time of repair. Surfaces of the geomembrane that will be repaired using extrusion methods will be ground prior to repair. Patches or caps will extend at least six inches beyond the edge of the defect, and all corners of patches will be rounded with a radius of at least three inches. Each repair will be numbered and logged, and will be nondestructively tested. Repairs which pass the nondestructive test will be taken as an indication of an adequate repair.

4.4.3 Drainage Layer

The geonet drainage layer will be placed above the geomembrane. The geonet will have a minimum transmissivity of 1×10^{-3} square meters per second (m^2/sec). The geonet will be installed in accordance with the following criteria:

- On slopes, the geonet will be secured and rolled down the slope in such a manner as to continually keep the geonet sheet in tension. If necessary, the geonet will be positioned by hand after being unrolled to minimize wrinkles;
- In the presence of wind, all geonet will be weighted with sand bags or the equivalent. Such sand bags will be installed during deployment and will remain until replaced with cover material;

- Unless otherwise specified, geonet will not be welded to geomembrane;

- Geonet will only be cut using scissors or other cutting tools that will not damage the underlying geosynthetics. Care will be taken not to leave tools in the geonet;

- The installer will take any necessary precautions to prevent damage to underlying layers during placement of the geonet; and,

- During placement of geonet, care will be taken not to entrap dirt or excessive dust in the geonet that could cause clogging of the drainage system, and/or stones that could damage the adjacent geomembrane. If dirt or excessive dust is entrapped in the geonet, it will be cleaned prior to placement of the next material on top of it. In this regard, care will be taken with the handling of sand bags, to prevent puncturing of the sand bags.

At a minimum, the following requirements for joining the adjacent rolls of geonet will be met:

- Adjacent rolls will be overlapped by at least four inches;

- The geonet overlaps will be tied with plastic fasteners. Tying devices will be white or yellow for easy inspection. Metallic devices will not be allowed;

- Tying will be every five feet along the length at the adjacent rolls, every six inches in the anchor trench and every six inches along end-to-end seams; and,

- In general, no horizontal seams will be allowed on side slopes, except as part of a patch. When horizontal seams are necessary, they will be offset in adjacent panels and will be "shingled" downhill.

Any holes or tears in the geonet will be repaired by placing a patch extending one foot beyond the edges of the hole or tear. The patch will be secured to the original geonet by tying every six inches. If the hole or tear width across the roll is more than half of the width of the roll, the damaged area will be cut out and

the two portions of the geonet will be joined.

Soil will not be placed in direct contact with geonet. Soil materials above the geonet will be placed in such a manner as to ensure:

- The geonet and underlying materials are not damaged;
- Minimal slippage of the geonet on underlying layers; and,
- No excess tensile stresses occur in the geonet.

4.4.4 Geotextile

Non-woven geotextile will be placed above the geonet to prevent soil particles from clogging the geonet. During shipment and storage, the geotextile will be protected from ultraviolet light exposure, moisture, mud, dust, puncture, cutting, or any other damaging or deleterious conditions.

The geotextile will be deployed as described below:

- On slopes, the geotextile will be securely anchored and then rolled down the slope in such a manner as to continuously keep the geotextile sheet in tension;
- In the presence of wind, all geotextile will be weighted with sand bags or the equivalent. Such sand bags will be installed during deployment and will remain until replaced with cover material;
- Geotextile will be cut using a geotextile cutter (hook blade) only. If in place, special care will be taken to protect other materials from damage which could be caused by the cutting of the geotextile;
- The installer will take any necessary precautions to prevent damage to underlying layers during placement of the geotextile; and,
- During placement of geotextile, care will be taken not to entrap, in or beneath the geotextile, stones, excessive

dust, or moisture that could damage the geomembrane, cause clogging of the geonet, or hamper subsequent seaming.

Geotextile will be overlapped a minimum of three inches prior to seaming. In general, no horizontal seams will be allowed on side slopes (seams along, not across, the slope) except as part of a patch. When horizontal seams are necessary, adjacent seams will be offset in adjacent panels and will be "shingled" downhill.

Any sewing will be done using polymeric thread with chemical and ultraviolet light resistance properties equal to or exceeding those of the geotextile. The color of the sewing thread will contrast the background color of the geotextile.

Any holes or tears in the geotextile will be repaired as follows:

- On the side slopes, a patch made from the same geotextile will be thermally bonded or sewn into place.
- On the top portion of the cover system, a patch made from the same geotextile will be thermally bonded or sewn in place with a minimum of 12 inch overlap in all directions.

After placement of the geotextile, the entire geotextile area will be inspected for the presence of foreign objects, such as needles, that could damage the underlying geonet or geomembrane. Soil materials above the geotextile will be placed in such a manner as to ensure:

- The geotextile and underlying materials are not damaged;
- Minimal slippage of the geotextile on underlying layers; and,
- No excess tensile stresses occur in the geotextile.

4.4.5 Select Fill/General Earthfill/Topsoil

As described above, the clay and geosynthetic layers will be covered by a minimum of 3.5 feet of soil to allow growth of vegetation and to protect the compacted clay from freezing temperatures. The select fill, general earthfill, and topsoil materials to be used for this purpose are described above in Section 3.

Select fill will be placed directly above the geotextile to prevent damage to the underlying geotextile, geonet or geomembrane. The depth of select fill placement will be a minimum of six inches. General earthfill material will be placed above the select fill to an elevation three feet above the geotextile. Topsoil will be placed above the general earthfill to allow establishment of vegetation. One soil material may be used instead of the three soil materials described above if the one soil has particles of a size and shape that will not damage the geotextile, geonet or geomembrane, and if that soil can adequately sustain a vegetated cover. These soil materials (or material) will be placed with care so that the underlying geosynthetic materials will not be subjected to slippage between layers, excessive tensile stresses or other damage.

4.6 Establishment of Vegetation

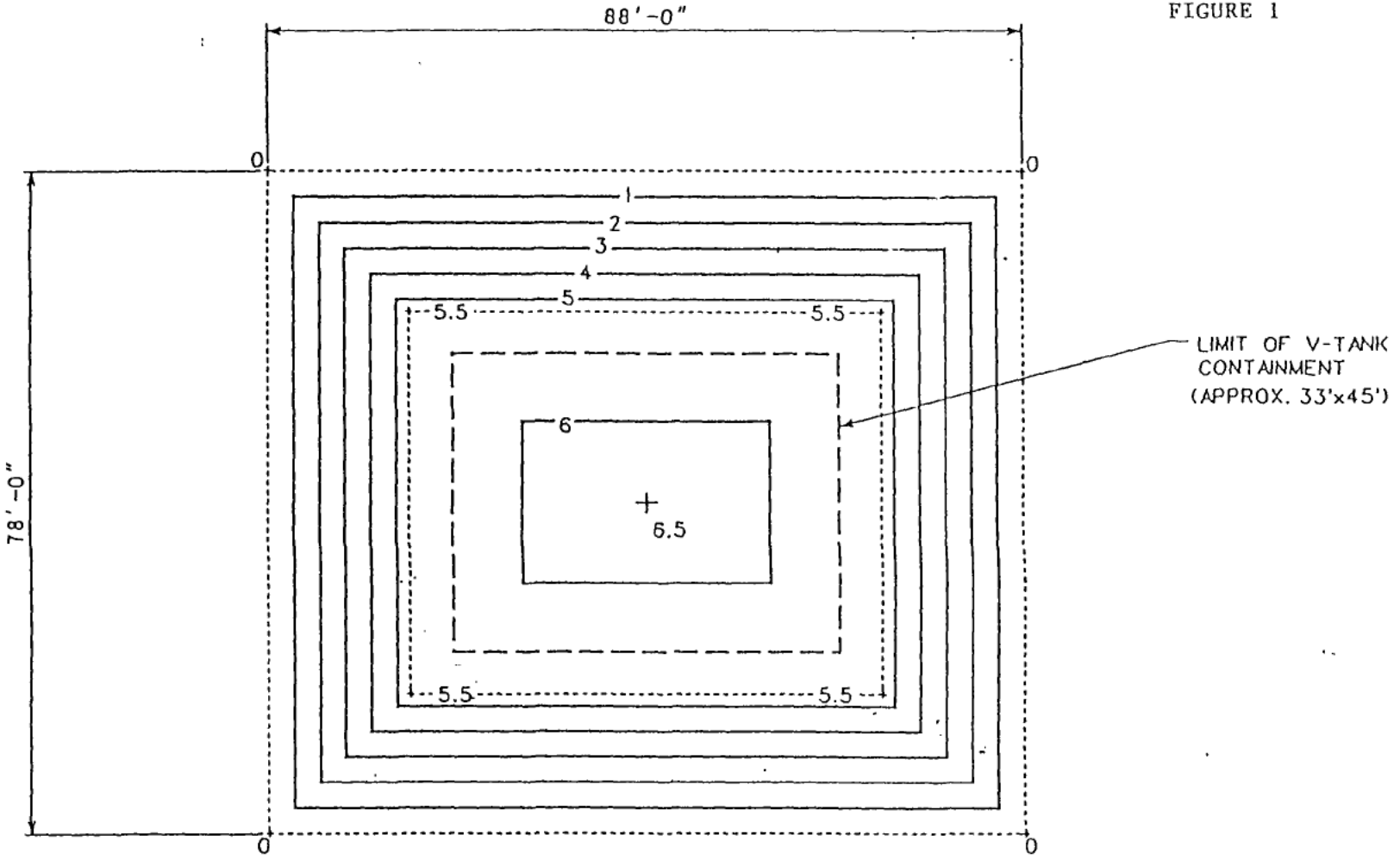
After placement of the full depth of soil on the geosynthetic materials, the soil surface will be prepared for planting of grass cover. If necessary, the surface soils will be raked to break large soil clods and to remove stones or other deleterious materials. Lime and/or fertilizer will be applied to the soil as necessary. A seed mix appropriate for the area and time of year will be determined after consultation with the local Soil Conservation District.

After the grass cover is fully established, it will be mowed a minimum of three times per year. Trees, shrubs or any other plant with the potential to develop deep, strong roots will not be allowed to grow on the cover system to eliminate the potential for damage to the geotextile, geonet or geomembrane.

5. Construction Schedule

The actual time required for cover system construction will depend on the number of areas to be closed in the manner described above. Certain efficiencies may be realized if more than one area is to be closed, so construction of two cover systems may not require twice as much time as closure of just one area. The number of cover systems to be constructed, if any, is not known at this time, so the amount of time required to close just one typical area has been estimated for this document. The estimated construction schedule for construction of a typical cover system is expected to require approximately three weeks.

FIGURE 1



LEGEND:

• 6.5 SPOT ELEVATION RELATIVE TO SURROUNDING GRADE

—5— ELEVATION CONTOUR RELATIVE TO SURROUNDING GRADE

894

0 20' 40'

SCALE IN FEET

RUST

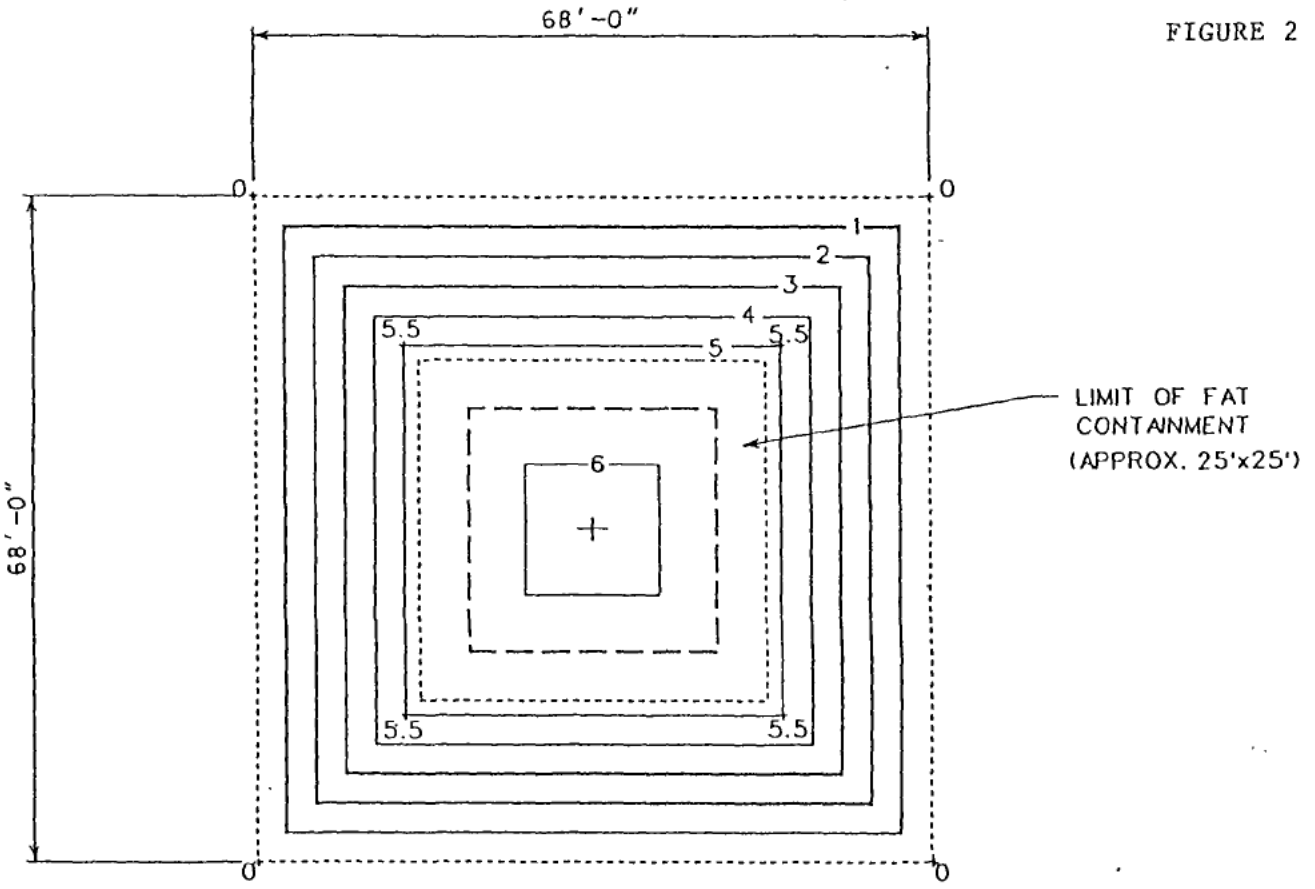
Rust Environment & Infrastructure Inc.

TYPICAL FINAL GRADES
V-TANK AREA

Vickery, Ohio

4/15/99

FIGURE 2



4/15/99

LEGEND:

+ 5.5 SPOT ELEVATION RELATIVE TO SURROUNDING GRADE

—5— ELEVATION CONTOUR RELATIVE TO SURROUNDING GRADE

895

0 20' 40'

SCALE IN FEET

RUST

Rust Environment & Infrastructure Inc.

TYPICAL FINAL GRADES
FILTERED ACID TANKS(FATs)

kery, Ohio

FIGURES.JTP

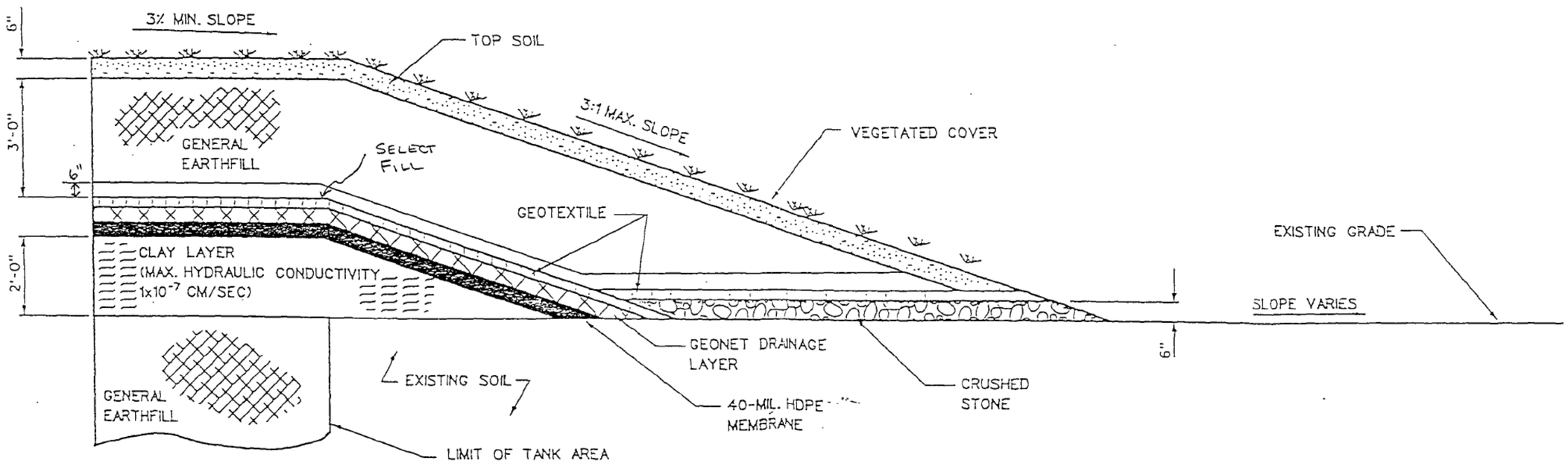


FIGURE 3

896

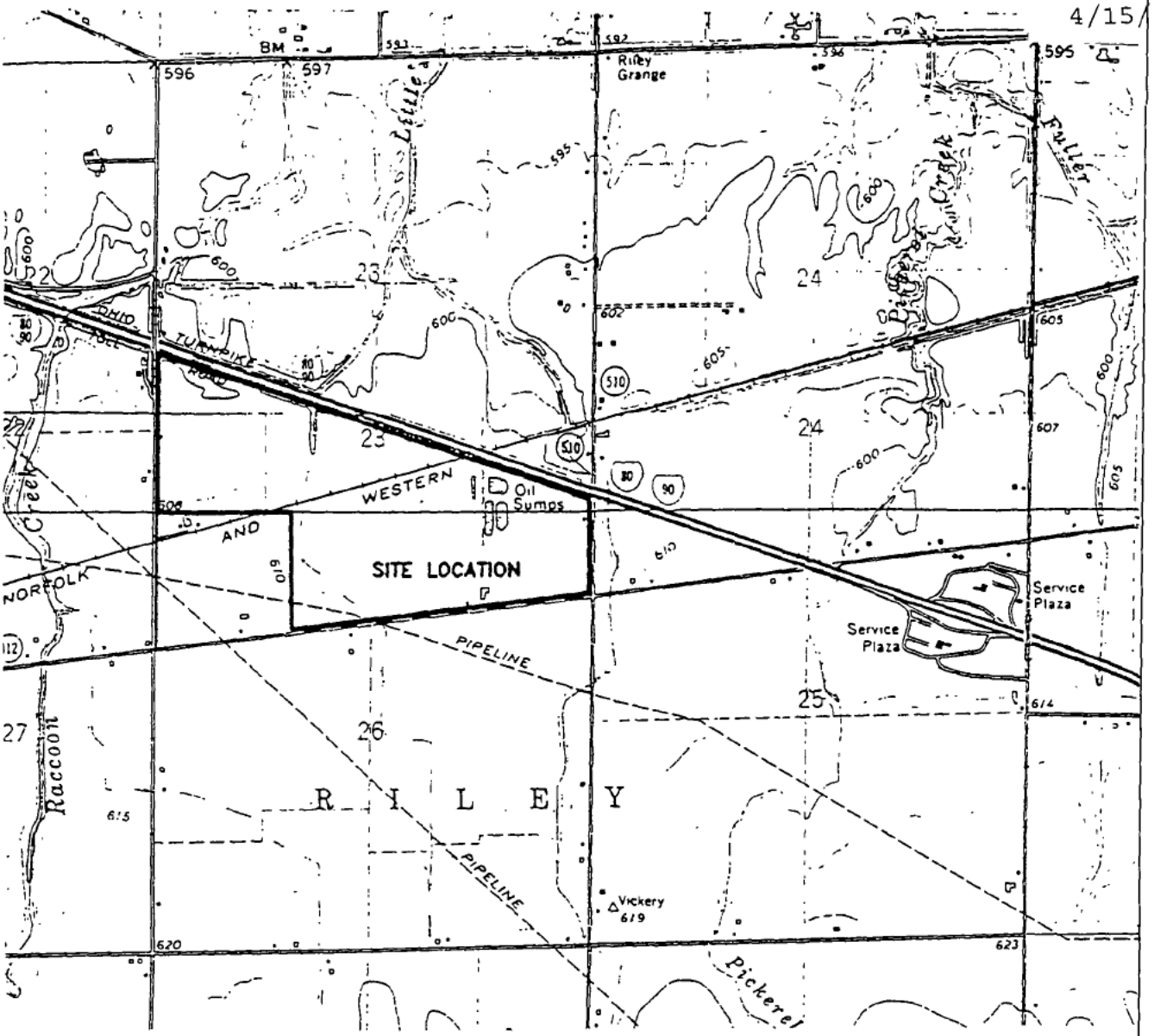
Rust Environment & Infrastructure Inc.

COVER SYSTEM DETAIL

Vickery, Ohio

APPENDIX E

FIGURES



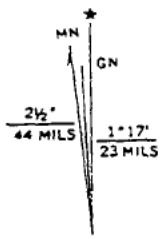
SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET
DATUM IS MEAN SEA LEVEL



UTM GRID AND 1969 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

CLYDE, OHIO
SW/4 BELLEVUE 15' QUADRANGLE
N4115—W8252.5/7.5

1969

QUADRANGLE LOCATION

RUST ENVIRONMENT & INFRASTRUCTURE

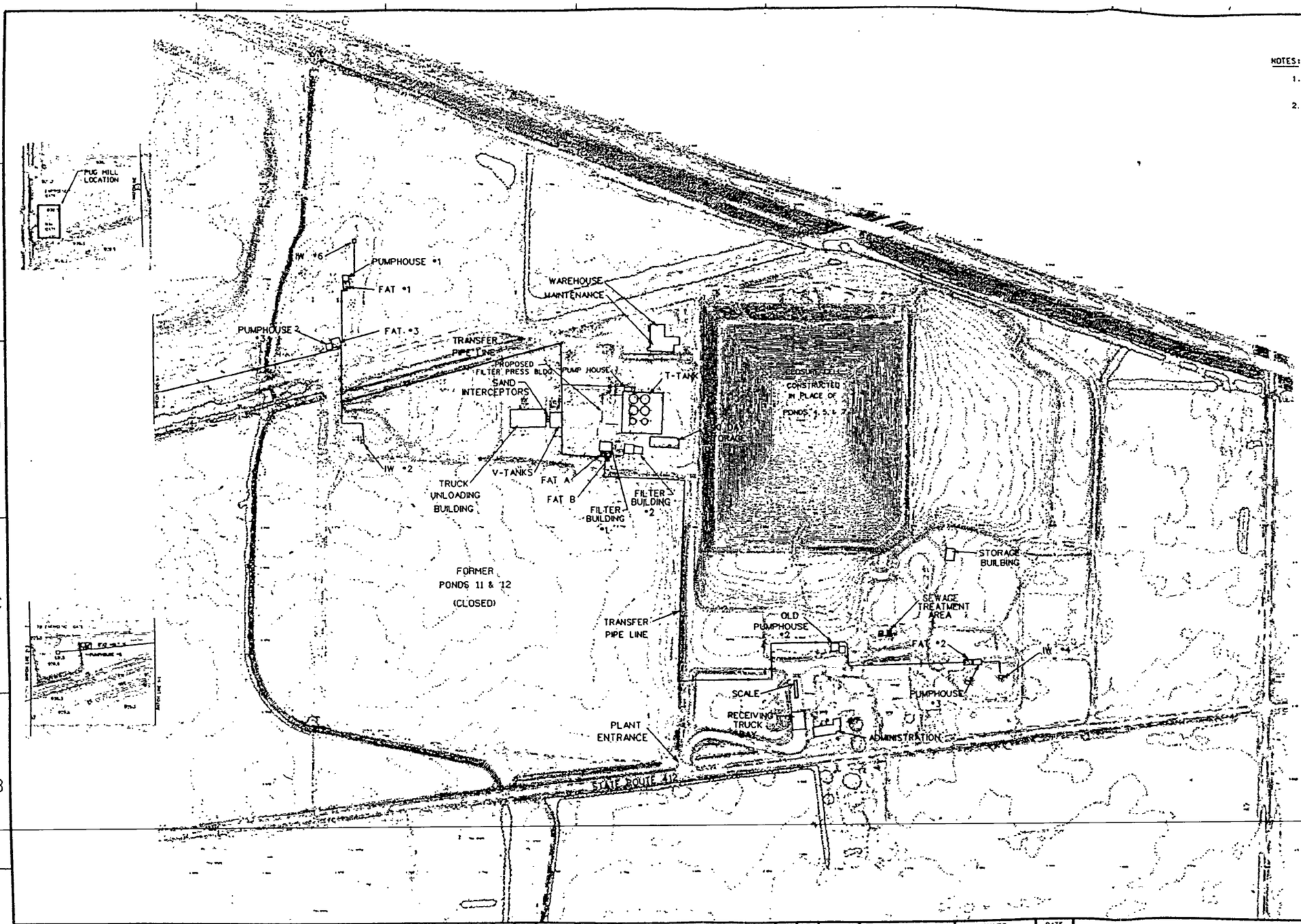
VICKERY
FIGURE 1
SITE LOCATION PLAN

NOTES:

1. TOPOGRAPHIC INFORMATION SUPPLIED BY AERO-METRIC ENGINEERING, INC. FLOWN 1/93.
2. TRANSFER PIPE LINE SHOWN AS GENERAL LOCATION ONLY.

899

4/15/99



NO	REVISIONS	MADE	CHK	DATE	NO	REVISIONS	MADE	CHK	DATE	NO	REVISIONS	MADE	CHK	DATE
										0	ISSUED FOR CLIENT REVIEW	JTP	RAL	7/02/93

NAMES		DATE
DRAWN:	J.T.P.	6/21/93
DESIGN:	R.A.L.	6/21/93
CHECKED:		
PE:		
APP'D:		
APP'D:		
APP'D:		

FIGURE 2
GENERAL SITE PLAN

VICKERY, OHIO

RUST ENVIRONMENT & INFRASTRUCTURE

PROJECT NUMBER 83797.000

DATE

SECD DWG NUMBER 83797P01

FILE NUMBER 83797

CLIENT DWG NUMBER FIGURE 2

SHEET NUMBER 1

CAD FILE NAME: 83797P01.DGN

PLOT DATE:

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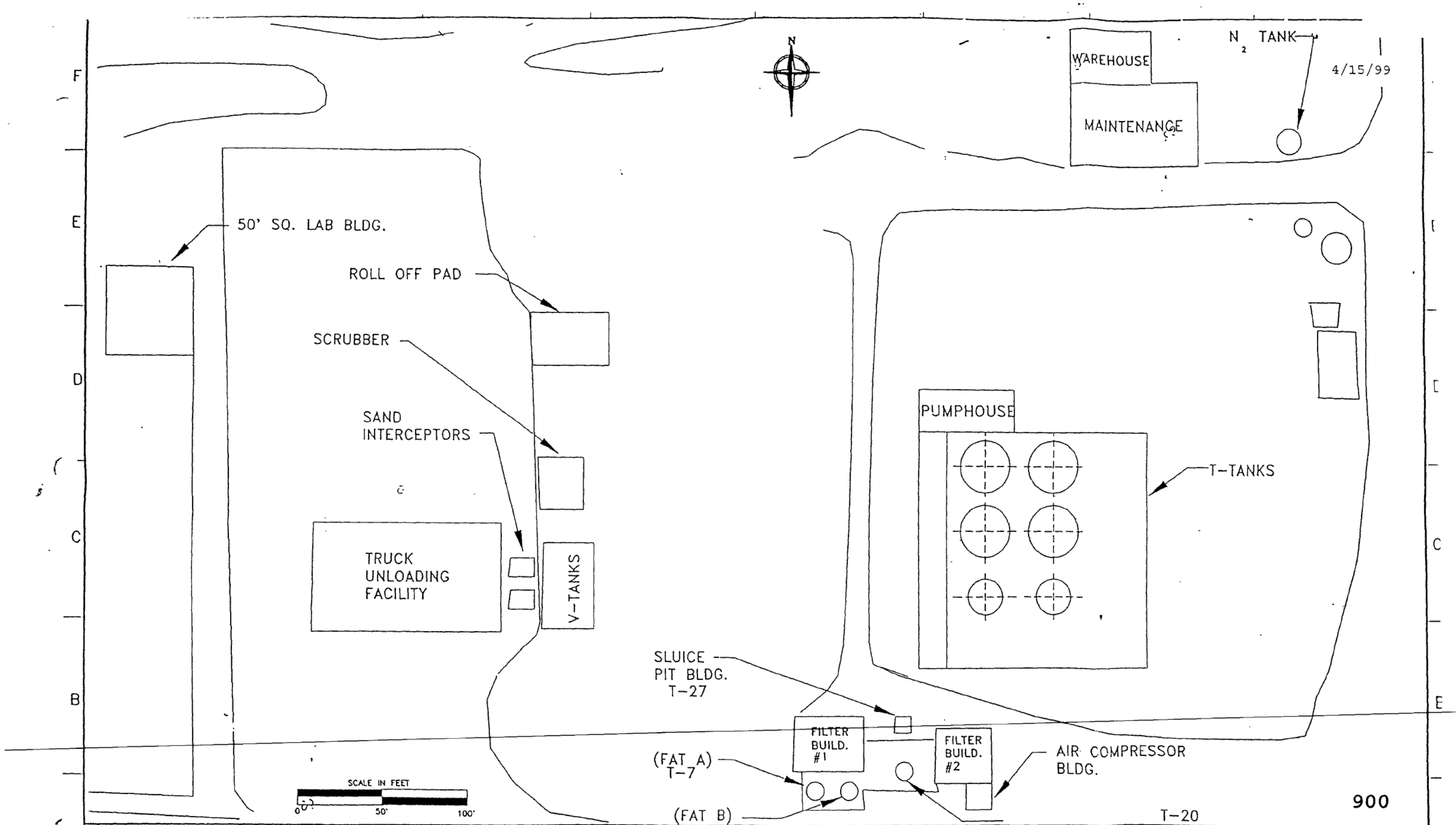


NO	REVISIONS	MADE	CHK	DATE	NO	REVISIONS	MADE	CHK	DATE	NO	REVISIONS	MADE	CHK	DATE

CWM Chemical Waste Management Inc. VICKERY, OHIO

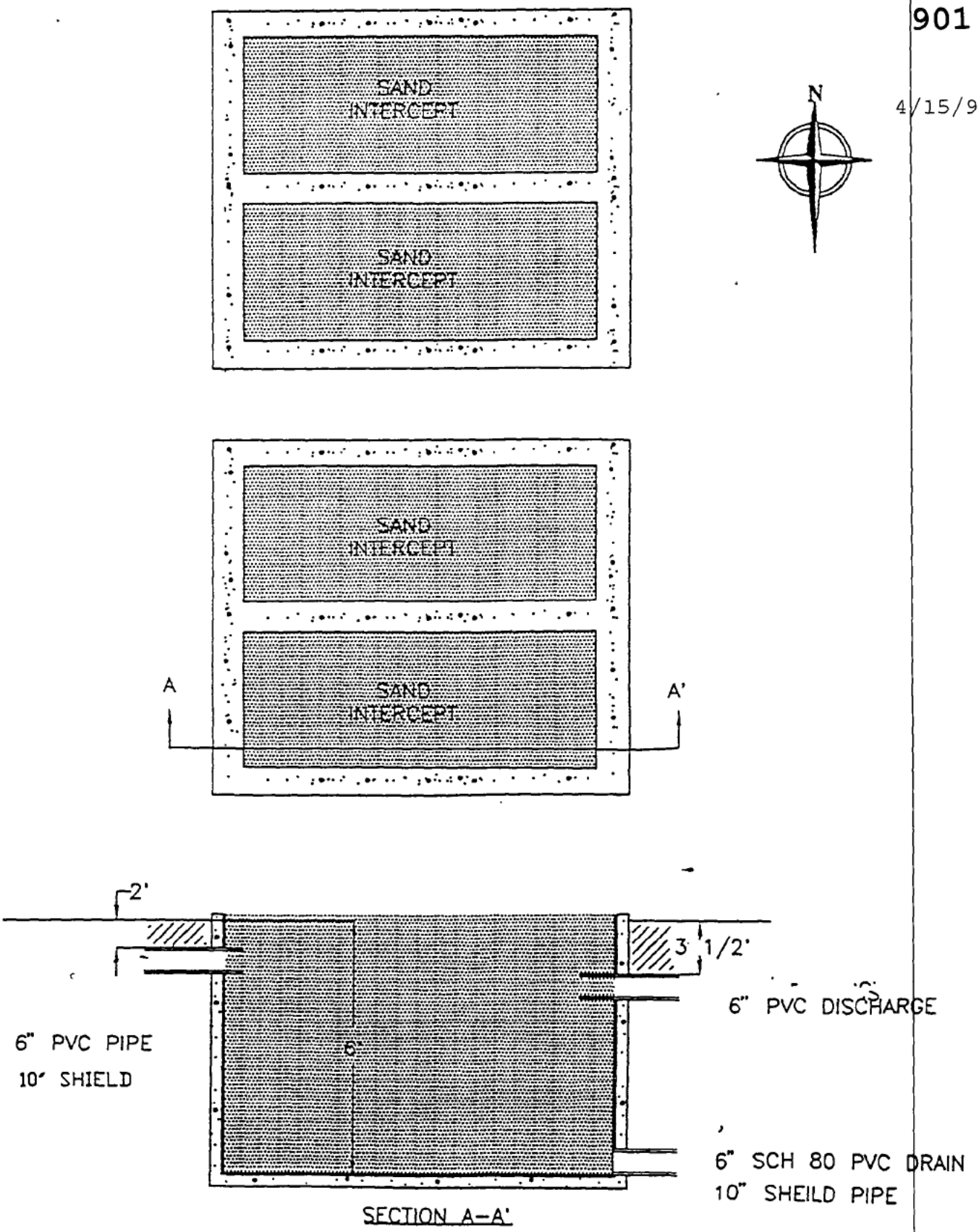
NAMES		DATE
DRAWN:	J.T.P.	6/17/93
DESIGN:	R.A.L.	6/17/93
CHECKED:		
PE:		
APP'D:		
APP'D:		
APP'D:		

FIGURE 3
WASTE TREATMENT OPERATIONS AREA

RUST ENVIRONMENT & INFRASTRUCTURE

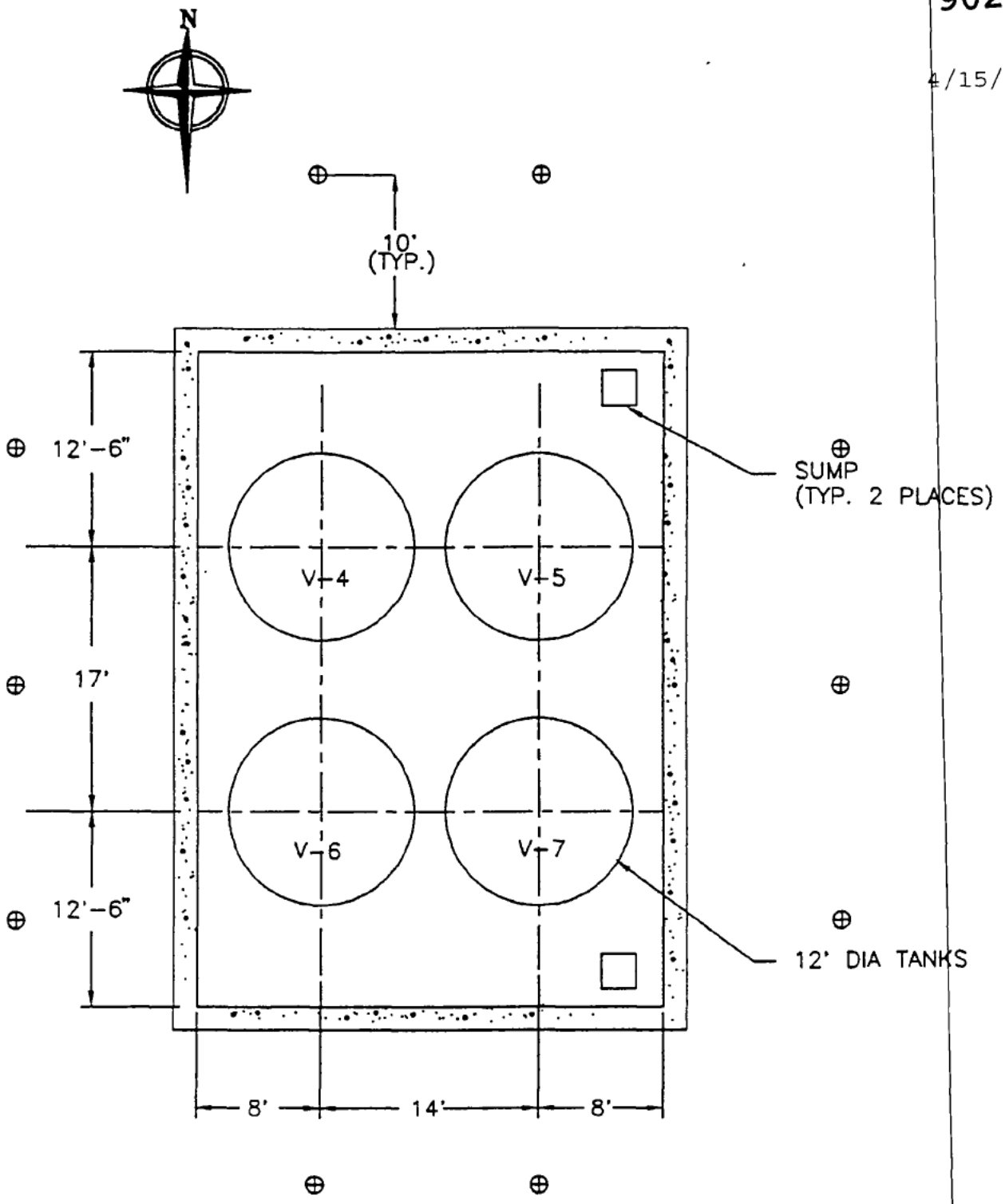
PROJECT NUMBER 83797.000 DATE
RUST DWG NUMBER 83797001 FILE NUMBER
CLIENT DWG

4/15/99



RUST ENVIRONMENT & INFRASTRUCTURE

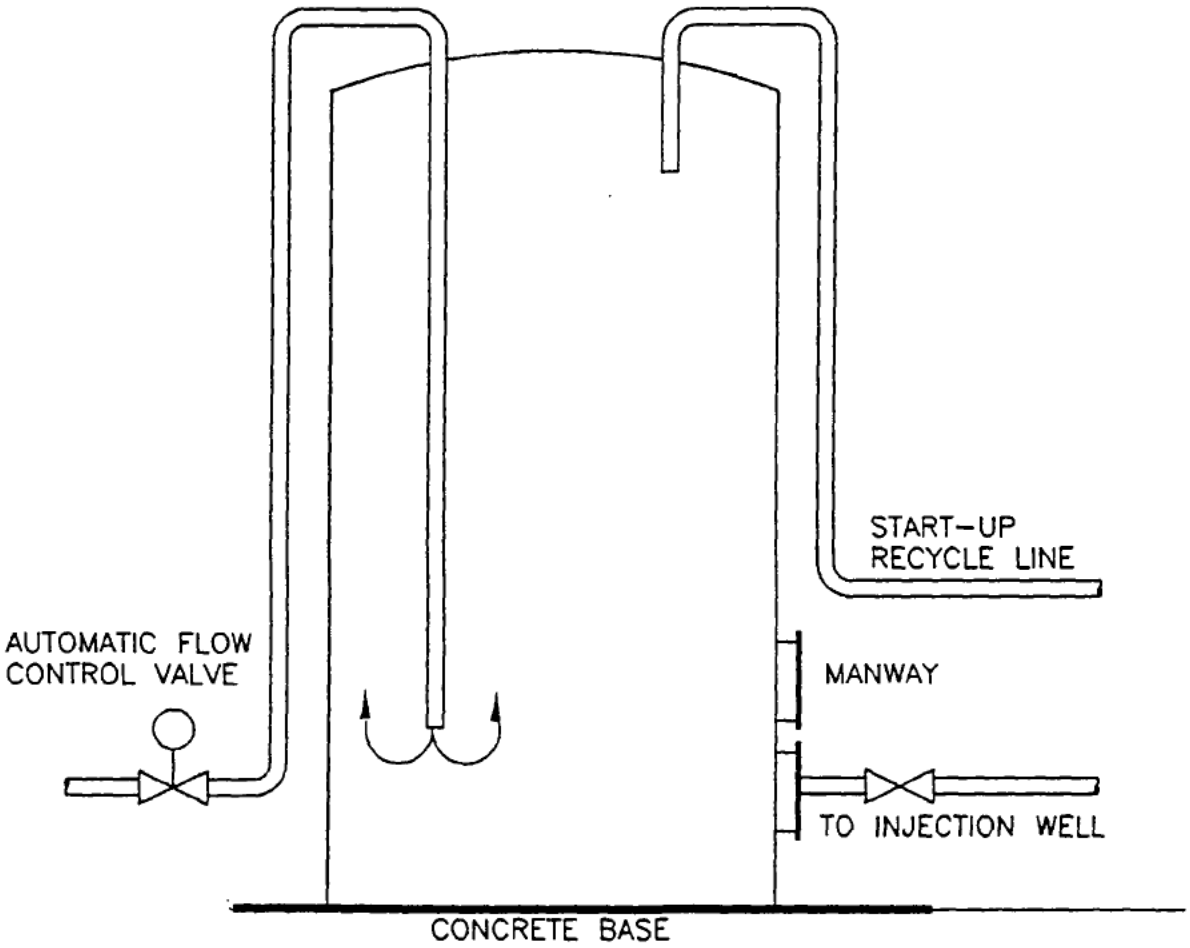
FIGURE 4
GRIT FILTERS
GENERAL ARRANGEMENT



RUST ENVIRONMENT & INFRASTRUCTURE

FIGURE 5
V-TANKS
GENERAL ARRANGEMENT &
SAMPLING LOCATION

4/15/99

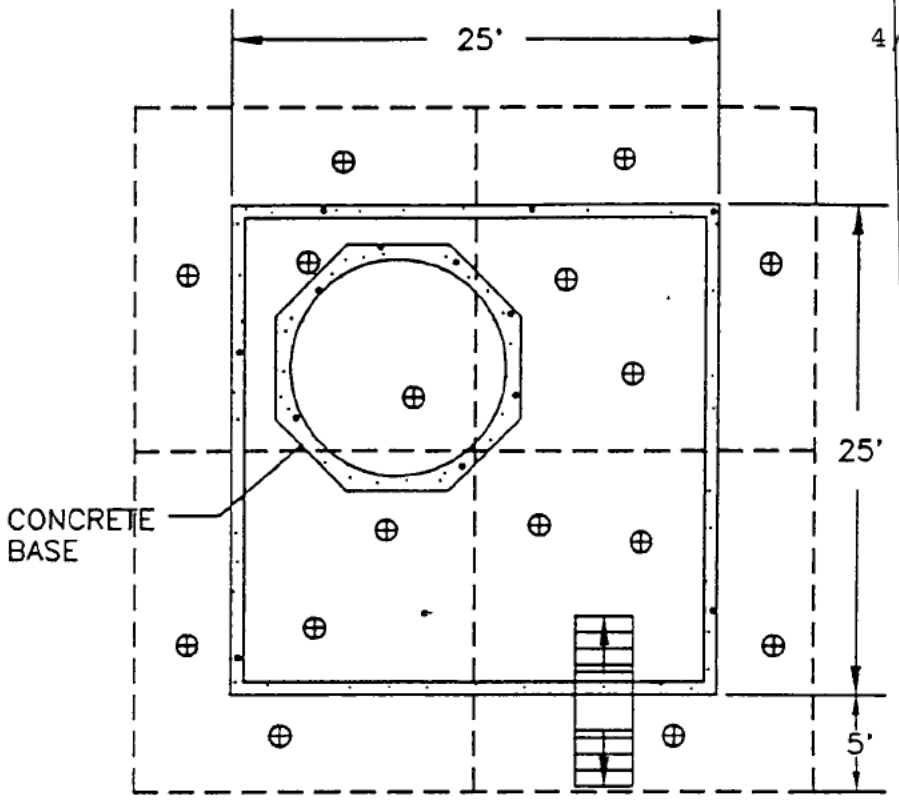


RUST ENVIRONMENT & INFRASTRUCTURE

FIGURE 6
FAT
GENERAL ARRANGEMENT

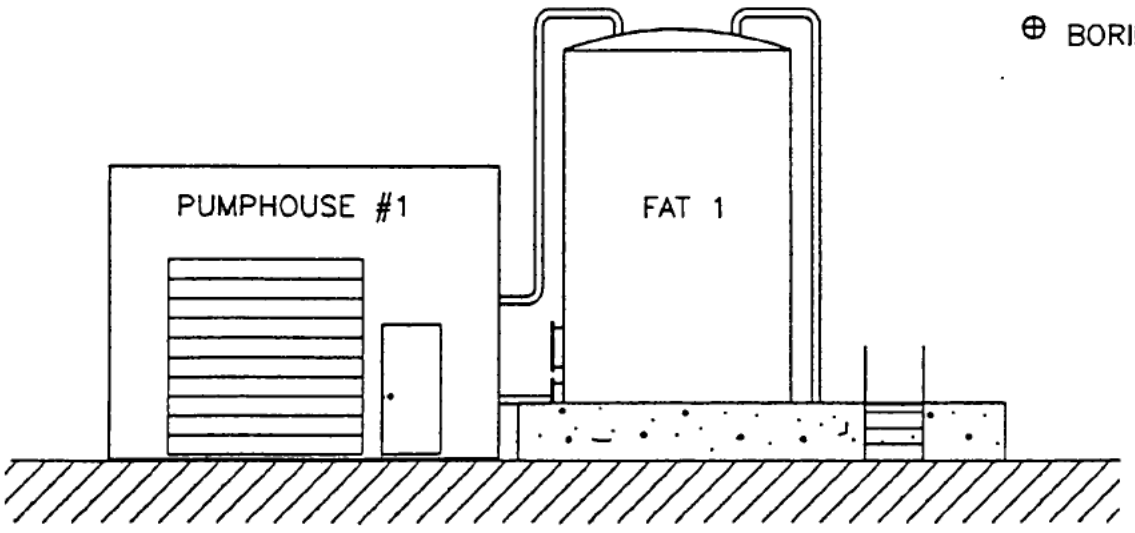
83797D03.DWG

4/15/99



PLAN VIEW

⊕ BORING LOCATION



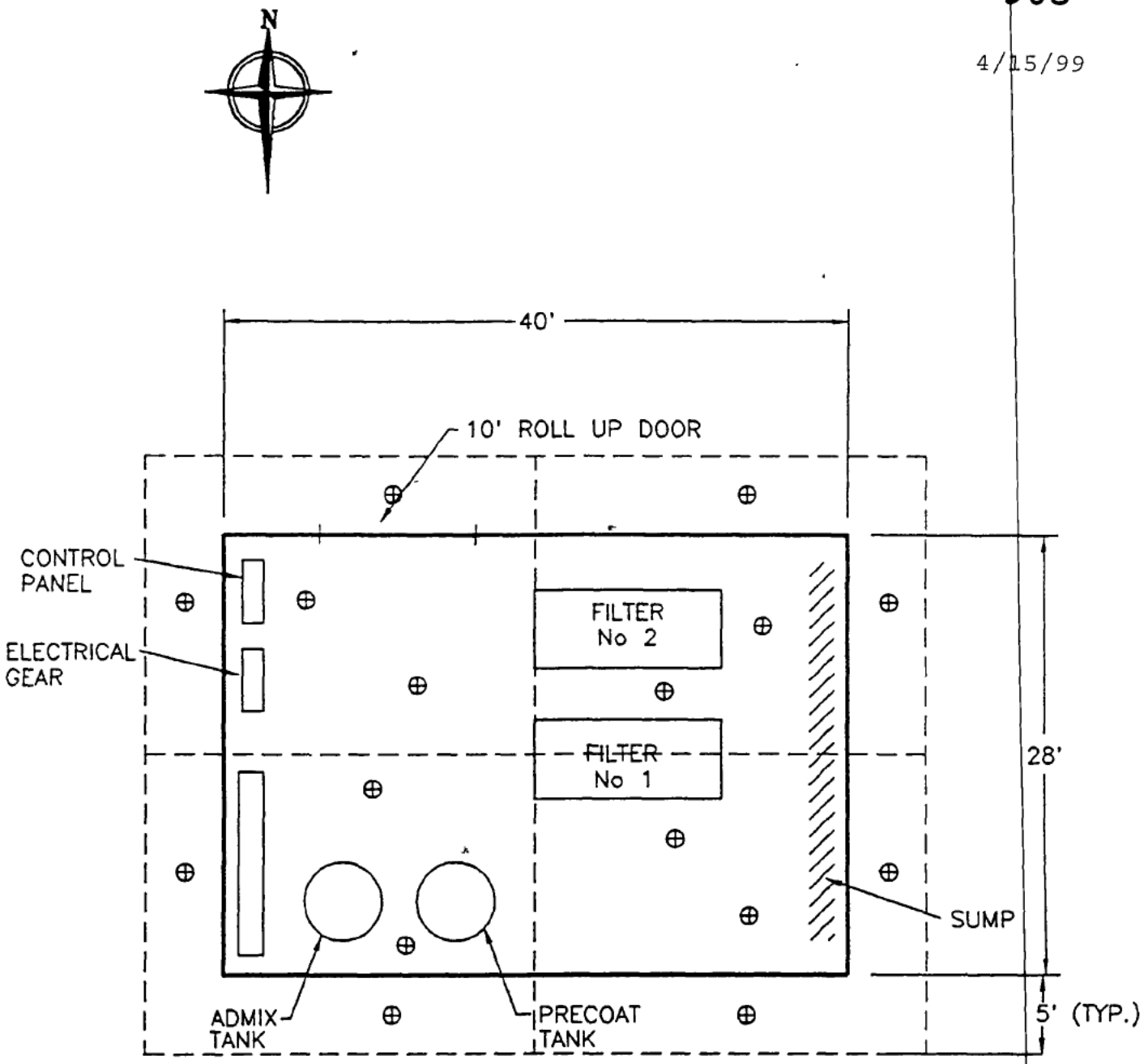
ELEVATION

RUST ENVIRONMENT & INFRASTRUCTURE

FIGURE 7
FAT
SAMPLING GRID
(TYPICAL)

'97D03.DWG

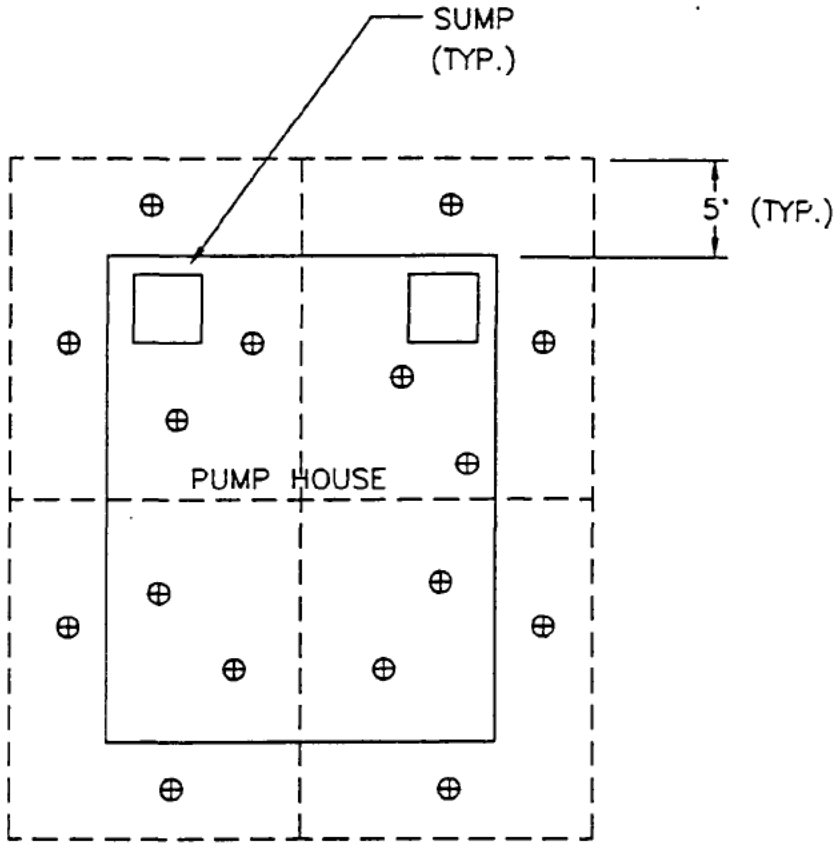
4/15/99



RUST ENVIRONMENT & INFRASTRUCTURE

FIGURE 8
FILTER BUILDING AREA
SAMPLE GRID

83797D03.DWG



⊕ SAMPLING LOCATION

N.T.S.

RUST ENVIRONMENT & INFRASTRUCTURE

FIGURE 9
PUMPHOUSE
GENERAL ARRANGEMENT

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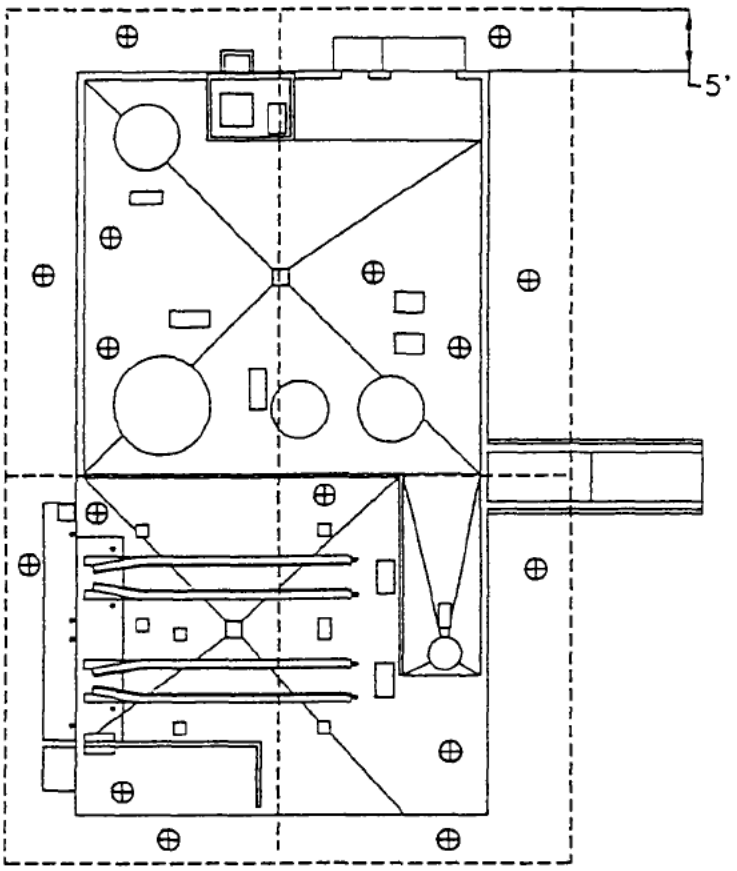


⊕ SAMPLING LOCATION

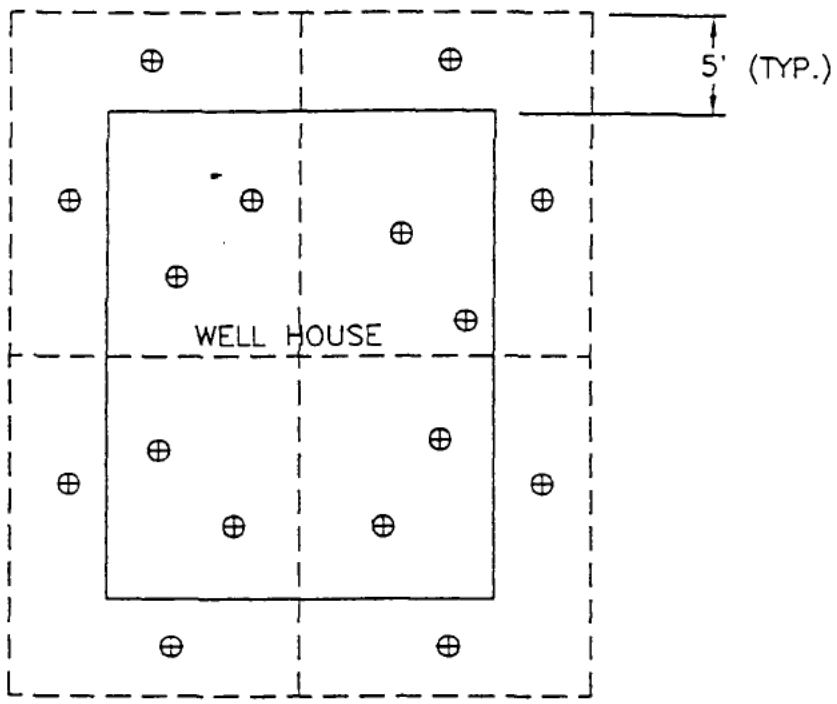
N.T.S.

RUST ENVIRONMENT & INFRASTRUCTURE

FIGURE 11
PROPOSED FILTER PRESS BLDG.
GENERAL ARRANGEMENT

908

4/15/99

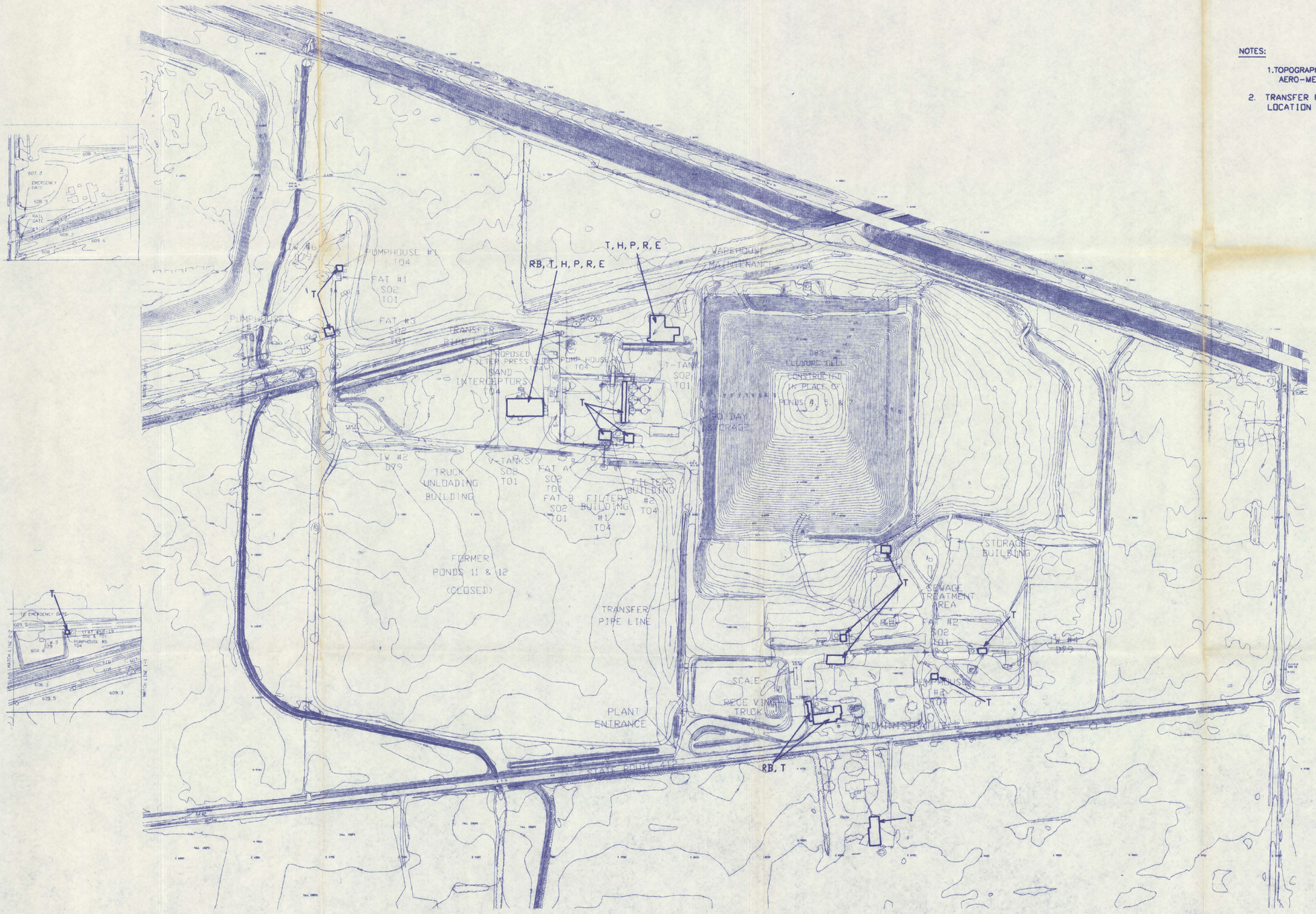


⊕ SAMPLING LOCATION

N.T.S.

RUST ENVIRONMENT & INFRASTRUCTURE

FIGURE 13
INJECTION WELL HOUSE
GENERAL ARRANGEMENT



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TELEPHONE	T
HEAVY EQUIPMENT	H
PERSONAL PROTECTION EQUIPMENT	P
RESPIRATION EQUIPMENT	R
EMERGENCY RESPONCE EQUIPMENT	E

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DRAWN E. MINELINE CHECK

No	DATE	BY	REVISION

98167S-4-1.dwg 1-29-99 105099 am EST

NORTH
ASSUMED

0 200
SCALE: 1" = 200'

FIG. 4-1 / 674

98167S

COMMUNICATION EQUIPMENT LOCATION

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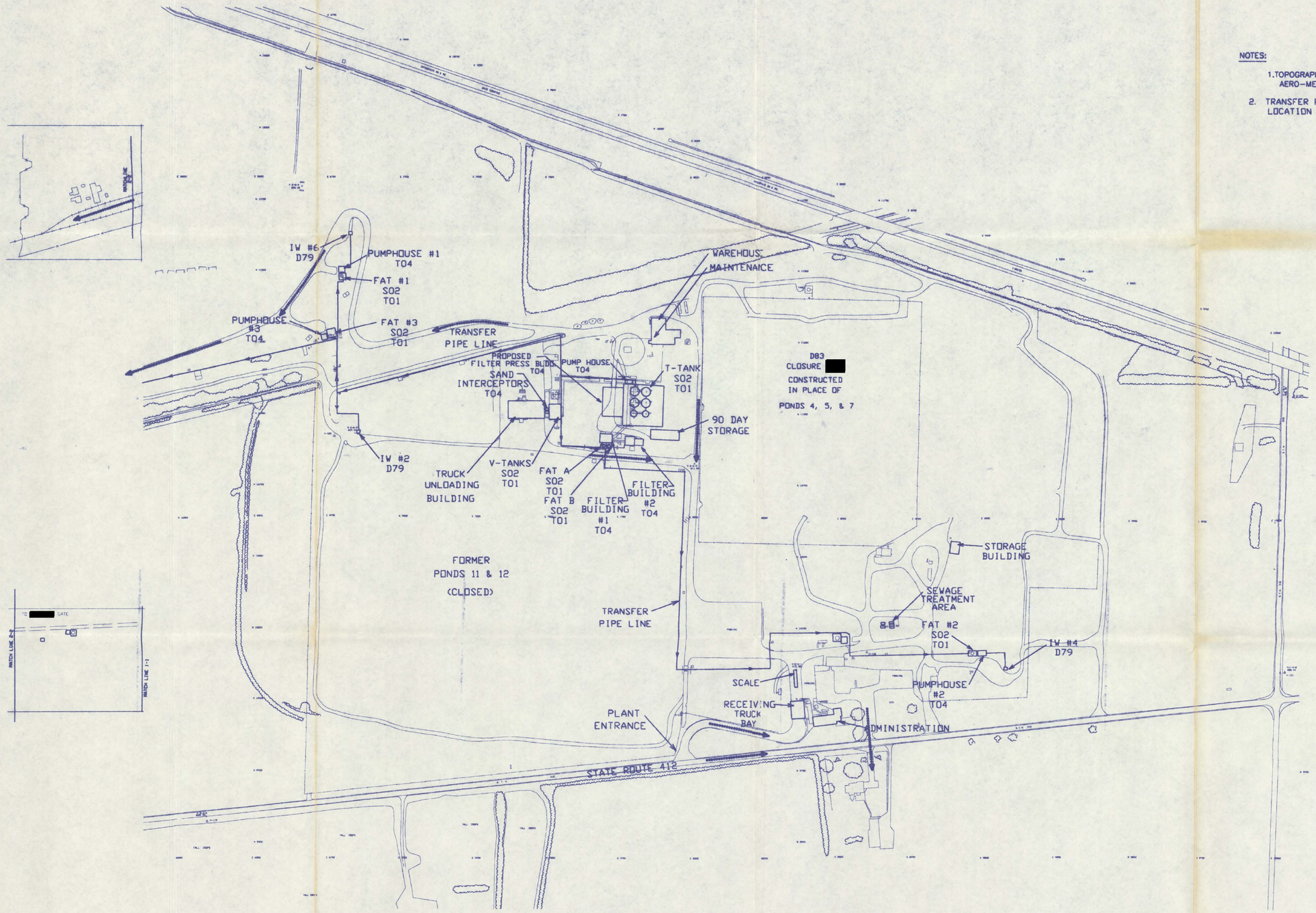

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No.	DATE	BY	REVISION	CHECK

DRAWN E. HAGLINE

1996/5-6-1.DWG 1-9-99 10:49:51 am EST

NORTH
ASSUMED

0 200
SCALE: 1" = 200'

FIG. 6-1 / 689

98167S

EVACUATION ROUTES