

**Municipal
Services**



**Engineering
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September 12, 1994

Mr. Edward F. Mussler
Environmental Engineer
Solid Waste Section
P.O. Box 27687
Raleigh, NC 27611-7687

Fac/Perm/Co ID #	Date	Doc ID#
96-01 mgj	7/19/2011	DIN 14417

Re: Permanent Methane Monitoring Plan - Wayne County Transition Plan, Permit No. 96-01. Response to August 16, 1994 letter.

Dear Mr. Mussler:

Enclosed you will find two (2) copies of a revised operation plan detailing a methane response plan, revised Appendix III with the GP-204 instruction manual detailing monitoring procedures including calibration, a revised methane monitoring plan to include the old landfill area, an explanation for the location of wells, and a detail for the construction and depth of permanent wells.

If you have any questions, please advise.

Very truly yours,
MUNICIPAL ENGINEERING SERVICES CO., PA

D. Wayne Sullivan

D. Wayne Sullivan
Project Manager

DWS:cd

Enclosures



State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Solid Waste Management

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
William L. Meyer, Director



September 14, 1994

Mr. Lloyd Cook
460 B. South Landfill Road
Dudley NC 28333

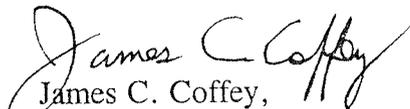
RE: Permanent Methane Monitoring Plan, Wayne County Landfill Transition Plan, Permit
No. 96-01

Dear Mr. Cook,

In accordance with 15A NCAC 13B .1626(4), owners or operators of all municipal solid waste landfill (MSWLF) units must implement a permanent methane monitoring program on or before October 9, 1994. The permanent methane monitoring plan in the referenced transition plan includes the frequency of testing, test procedure, and a response plan for situations in which methane gas levels are exceeded, in addition to, proposed probe location, depth, and construction. The Solid Waste Section hereby approves the proposed methane monitoring plan as outlined in the referenced transition plan, and Wayne County may begin construction of the proposed methane monitoring system.

If you have any questions regarding this matter, please contact Ed Mussler or Sherri Hoyt at (919)733-0692.

Sincerely,


James C. Coffey,
Supervisor, Solid Waste Section Permittting Branch

cc: Mr. D. Wayne Sullivan, Municipal Engineering
Terry Dover
Billy Morris
File

State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Solid Waste Management



James B. Hunt, Jr., Governor
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William L. Meyer, Director
August 16, 1994

Mr. D. Wayne Sullivan
Municipal Engineering Services, Co., PA
PO Box 97
Garner, NC 27529

RE: Permanent Methane Monitoring Plan, Wayne County Landfill Transition Plan,
Permit No. 96-01

Dear Mr. Sullivan,

In accordance with 15A NCAC 13B .1626(4), owners or operators of all municipal solid waste landfill (MSWLF) units must implement a permanent methane monitoring program on or before October 9, 1994. The permanent methane monitoring plan in the referenced transition plan should include the frequency of testing, test procedure, and a response plan for situations in which methane gas levels are exceeded, in addition to, proposed probe or well location, depth, and construction.

The methane monitoring plan should describe the permanent monitoring system including a rationale as to why the particular spacing was chosen and the anticipated depth of the proposed wells. The factors of Rule .1626(4)(b)(i) should be addressed in the design of the permanent methane monitoring system. Other factors to consider are the depth to groundwater and the type of soils in and around the landfill.

The methane monitoring plan should include an emergency response plan, to be implemented in the event that gas is detected, particularly in or around buildings. The plan should address the steps to be taken to ensure protection of human health (see Rule .1626(4)(c)(i). In addition the sampling protocol should be expanded, instruments identified, and sampling locations in and around structures on-site identified. A comprehensive monitoring sampling and analysis plan, similar to groundwater procedures, is recommended since the County plans to have one of its employees do the monitoring.

What steps are being taken to monitor the existing, inactive landfill area, to ensure that the gas compliance limits are being met from these areas ? Does a monitoring plan and or system exist for this closed area?

Please submit this information to the Solid Waste Section within 30 days from the issuance date of this letter to avoid compliance action by the Section. If you have any questions regarding this matter, please contact me or Sherri Hoyt at (919)733-0692.

Sincerely,


Edward F. Mussler
Environmental Engineer
Solid Waste Section

cc: Bill Morris
Terry Dover File

OPERATIONAL PLAN FOR WAYNE COUNTY

The County of Wayne will operate their existing landfill until the end of 1997. The Transition Plan includes a vertical expansion which will be the plan by which the landfill is filled. The County has been operating under the trench method and now will have to fill with the area type fill. The daily fill should be maintained in the smallest area possible and filled as deep as possible before the daily cover is applied.

Daily cover will be the combination of soil and synthetic cover. The synthetic cover will be used on days that the next days fill will be placed directly on top of the fill. Soil cover will be used when the next days waste will not be placed directly on top and the synthetic cover is not large enough to cover the entire area. (See cover requirements under operational requirements).

The County will implement a program at the landfill for detecting and preventing the disposal of hazardous and liquid wastes. The program shall consist of random inspection of incoming loads at a minimum of 1% of the weekly traffic. Landfill personnel will be trained to recognize hazardous and liquid wastes. Records shall be kept on the training and the inspections. (See Appendix I).

The County of Wayne shall monitor for explosive gases of landfill structures and property boundaries. The concentration of methane gases generated by the landfill cannot exceed 25 percent of the lower explosive limit for methane in the structures, and it cannot exceed the lower explosive limit for methane of the landfill property boundary. (See Appendix III) If methane gas is found to exceed the acceptable limits at either the property boundary or landfill structures, it is the County's responsibility to do the following:

1. Immediately take all necessary steps to ensure protection of human health, i.e. no smoking, temporarily abandon the structure and notify the Division of Solid Waste Management.
2. Within seven days of detection, place in the operating record the methane gas levels detected and a description of the steps taken to protect human health; and
3. Within 60 days of detection, implement a remediation plan for the methane gas releases, place a copy of the plan in the operating record, and notify the Division of Solid Waste Management that the plan has been implemented. The plan shall describe the nature and extent of the problem and the proposed remedy.

Off and on site erosion shall be controlled through erosion control structures and devices. Provisions for a vegetative ground cover sufficient to restrain erosion shall be accomplished within 30 working days or 120 calendar days upon completion of any phase of landfill development.

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The County of Wayne will record and retain at the landfill an operating record of the following information:

- (1) Inspection records, waste determination records, and training procedures;
- (2) Amounts by weight of solid waste received at the landfill to include source of generation.
- (3) Gas monitoring results and any remediation plans;
- (4) Any demonstration, certification, findings, monitoring, testing or analytical data required for surface and groundwater monitoring;
- (5) Any monitoring, testing or analytical data required for closure or post-closure; and,
- (6) Any cost estimates and financial assurance documentation.

All information contained in the operating record will be furnished upon request to the Division of Solid Waste Management or be made available at all reasonable times for inspection by the Division.

Ground and surface water shall be sampled and analyzed according to Subtitle D Appendix I detection monitoring requirements. The monitoring frequency for all Appendix I detection monitoring constituents shall be at least semiannual during the life of the facility (including closure) and the post-closure period. A minimum of four independent samples from each well (background and downgradient) shall be collected and analyzed for the Appendix I constituents during the first semiannual sampling event. At least one sample from each well (background and downgradient) shall be collected and analyzed during subsequent semiannual sampling events.

If the County of Wayne determines that there is a statistically significant increase over background for one or more of the constituents listed in Appendix I at any monitoring well at the relevant point of compliance, the County shall, within 14 days of the finding, report to the Division of Solid Waste and place a notice in the operating record indicating which constituents have shown statistically significant changes from background levels. The County shall establish an assessment monitoring program within 90 days. The County may demonstrate that a source other than the landfill caused the contamination or that the statistically significant increase resulted from an error in sampling, analysis, statistical evaluation, or natural variation in ground-water quality. A report documenting these demonstrations shall be certified by a Licensed Geologist or Professional Engineer and approved by the Division of Solid Waste. A copy of this report shall be placed in the operating record. If a successful demonstration is made, documented, and approved by the Division, the County may continue detection monitoring. If after 90 days, a successful demonstration is not made, the County shall initiate an assessment monitoring program.

OPERATIONAL REQUIREMENTS

- I. Waste Acceptance and Disposal Requirements
 - a. The Municipal Solid Waste Landfill (MSWLF) will only accept those solid wastes which it is permitted to receive. Wayne County will notify the Division within 24 hours of attempted disposal of any waste the landfill is not permitted to receive, including waste from outside the Wayne County area the landfill is permitted to serve.
 - b. The following wastes are prohibited from disposal at the MSWLF:
 - i. Hazardous waste as defined within 15A NCAC 13A, to also include hazardous waste from conditionally exempt small quantity generators.
 - ii. Polychlorinated biphenyls (PCB) wastes as defined in 40 CFR 761.
 - iii. Liquid wastes unless the container is a small container similar in size to that normally found in household waste; the container is designed to hold liquids for use other than storage; or the waste is household waste.
 - c. Spoiled foods, animal carcasses, abattoir waste, hatchery waste, and other animal waste delivered to the disposal site shall be covered immediately.
 - d. Asbestos waste shall be managed in accordance with 40 CFR 61. The waste shall be covered immediately with soil in a manner that will not cause airborne conditions and must be disposed of separate and apart from other solid wastes:
 - i. At the bottom of the working face or;
 - ii. In an area not contiguous with other disposal areas. Separate areas shall be clearly designated so that asbestos is not exposed by future land disturbing activities.
 - e. Wastewater treatment sludges may be accepted either as a soil conditioner or co-disposed in the permitted area.
 - f. Wayne County will implement a program at the Landfill for detecting and preventing the disposal of hazardous and liquid wastes. (Appendix I) This program will include, at a minimum:

- i. Random inspections of incoming loads or other comparable procedures;
- ii. Records of any inspections;
- iii. Training of facility personnel to recognize hazardous and liquid wastes.
- iv. Development of a contingency plan to properly manage any identified hazardous and liquid wastes. The plan must address identification, removal, storage and final deposition of the waste.

2. Cover material requirements

- a. Except as in Part (b), Wayne County must cover disposed solid waste with six inches of earthen material at the end of each operating day, or at more frequent intervals if necessary, to control disease vectors, fires, odors blowing litter, and scavenging.
- b. Alternative materials such as synthetic cover may be used as daily cover on the working face or until it is necessary to cover with earthen material. The alternative material must be applied according to manufacturers recommendations. (Appendix II)
- c. Areas which will not have additional wastes placed on them for 12 months or more, but where final termination of disposal operations has not occurred, shall be covered with a minimum of one foot of intermediate cover.

3. Disease vector control

- a. Wayne County will prevent or control on-site populations of disease vectors using techniques appropriate for protection of human health and the environment.
- b. "Disease vectors" means any rodents, flies, mosquitoes, or other animals, including insects, capable of transmitting disease to humans.

4. Explosive gases control

- a. Wayne County must ensure that:
 - i. The concentration of methane gas generated by the landfill does not exceed 25 percent of the lower explosive limit for methane in

landfill structures (excluding gas control or recovery system components); and

- ii. The concentration of methane gas does not exceed the lower explosive limit for methane at the landfill property boundary.
- b. Wayne County will implement a routine methane monitoring program to ensure that the standards of 4 (a) are met. (Appendix III)
 - i. The type and frequency of monitoring must be determined based on the following factors:
 - I. Soil conditions;
 - II. The hydrogeologic conditions surrounding the facility;
 - III. The hydraulic conditions surrounding the facility;
 - IV. The location of facility structures and property boundaries.
 - ii. The minimum frequency of monitoring shall be quarterly.
- c. If methane gas levels exceeding the limits specified in 4 (a) are detected, the owner or operator will:
 - i. Immediately take all necessary steps to ensure protection of human health, i.e. no smoking, temporarily abandon the structure and notify the Division of Solid Waste Management.
 - ii. Within seven days of detection, place in the operating record the methane gas levels detected and a description of the steps taken to protect human health; and
 - iii. Within 60 days of detection, implement a remediation plan for the methane gas releases, place a copy of the plan in the operating record, and notify the Division of Solid Waste Management that the plan has been implemented. The plan shall describe the nature and extent of the problem and the proposed remedy.
- d. "Lower explosive limit" means the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at 25° C and atmospheric pressure.

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5. Air Criteria

- a. Wayne County will ensure that the landfill does not violate any applicable requirements developed under a State Implementation Plan (SIP) approved or promulgated by the US. EPA Administrator pursuant to Section 110 of the Clean Air Act, as amended.
- b. Open burning of solid waste, except for the infrequent burning of land clearing debris generated on site or debris from emergency clean-up operations, is prohibited. Any such infrequent burning will be approved by the Division of Solid Waste Management.
- c. Equipment will be provided to control accidental fires or arrangements will be made with the local fire protection agency to immediately provide fire-fighting services when needed.
- d. Fires that occur at the landfill will be reported to the Division of Solid Waste Management within 24 hours and written notification will be submitted within 15 days.

6. Access and safety requirements

- a. The landfill will be adequately secured by means of gates, chains, beams, fences and other security measures approved by the Division of Solid Waste Management to prevent unauthorized entry.
- b. An attendant will be on duty at the site at all times while it is open for public use to ensure compliance with operational requirements.
- c. The access road to the site will be of all-weather construction and maintained in good condition.
- d. Dust control measures will be implemented when necessary.
- e. Signs providing information on tipping or disposal procedures, the hours during which the site is open for public use, the permit number and other pertinent information will be posted at the site entrance.
- f. Signs will be posted stating that no hazardous or liquid waste can be received.
- g. Traffic signs or markers will be provided as necessary to promote an orderly traffic pattern to and from the discharge area and to maintain efficient operating conditions.

- h. The removal of solid waste from the landfill will be prohibited unless the County approves and the removal is not performed on the working face.
- i. Barrels and drums will not be disposed of unless they are empty and perforated sufficiently to ensure that no liquid or hazardous waste is contained therein, except fiber drums containing asbestos.

7. Erosion and Sedimentation Control Requirements

- a. Adequate sediment control measures (structures or devices), will be utilized to prevent silt from leaving the landfill.
- b. Adequate sediment control measures (structures or devices), will be utilized to prevent excessive on-site erosion.
- c. Provisions for a vegetative ground cover sufficient to restrain erosion will be accomplished within **30 working days** or **120 calendar days** upon completion of any phase of landfill development.

8. Drainage Control and Water Protection Requirements

- a. Surface water will be diverted from the operational area.
- b. Surface water will not be impounded over or in waste.
- c. Solid waste will not be disposed of in water.
- d. Leachate will be contained on site and properly treated prior to discharge.
- e. The landfill will not:
 - (i) Cause a discharge of pollutants into waters of the United States, including wetlands, that violates any requirements of the Clean Water Act, including, but not limited to, the National Pollutant Discharge Elimination System (NPDES) requirements pursuant to Section 402.
 - (ii) Cause the discharge of a nonpoint source of pollution to waters of the United States, including wetlands, that violates any requirements of an area-wide or state-wide water quality management plan that has been approved under Section 208 or 319 of the Clean Water Act, as amended.

9. Liquids Restriction

- a. Bulk or non-containerized liquid waste will not be placed in the landfill unless:
 - (i) The waste is household waste other than septic waste and waste oil,
- b. Containers holding liquid wastes will not be placed in the landfill unless:
 - (i) The container is a small container similar in size to that normally found in household waste;
 - (ii) The container is designed to hold liquids for use other than storage; or
 - (iii) The waste is household waste.
- c. For the purpose of this paragraph:
 - (i) Liquid waste means any waste material that is determined to contain "free liquids" as defined by Method 9095 (Paint Filter Liquids Test), S. W. 846.

10. Recordkeeping Requirements

- a. Wayne County MSWLF will record and retain at the facility, or an alternative location near the facility approved by the Division of Solid Waste Management, in an operating record the following information as it becomes available.
 - (i) Inspection records, waste determination records, and training procedures;
 - (ii) Amounts by weight of solid waste received at the landfill to include source of generation.
 - (iii) Gas monitoring results and any remediation plans;
 - (iv) Any demonstration, certification, findings, monitoring, testing or analytical data required for surface and groundwater monitoring;
 - (v) Any monitoring, testing or analytical data required for closure or post-closure; and,
 - (vi) Any cost estimates and financial assurance documentation.

b. All information contained in the operating record will be furnished upon request to the Division of Solid Waste Management or be made available at all reasonable times for inspection by the Division.

c. Wayne County will maintain a copy of the operation plan at the landfill.

11. Spreading and Compacting Requirements

a. The landfill will restrict solid waste into the smallest area feasible.

b. Solid waste will be compacted as densely as practical into cells.

c. Appropriate methods such as fencing and diking will be provided within the area to confine solid waste subject to be blown by the wind. At the conclusion of each day of operation, all windblown material resulting from the operation will be collected and returned to the area.

APPENDIX I

A. INTRODUCTION

The municipal solid waste stream is made up of wastes from all sectors of society. The waste is often categorized by its source or its characteristics. Terms used include commercial, industrial, residential, biomedical, hazardous, household, solid, liquid, demolition/construction, sludge, etc. Regardless of how one classifies wastes, the bottom line is that wastes are delivered to the landfill and a management decision must be made to either reject or accept them. This responsibility rests with the manager of the landfill. Wastes which are not authorized to be accepted at the landfill create a number of potential problems including: (1) liability due to future releases of contaminants; (2) bad publicity if media learns of unacceptable waste entering the landfill; (3) potential for worker injury; (4) exposure to civil or criminal penalties; (5) damage to landfill environmental control systems.

B. HAZARDOUS WASTE REGULATIONS AND MANAGEMENT

In the United States, hazardous waste is regulated under RCRA, Subtitle C. A waste is hazardous if it is listed as a hazardous waste by the Administrator of the Environmental Protection Agency (EPA) in the Code of Federal Regulations, Title 40, Part 261, or if it meets one or more of the hazardous waste criteria as defined by EPA. These criteria are:

- Ignitability
- Corrosivity
- Reactivity
- Toxicity

1. Ignitability

Ignitable waste is a waste that burns readily, causes a fire by friction under normal circumstances, or is an oxidizer. Any waste having a flash point of <140F falls in this category. Flash point is that temperature at which a liquid gives off vapors that will ignite when an open flame is applied. Under Department of Transportation (DOT) definitions, a flammable liquid has a flash point of >100 F. A combustible liquid has a flash point between 100 and 200 F. Therefore, a flammable liquid is always hazardous while a combustible liquid may or may not be hazardous depending upon its flash point.

2. Corrosivity

A corrosive waste is one having a very high or a very low pH. The pH of a liquid is a measure of how acidic or basic (alkaline) the material is. The pH scale ranges from 0 to 14. High numbers are basic and low numbers are acidic. A substance having a pH ≤ 2.0 or ≥ 12.5 is defined as hazardous under RCRA.

3. Reactivity

A waste is reactive if it is normally unstable; reacts violently with water; forms an explosive mixture with water; contains quantities of cyanide or sulfur that could be released to the air; or can easily be detonated or exploded. These wastes may fall into any one of several DOT categories.

4. Toxicity Characteristic Leaching Procedure (TCLP)

A waste is TCLP toxic if the concentration of any constituent in Table 1 exceeds the standard assigned to that substance. The TCLP is a methodology which attempts to simulate the conditions within a landfill. An acidic solution is passed through a sample of waste and the resultant "leachate" is analyzed for contaminants. The TCLP is designed to detect heavy metals, pesticides and a few other organic and inorganic compounds. The purpose of the test is to prevent groundwater contamination by highly toxic materials. TCLP tests the mobility of 40 different elements and compounds.

Except in certain specified circumstances, regulated quantities of hazardous waste must be disposed of at a permitted hazardous waste disposal facility. In accordance with 40 CFR Part 261.3, **any material contaminated by a hazardous waste is also deemed to be a hazardous waste and must be managed as such.** RCRA permits are also required to store, transport, and treat hazardous waste.

C. POLYCHLORINATED BIPHENYL'S (PCBs)

1. Introduction

PCBs are nonflammable and conduct heat without conducting electricity. These compounds were most frequently used as an additive to oil or other liquids in situations where heat was involved. The PCBs enhance the heat conducting properties of the liquid and thereby increase the heat dissipation or cooling effect obtained. They have also been used in lubricants and paint. In the United States one of the most common applications was in electric transformers. The only effective method for destroying PCBs is high Temperature incineration which is relatively expensive due to a shortage of PCB incineration capacity.

By law PCB's are no longer used as dielectrics in transformers and capacitors manufactured after 1979. There are many millions of pounds of PCBs still in use or in storage. One example is the ballasts used in fluorescent light fixtures. It has been estimated that there are between 0.5 million and 1.5 billion ballasts currently in use in this country. Due to the long life of these units, about half of these may be of pre-1979 manufacture and contain PCBs. Since each ballast contains about one ounce of nearly pure PCB fluid, there are about **20 to 30 million pounds** of PCBs in existing lighting fixtures. These items are not the subject to RCRA Subtitle D Waste Screening!

Commercial or industrial sources of PCB wastes that should be addressed by the program include:

- Mineral oil and dielectric fluids containing PCBs;
- Contaminated soil, dredged material, sewage sludge, rags, and other debris from a release of PCBs;
- Transformers and other electrical equipment containing dielectric fluids; and
- Hydraulic machines.

2. PCB Regulatory Requirements

As contrasted to hazardous wastes, RCRA regulates PCBs based on the concentration of PCBs in the waste rather than the source or characteristic of the waste. The regulations concerning PCB disposal are spelled out in 40 CFR Part 761. Subtitle D of RCRA merely requires that PCB waste not be disposed in a MSW landfill. PCB management requirements include:

Waste containing more than 500 ppm of PCBs must be incinerated. Waste containing from 50 to 500 ppm must be disposed of by incineration, approved burning, or in chemical waste landfill permitted to receive such wastes. The regulations are silent concerning wastes containing less than 50 ppm of PCBs; however, the regulations cannot be circumvented by diluting stronger wastes.

D. FUNDAMENTALS OF WASTE SCREENING

1. Know Your Generators and Haulers

Since the level of sophistication of your waste screening program will be a reflection of the likelihood of hazardous waste and PCB waste being in your incoming waste, knowledge of the commercial industrial base of your service area is critical. Some examples are the automotive industry, which generates solvents, paint wastes, lead acid batteries, grease and oil; the dry cleaning industry,

which may generate filters containing dry cleaning solvents; metal platers which generate heavy metal wastes; and other industries which generate a variety of undesirable wastes; e.g. chemical and related products, petroleum refining, primary metals, electrical and electronic machinery, etc.

Landfill managers should also know the haulers and trucks serving the businesses in their community which are likely to carry unacceptable wastes.

Some local governments and solid waste management agencies have enacted legislation requiring haulers to provide a manifest showing the customers whose wastes make up that particular load. Such a manifest is an extremely useful tool when a load is found to contain prohibited wastes. It is unwise to accept wastes from unknown, unlicensed, or otherwise questionable haulers.

2. Inspections

An inspection is typically a visual observation of the incoming waste loads by an individual who is trained to identify regulated hazardous or PCB wastes that would not be acceptable for disposal at the MSWLF unit. An inspection is considered satisfactory if the inspector knows the nature of all materials received in the load and is able to discern whether the materials are potentially regulated hazardous wastes or PCB wastes.

Ideally, all loads should be screened; however, it is generally not practical to inspect in detail all incoming loads. Random inspections, therefore, can be used to provide a reasonable means to adequately control the receipt of inappropriate wastes. Random inspections are simply inspections made on less than every load.

The frequency of random inspections may be based on the type and quantity of wastes received daily, and the accuracy and confidence desired in conclusions drawn from inspection observations. Because statistical parameters are not provided in the regulation, a reasoned, knowledge-based approach may be taken. A random inspection program may take many forms such as inspecting every incoming load one day out of every month or inspecting one or more loads from transporters of wastes of unidentifiable nature each day. If these inspections indicate that unauthorized wastes are being brought to the MSWLF site, the random inspection program should be modified to increase the frequency of inspections.

Inspection frequency also can vary depending on the nature of the waste. For example, wastes received predominantly from commercial or industrial sources may require more frequent inspections than wastes predominantly from households.

Inspection priority also can be given to haulers with unknown service areas, to loads brought to the facility in vehicles not typically used for disposal of municipal solid waste, and to loads transported by previous would-be offenders. For wastes of unidentifiable nature received from sources other than households (e.g., industrial or commercial establishments), the inspector should question the transporter about the source/composition of the materials.

Loads should be inspected prior to actual disposal of the waste at the working face of the landfill unit to provide the County the opportunity to refuse or accept the wastes. Inspections can be conducted on a tipping floor located near the facility scale house, inside the site entrance, or near, or adjacent to, the working face of the landfill unit. (Figure 1)

An inspection flow chart to identify, accept, or refuse solid waste is provided as Figure 2.

Inspections of materials may be accomplished by discharging the vehicle load in an area designed to contain potentially hazardous wastes that may arrive at the facility. The waste should be carefully spread for observation using a front end loader or other piece of equipment. Personnel should be trained to identify suspicious wastes. Some indications of suspicious wastes are:

- Hazardous placards or markings;
- Liquids;
- Powders or dusts;
- Sludges;
- Bright or unusual colors;
- Drums or commercial size containers; or
- Chemical odors.

Wayne County shall follow these procedures when suspicious wastes are discovered.

- Segregate the wastes;
- Question the driver;
- Review the manifest (if applicable);
- Contact possible source;
- Call the State Solid and Hazardous Waste Management Department;
- Use appropriate protective equipment;
- Contact laboratory support if required; and
- Notify the local Hazardous Material Response Team and Law Enforcement Agency

Containers with contents that are not easily identifiable, such as unmarked 55-gallon drums, should be opened only by properly trained personnel. Because these

drums could contain hazardous waste, they should be refused whenever possible. Upon verifying that the solid waste is acceptable, it may then be transferred to the working face for disposal.

Testing typically would include the Toxicity Characteristic Leaching Procedure (TCLP) and other tests for characteristics of hazardous wastes including corrositivity, ignitability, and reactivity. Wastes that are suspected of being hazardous should be handled and stored as a hazardous waste until a determination is made.

If the wastes temporarily stored at the site are determined to be hazardous, Wayne County is responsible for the management of the waste. If the wastes are to be transported from the facility, the waste must be: (1) stored at the MSWLF facility in accordance with requirements of a hazardous waste generator, (2) manifested, (3) transported by a licensed Treatment, Storage, or Disposal (TSD) facility for disposal.

E. RECORD KEEPING AND NOTIFICATION REQUIREMENTS

Records must be kept pursuant to an incident where regulated hazardous waste or prohibited waste is found at the landfill. It is also recommended that records be kept of all screening activities and incidents, whether or not, regulated or prohibited wastes are found. This will help prove that the landfill owner/operator has acted in a prudent and reasonable manner.

The best way to prove compliance with this requirement is to document each inspection including:

- Date and time of waste detection
- Hauler name (company and driver)
- Waste(s) detected
- Waste generator(s) if able to identify
- Action(s) taken to manage or return material(s)
- Efforts taken if extreme toxicity or hazard was discovered
- Landfill employee in responsible charge

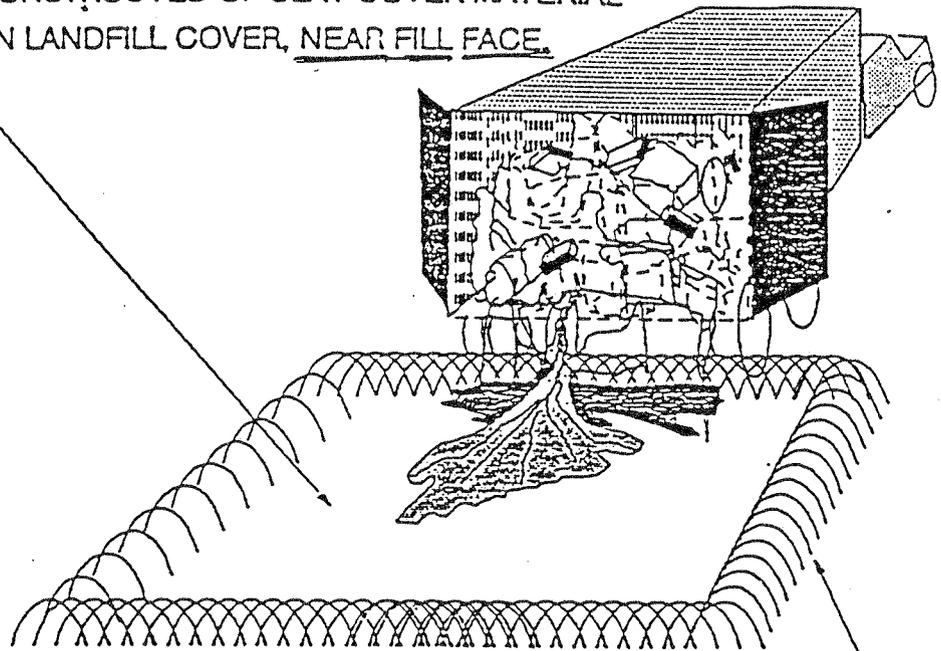
40 CFR Part 258 requires that records should be maintained at or near the landfill site during its active life and as long after as may be required by the appropriate state or local regulations. (Figure 4)

SIMPLE WASTE SCREENING PAD

FOR SANITARY LANDFILLS

MINIMUM SIZE PAD 35 FT. x 35 FT.
DEPTH OF PAD 1.5 FT. TO 2.0 FT.

PAD CONSTRUCTED OF CLAY COVER MATERIAL
ON LANDFILL COVER, NEAR FILL FACE.



BERM TO CONTAIN AND/OR CONTROL WASTE
TEMPORARY CONSTRUCTION USING COVER SOILS

UPON DISCOVERY OF UNACCEPTABLE MATERIAL
REMOVE WASTE AND THAT PORTION OF THE PAD
WHICH HAS BECOME CONTAMINATED BY THE UNACCEPTABLE.

Figure 1

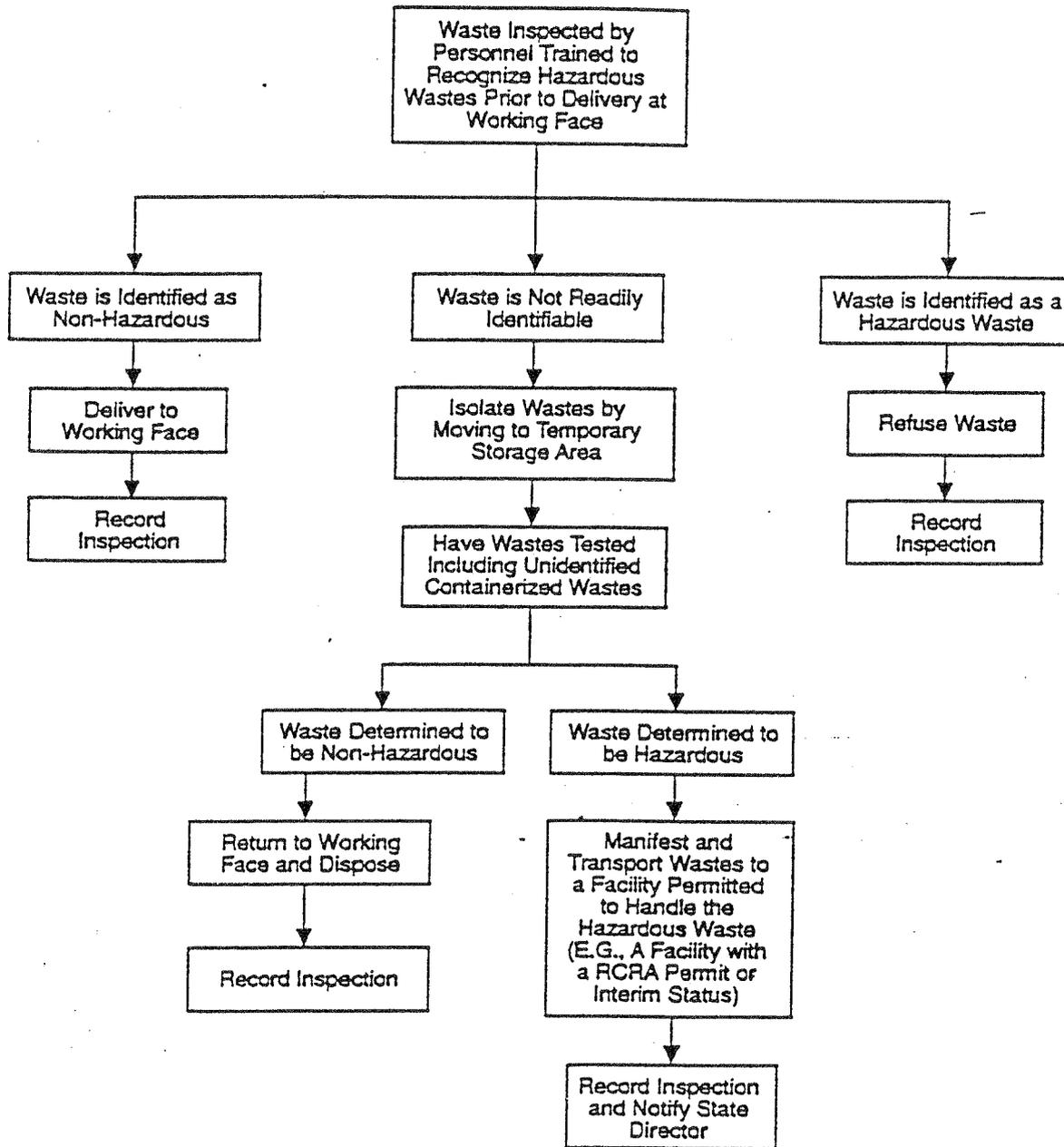


Figure 2
Hazardous Waste Inspection Decision Tree
Inspection Prior to Working Face

WASTE SCREENING CHECK LIST	YES	NO
CONTAINERS		
FULL.....	_____	_____
PARTIALLY FULL.....	_____	_____
EMPTY.....	_____	_____
CRUSHED.....	_____	_____
PUNCTURED.....	_____	_____
POWDERS/DUSTS		
IDENTIFIED.....	_____	_____
UNKNOWN.....	_____	_____
SATURATION.....	_____	_____
LABEL/HAZARDOUS.....	_____	_____
ODOR/FUMES		
STRONG.....	_____	_____
FAINT.....	_____	_____
HEAT.....	_____	_____
ITEMS FOUND		
BATTERIES.....	_____	_____
OIL.....	_____	_____
BIOMEDICAL.....	_____	_____
RADIOACTIVE.....	_____	_____
ASHES/RESIDUE.....	_____	_____
SOD/SOIL.....	_____	_____
CHECK ALL THAT APPLY		

FIGURE 3

DETAILED SCREENING REPORT

WASTE SOURCE _____
ADDRESS _____

PROBABLE [] SUSPECTED [] CONFIRMED []

WASTE HAULER _____
ADDRESS _____

DRIVER'S NAME _____
DETAIL _____

NOTIFIED:

WASTE SOURCE [] HAULING MANAGEMENT [] SITE MANAGEMENT []
STATE [] FEDERAL []

NAME _____
WITNESS (IF ANY) _____
DATE _____ TIME _____ AM PM

ACTION REQUIRED

Figure 4

APPENDIX II

WAYNE COUNTY SYNTHETIC COVER OPERATION PLAN

1. Determine the size of the area to be covered. Be sure to allow for five to ten feet extra on each measurement to ensure that the refuse is completely covered.
2. The synthetic cover is shipped to the landfill site with panels folded accordion-type, then rolled up. Unroll the cover along the working face (depending upon operations), and attach the leading edge of the unrolled panel to existing landfill equipment (i.e., to the top of the blade). Attach with ropes, chains, hooks or clamps -- whichever works better for the site.
3. Pull the sewn panels of cover across the compacted trash. The synthetic cover maybe pulled from any direction, which may vary from day to day. Keep the leading edge between the two machines (or people) as high as possible to eliminate drag.
4. Anchor the edges of synthetic cover every 20 feet with tires or sandbags to hold the synthetic cover in place. If it is windy, more anchoring may be required. Make sure a large enough panel has been ordered to completely cover the refuse (base this on the heaviest day to the week). If complete coverage is not possible, cover the exposed refuse with soil; but take care not to place too much dirt on the synthetic cover if it is to be re-used.
5. On the next day of operations, remove the tires and/or sandbags. Simply pull the synthetic cover across itself (to reduce drag) and off the refuse to an area that is inactive. Anchor the edges again to prevent wind from lifting the blanket. At the end of the day, pull the synthetic cover back across the refuse by repeating steps 3 and 4 until a new panel is needed.

Synthetic Cover is designed to be used as landfill daily cover on a working face. For best results, it is recommended that the area to be covered be kept as close to a square shape as possible not to exceed 120' X 120' in size. Not only does this procedure allow for easier coverage, it allows for better management of the working face and saves time at the end of the working day. Areas larger than 120' X 120' may require three pieces of landfill equipment to pull the synthetic cover across the compacted refuse.

Wayne County will use a panel of synthetic cover that is pulled over the working face on a daily basis by two pieces of landfill equipment. At the end of the working day, the panel will be secured in place. This is attained by one of two methods -- the panel may be heavy enough to hold itself in place due to accumulation of moisture and is left in that manner; or tires are placed on the panel to secure it in place.

The working face is operated in this manner, brought to a grade and then covered with the required six (6) inches of soil. The process will continue until a lift is completed. The process is then started over on the next lift until the landfill is filled to final grade and a section is closed.

TIPS TO REMEMBER

1. Always pull the fabric across itself during installation and removal to make each panel last as long as possible.
2. Avoid driving on the panel(s); this may cause punctures and tears.
3. Tie the panel(s) to the top of the dozer blade and raise the blade to minimize dragging on refuse.
4. Use tires or sandbags to hold the panel(s) down overnight. Soil can be used if you plan to leave panel(s) in place and cover with refuse.
5. Minimize stress between dozer/compactors while pulling on the panel(s).

APPENDIX III

EXPLOSIVE GAS CONTROL PLAN FOR - WAYNE COUNTY

Quarterly the Wayne County landfill will monitor the explosive gas at the landfill structures and at or near the landfill boundary. The monitoring system will consist of two phases. Temporary probes will be placed in the ground as depicted in the operation drawings. The probes are holes that are two - three feet deep either poked in the ground or hand excavated. The top of the hole is then plugged by some means such as a plastic soft drink bottle. The second phase will consist of a plastic stand pipe similar to a piezometer used for groundwater detection. A typical permanent methane probe is detailed in the operation drawings. The permanent probes will be installed by October 9, 1994.

The gas can be detected by use of an instrument that reports the percent of lower explosive limit. An instrument that can be used is the Gas Tech GP 204 which can be purchased from Safety Supply America of Lexington, NC at 704-956-2131.

Quarterly, a County employee will visit each monitoring point either the temporary or permanent. Using the detection instrument, he will determine if methane gas has filled the probes. If the probe is near the property line and methane gas is detected, it must then be determined if the gas is migrating across the landfill boundary. If the probe is on the boundary or methane gas has migrated beyond the boundary, a remediation plan must be completed by Wayne County.

Other points of monitoring will be the landfill structures. If methane gas is detected beyond 25% of its lower explosive limit, then a remediation plan is stated in the operational requirements.

T.C.L.P. CONSTITUENTS & REGULATORY LEVELS (mg/L)

CONSTITUENT	REG LEVEL	CONSTITUENT	REG LEVEL
Arsenic	5.0	Hexachlorobenzene	0.13
Barium	100	Hexachloro-1,3-butadiene	0.5
Benzene	0.5	Hexachloroethane	3.0
Cadmium	1.0	Lead	5.0
Carbon Tetrachloride	0.5	Lindane	0.4
Chlordane	0.03	Mercury	0.2
Chlorobenzene	100	Methoxychlor	10.0
Chloroform	6.0	Methyl ethyl ketone	200
Chromium	5.0	Nitrobenzene	2.0
m-Cresol	200	Pentachlorophenol	100
o-Cresol	200	Pyridine	5.0
p-Cresol	200	Selenium	1.0
Cresol	200	Silver	5.0
1,4-Dichlorobenzene	10.0	Tetrachloroethylene	0.7
1,2-Dichloroethane	0.7	Toxaphene	0.5
1,1-Dichloroethylene	0.5	Trichloroethylene	0.5
2,4-Dichlorophenoxyacetic acid	0.7	2,4,5-Trichlorophenol	400
2,4-Dinitrotoluene	0.13	2,4,6-Trichlorophenol	2.0
Endrin	0.02	2,4,5-TP (Silvex)	1.0
Heptachlor (and its hydroxide)	0.008	Vinyl Chloride	0.2

TABLE 1

By law PCB's are no longer used as dielectrics in transformers and capacitors manufactured after 1979. There are many millions of pounds of PCBs still in use or in storage. One example is the ballasts used in fluorescent light fixtures. It has been estimated that there are between 0.5 million and 1.5 billion ballasts currently in use in this country. Due to the long life of these units, about half of these may be of pre-1979 manufacture and contain PCBs. Since each ballast contains about one ounce of nearly pure PCB fluid, there are about **20 to 30 million pounds** of PCBs in existing lighting fixtures. These items are not the subject to RCRA Subtitle D Waste Screening!

Commercial or industrial sources of PCB wastes that should be addressed by the program include:

- Mineral oil and dielectric fluids containing PCBs;
- Contaminated soil, dredged material, sewage sludge, rags, and other debris from a release of PCBs;
- Transformers and other electrical equipment containing dielectric fluids; and
- Hydraulic machines.

2. PCB Regulatory Requirements

As contrasted to hazardous wastes, RCRA regulates PCBs based on the concentration of PCBs in the waste rather than the source or characteristic of the waste. The regulations concerning PCB disposal are spelled out in 40 CFR Part 761. Subtitle D of RCRA merely requires that PCB waste not be disposed in a MSW landfill. PCB management requirements include:

Waste containing more than 500 ppm of PCBs must be incinerated. Waste containing from 50 to 500 ppm must be disposed of by incineration, approved burning, or in chemical waste landfill permitted to receive such wastes. The regulations are silent concerning wastes containing less than 50 ppm of PCBs; however, the regulations cannot be circumvented by diluting stronger wastes.

D. FUNDAMENTALS OF WASTE SCREENING

1. Know Your Generators and Haulers

Since the level of sophistication of your waste screening program will be a reflection of the likelihood of hazardous waste and PCB waste being in your incoming waste, **knowledge of the commercial industrial base of your service area is critical.** Some examples are the automotive industry, which generates solvents, paint wastes, lead acid batteries, grease and oil; the dry cleaning industry,

which may generate filters containing dry cleaning solvents; metal platers which generate heavy metal wastes; and other industries which generate a variety of undesirable wastes; e.g. chemical and related products, petroleum refining, primary metals, electrical and electronic machinery, etc.

Landfill managers should also know the haulers and trucks serving the businesses in their community which are likely to carry unacceptable wastes.

Some local governments and solid waste management agencies have enacted legislation requiring haulers to provide a manifest showing the customers whose wastes make up that particular load. Such a manifest is an extremely useful tool when a load is found to contain prohibited wastes. It is unwise to accept wastes from unknown, unlicensed, or otherwise questionable haulers.

2. Inspections

An inspection is typically a visual observation of the incoming waste loads by an individual who is trained to identify regulated hazardous or PCB wastes that would not be acceptable for disposal at the MSWLF unit. An inspection is considered satisfactory if the inspector knows the nature of all materials received in the load and is able to discern whether the materials are potentially regulated hazardous wastes or PCB wastes.

Ideally, all loads should be screened; however, it is generally not practical to inspect in detail all incoming loads. Random inspections, therefore, can be used to provide a reasonable means to adequately control the receipt of inappropriate wastes. Random inspections are simply inspections made on less than every load.

The frequency of random inspections may be based on the type and quantity of wastes received daily, and the accuracy and confidence desired in conclusions drawn from inspection observations. Because statistical parameters are not provided in the regulation, a reasoned, knowledge-based approach may be taken. A random inspection program may take many forms such as inspecting every incoming load one day out of every month or inspecting one or more loads from transporters of wastes of unidentifiable nature each day. If these inspections indicate that unauthorized wastes are being brought to the MSWLF site, the random inspection program should be modified to increase the frequency of inspections.

Inspection frequency also can vary depending on the nature of the waste. For example, wastes received predominantly from commercial or industrial sources may require more frequent inspections than wastes predominantly from households.

Inspection priority also can be given to haulers with unknown service areas, to loads brought to the facility in vehicles not typically used for disposal of municipal solid waste, and to loads transported by previous would-be offenders. For wastes of unidentifiable nature received from sources other than households (e.g., industrial or commercial establishments), the inspector should question the transporter about the source/composition of the materials.

Loads should be inspected prior to actual disposal of the waste at the working face of the landfill unit to provide the County the opportunity to refuse or accept the wastes. Inspections can be conducted on a tipping floor located near the facility scale house, inside the site entrance, or near, or adjacent to, the working face of the landfill unit. (Figure 1)

An inspection flow chart to identify, accept, or refuse solid waste is provided as Figure 2.

Inspections of materials may be accomplished by discharging the vehicle load in an area designed to contain potentially hazardous wastes that may arrive at the facility. The waste should be carefully spread for observation using a front end loader or other piece of equipment. Personnel should be trained to identify suspicious wastes. Some indications of suspicious wastes are:

- Hazardous placards or markings;
- Liquids;
- Powders or dusts;
- Sludges;
- Bright or unusual colors;
- Drums or commercial size containers; or
- Chemical odors.

Wayne County shall follow these procedures when suspicious wastes are discovered.

- Segregate the wastes;
- Question the driver;
- Review the manifest (if applicable);
- Contact possible source;
- Call the State Solid and Hazardous Waste Management Department;
- Use appropriate protective equipment;
- Contact laboratory support if required; and
- Notify the local Hazardous Material Response Team and Law Enforcement Agency

Containers with contents that are not easily identifiable, such as unmarked 55-gallon drums, should be opened only by properly trained personnel. Because these

drums could contain hazardous waste, they should be refused whenever possible. Upon verifying that the solid waste is acceptable, it may then be transferred to the working face for disposal.

Testing typically would include the Toxicity Characteristic Leaching Procedure (TCLP) and other tests for characteristics of hazardous wastes including corrosivity, ignitability, and reactivity. Wastes that are suspected of being hazardous should be handled and stored as a hazardous waste until a determination is made.

If the wastes temporarily stored at the site are determined to be hazardous, Wayne County is responsible for the management of the waste. If the wastes are to be transported from the facility, the waste must be: (1) stored at the MSWLF facility in accordance with requirements of a hazardous waste generator, (2) manifested, (3) transported by a licensed Treatment, Storage, or Disposal (TSD) facility for disposal.

E. RECORD KEEPING AND NOTIFICATION REQUIREMENTS

Records must be kept pursuant to an incident where regulated hazardous waste or prohibited waste is found at the landfill. It is also recommended that records be kept of all screening activities and incidents, whether or not, regulated or prohibited wastes are found. This will help prove that the landfill owner/operator has acted in a prudent and reasonable manner.

The best way to prove compliance with this requirement is to document each inspection including:

- Date and time of waste detection
- Hauler name (company and driver)
- Waste(s) detected
- Waste generator(s) if able to identify
- Action(s) taken to manage or return material(s)
- Efforts taken if extreme Toxicity or hazard was discovered
- Landfill employee in responsible charge

40 CFR Part 258 requires that records should be maintained at or near the landfill site during its active life and as long after as may be required by the appropriate state or local regulations. (Figure 4)

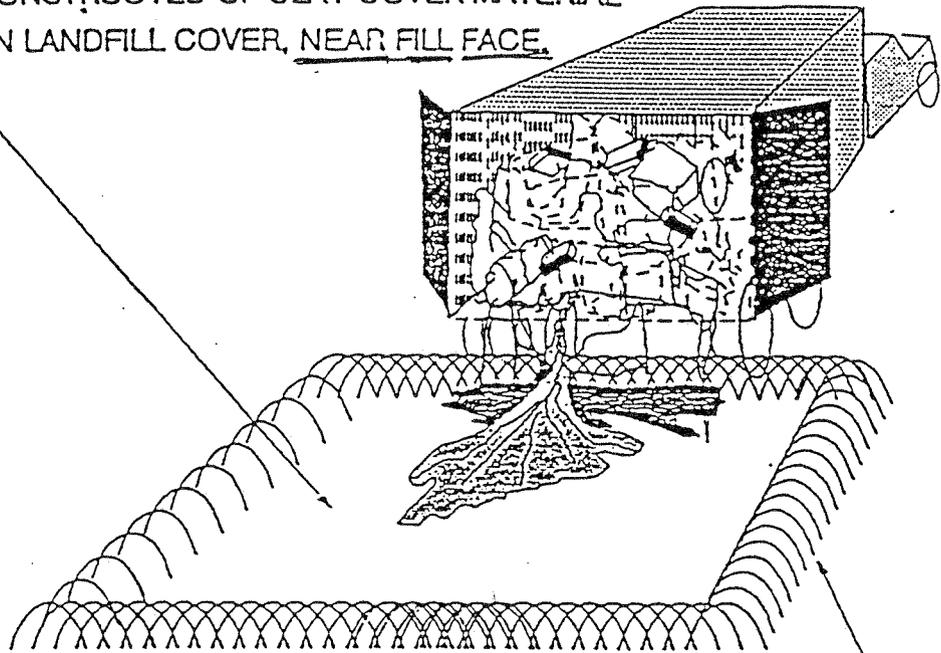
SIMPLE WASTE SCREENING PAD

FOR SANITARY LANDFILLS

MINIMUM SIZE PAD 35 FT. x 35 FT.

DEPTH OF PAD 1.5 FT. TO 2.0 FT.

PAD CONSTRUCTED OF CLAY COVER MATERIAL
ON LANDFILL COVER, NEAR FILL FACE.



BERM TO CONTAIN AND/OR CONTROL WASTE
TEMPORARY CONSTRUCTION USING COVER SOILS

UPON DISCOVERY OF UNACCEPTABLE MATERIAL
REMOVE WASTE AND THAT PORTION OF THE PAD
WHICH HAS BECOME CONTAMINATED BY THE UNACCEPTABLE.

Figure 1

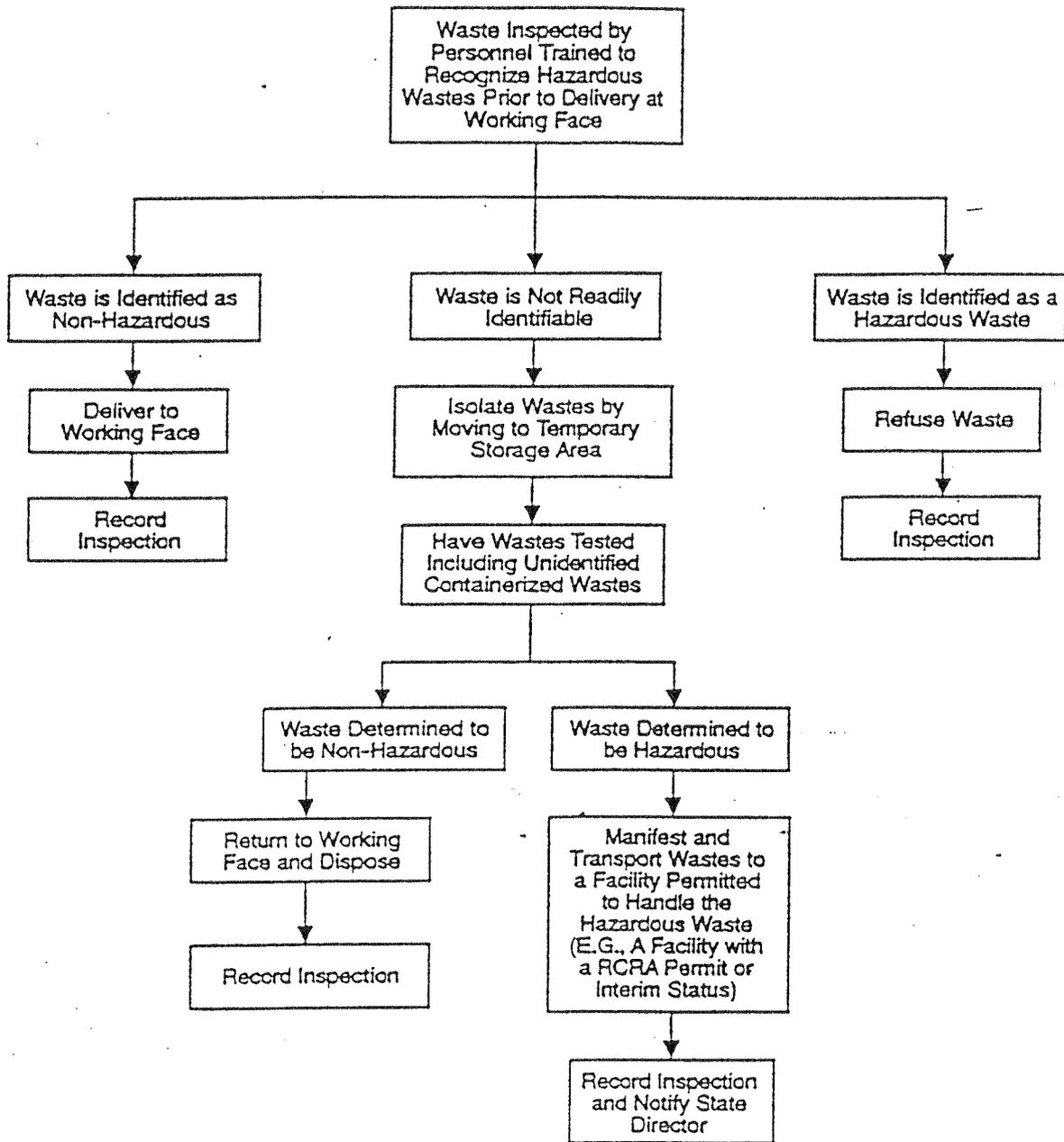


Figure 42
 Hazardous Waste Inspection Decision Tree
 Inspection Prior to Working Face

WASTE SCREENING CHECK LIST	YES	NO
CONTAINERS		
FULL.....	_____	_____
PARTIALLY FULL.....	_____	_____
EMPTY.....	_____	_____
CRUSHED.....	_____	_____
PUNCTURED.....	_____	_____
POWDERS/DUSTS		
IDENTIFIED.....	_____	_____
UNKNOWN.....	_____	_____
SATURATION.....	_____	_____
LABEL/HAZARDOUS.....	_____	_____
ODOR/FUMES		
STRONG.....	_____	_____
FAINT.....	_____	_____
HEAT.....	_____	_____
ITEMS FOUND		
BATTERIES.....	_____	_____
OIL.....	_____	_____
BIOMEDICAL.....	_____	_____
RADIOACTIVE.....	_____	_____
ASHES/RESIDUE.....	_____	_____
SOD/SOIL.....	_____	_____
CHECK ALL THAT APPLY		

FIGURE 3

DETAILED SCREENING REPORT

WASTE SOURCE _____
ADDRESS _____

PROBABLE [] SUSPECTED [] CONFIRMED []

WASTE HAULER _____
ADDRESS _____

DRIVER'S NAME _____
DETAIL _____

NOTIFIED:

WASTE SOURCE [] HAULING MANAGEMENT [] SITE MANAGEMENT []
STATE [] FEDERAL []

NAME _____
WITNESS (IF ANY) _____
DATE _____ TIME _____ AM PM

ACTION REQUIRED

Figure 4

APPENDIX II

WAYNE COUNTY SYNTHETIC COVER OPERATION PLAN

1. Determine the size of the area to be covered. Be sure to allow for five to ten feet extra on each measurement to ensure that the refuse is completely covered.
2. The synthetic cover is shipped to the landfill site with panels folded accordion-type, then rolled up. Unroll the cover along the working face (depending upon operations), and attach the leading edge of the unrolled panel to existing landfill equipment (i.e., to the top of the blade). Attach with ropes, chains, hooks or clamps -- whichever works better for the site.
3. Pull the sewn panels of cover across the compacted trash. The synthetic cover maybe pulled from any direction, which may vary from day to day. Keep the leading edge between the two machines (or people) as high as possible to eliminate drag.
4. Anchor the edges of synthetic cover every 20 feet with tires or sandbags to hold the synthetic cover in place. If it is windy, more anchoring may be required. Make sure a large enough panel has been ordered to completely cover the refuse (base this on the heaviest day to the week). If complete coverage is not possible, cover the exposed refuse with soil; but take care not to place too much dirt on the synthetic cover if it is to be re-used.
5. On the next day of operations, remove the tires and/or sandbags. Simply pull the synthetic cover across itself (to reduce drag) and off the refuse to an area that is inactive. Anchor the edges again to prevent wind from lifting the blanket. At the end of the day, pull the synthetic cover back across the refuse by repeating steps 3 and 4 until a new panel is needed.

Synthetic Cover is designed to be used as landfill daily cover on a working face. For best results, it is recommended that the area to be covered be kept as close to a square shape as possible not to exceed 120' X 120' in size. Not only does this procedure allow for easier coverage, it allows for better management of the working face and saves time at the end of the working day.

Wayne County will use a panel of synthetic cover that is pulled over the working face on a daily basis by two pieces of landfill equipment. At the end of the working day, the panel will be secured in place. This is attained by one of two methods -- the panel may be heavy enough to hold itself in place due to accumulation of moisture and is left in that manner; or tires are placed on the panel to secure it in place.

REV 9/94

The working face is operated in this manner, brought to an intermediate grade and then covered with the required six (6) inches of soil. The process will continue until a lift is completed. The process is then started over on the next lift until the landfill is filled to final grade and a section is closed. Wayne County will not use the synthetic cover for more than six (6) consecutive days without applying a 6" soil cover.

TIPS TO REMEMBER

1. Always pull the fabric across itself during installation and removal to make each panel last as long as possible.
2. Avoid driving on the panel(s); this may cause punctures and tears.
3. Tie the panel(s) to the top of the dozer blade and raise the blade to minimize dragging on refuse.
4. Use tires or sandbags to hold the panel(s) down overnight. Soil can be used if you plan to leave panel(s) in place and cover with refuse.
5. Minimize stress between dozer/compactors while pulling on the panel(s).

REV 9/94

APPENDIX III

EXPLOSIVE GAS CONTROL PLAN FOR - WAYNE COUNTY

Quarterly the County of Wayne landfill will monitor the explosive gas at the landfill structures and at or near the landfill boundary. The monitoring system will consist of two phases. Temporary probes (phase 1) will be placed in the ground as depicted in the operation drawings. The probes are holes that are two - three feet deep either poked in the ground or hand excavated. The top of the hole is then plugged by some means such as a plastic soft drink bottle. The second phase (permanent probes) will consist of a plastic stand pipe similar to a piezometer used for groundwater detection. A typical permanent methane probe is detailed in the operation drawings. The permanent probe will be constructed at a depth of six (6) feet. A 6" diameter hole will contain a one (1) inch slotted PVC pipe. The bottom two (2) feet will be backfilled with non-carbonate pea gravel with a bentonite seal one (1) foot thick above it. The remaining three (3) feet will be backfilled with in-situ soils. The one (1) inch PVC pipe will be approximately three (3) feet above the existing grade. The PVC pipe will be capped with a one (1) inch PVC cap, one quarter (1/4) inch NPT hose barb, and 1" tubing, plugged or capped. The permanent probes will be installed by October 9, 1994.

The location and spacing of the methane monitoring probes is somewhat arbitrary. The locations were determined by the relationship of solid waste with property lines and landfill structures. The spacing of the monitoring probes is between 200 and 400 feet. The migration of methane gas is induced by pressure gradients. The methane will move from areas of high pressure to those of low pressure following the path of least resistance. The methane will migrate vertically until it reaches the landfill cap, where it will begin to flow horizontally. This occurs until it finds a pathway out, either by the installed methane collection trenches or migration through the permeable in-situ soils. Since methane is lighter than air, it wants to escape into the atmosphere. It has been our experience that whenever gas is migrating no matter what the spacing or depth of the monitoring probes, the gas will fill the void created by the monitoring point and an explosive meter will monitor the level. The six foot depth of the monitoring probes is to ensure a stable monitoring point. The only time a shallow monitoring point has not worked is in a very heavy, impermeable clay layer that acts as a seal to the migration of the gas. If a clay layer is encountered during the construction of the monitoring points, it will either be moved beyond the clay or excavated to a depth that is in the conductive zone below the clay.

The permanent probes surround the existing and old fill area. This is to check if methane is migrating toward the present landfill boundary.

REV 9/94

The gas can be detected by use of an instrument that reports the percent of lower explosive limit. An instrument that can be used is the Gas Tech GP 204 which can be purchased from Safety Supply America of Lexington, NC at 704-956-2131. The operation and calibration instructions are included in this appendix.

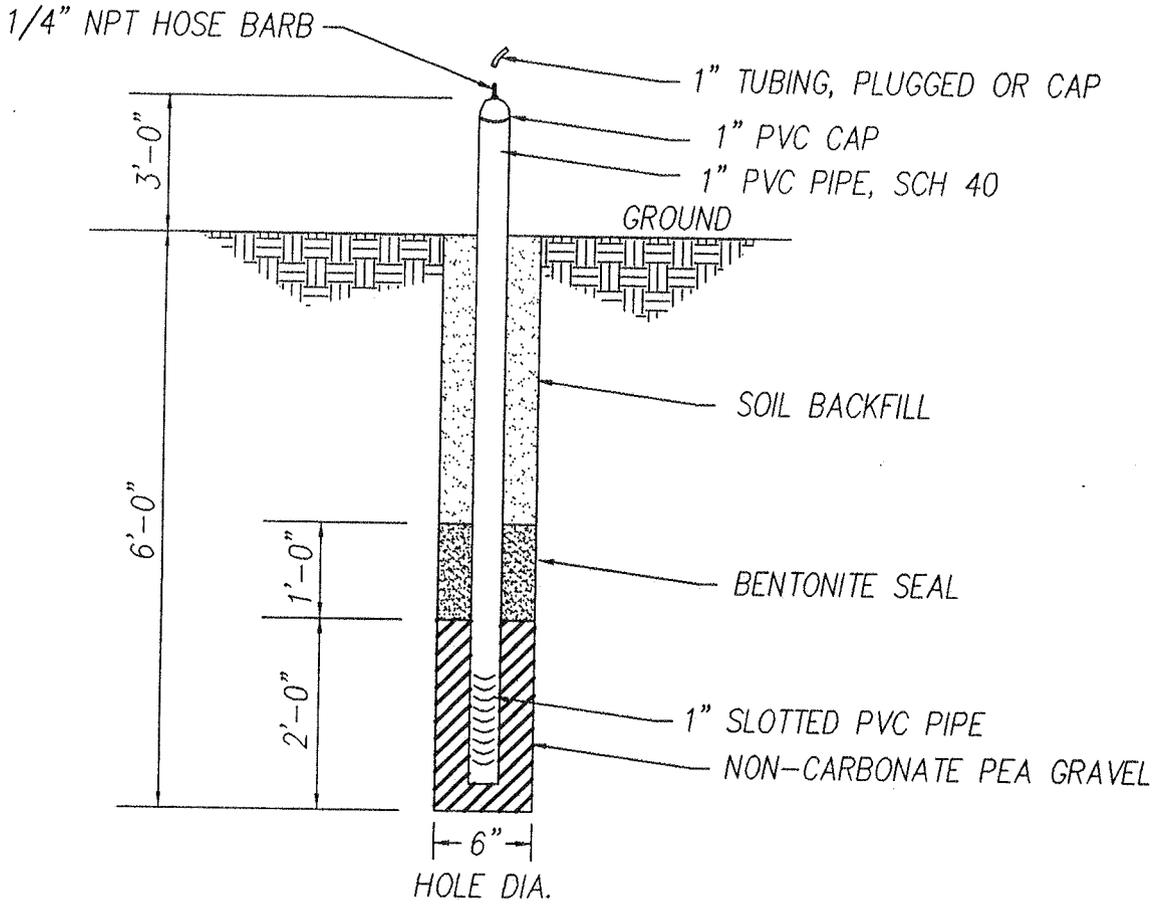
Quarterly, a County employee will visit each monitoring point either the temporary or permanent. The monitoring points consist of all methane probes. Using the detection instrument, he will determine if methane gas has filled the probes. If the probe is near the property line and methane gas is detected at or beyond the lower explosive limit (100% LEL), it must then be determined if the gas is migrating across the landfill boundary. If the probe is on the boundary or methane gas has migrated beyond the boundary, a remediation plan must be completed by Wayne County.

Other points of monitoring will be the landfill structures. Each structure will be monitored for methane using the following methods:

1. All crawl spaces will be monitored;
2. All corners in the structure will be monitored;
3. Any holes, cracks and pipes through the foundation will be monitored

If methane gas is detected beyond 25% of its lower explosive limit in any structure, then a remediation plan is stated in the operational requirements.

REV 9/94



METHANE GAS MONITORING PROBE

N.T.S.

GASTECH

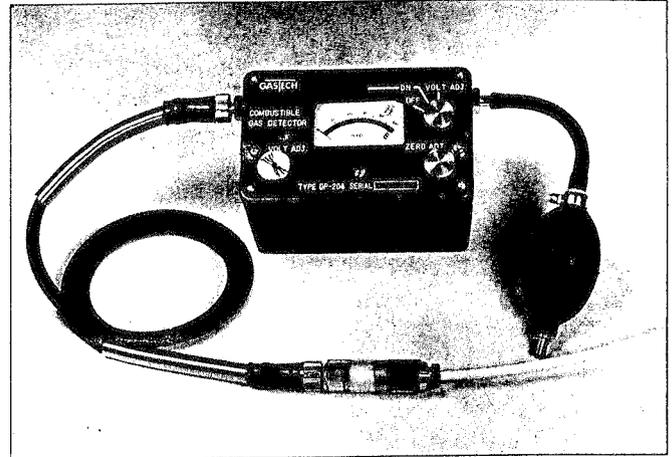
The Trusted Name In Gas Detection

Model GP-204 Combustible Gas Indicator

The Model GP-204 is a compact, dependable monitor for testing areas where combustible gases or vapors can accumulate. It is easy to operate, and is designed to be used in demanding field conditions.

The GP-204 measures combustible gases over a range of 0 - 100% LEL. Gas Tech's reliable catalytic sensor is the heart of the GP-204. This sensor provides fast, accurate, repeatable responses to a wide variety of combustible gases. Gas concentrations are displayed on a large, illuminated meter. The GP-204 is normally calibrated to methane, but other calibrations may be specified.

Standard accessories for the GP-204 include a sturdy carrying case with shoulder strap, an aspirator bulb, tubing, a probe and filter, batteries, and an operators manual.



SPECIFICATIONS

Gases detected	Range
Combustibles	0 - 100% LEL
Sensor	Catalytic combustion
Sampling method	Hand aspirated bulb
Response time	30 seconds to 90%
Accuracy/Repeatability	±10%/±5%
Operating temperature	0° - 120°F (-15 to 50°C)
Display	Analog meter
Power source	Two "D" size alkaline or Ni-Cad batteries
Battery life	Alkaline: 5 hours Ni-Cad: 4 hours
External Controls	On/Off switch, sensor voltage adjust, zero adjust
Dimensions/weight	6 1/2" L X 4 1/2" W X 5 1/2" H 5 pounds
Case material	Enameled aluminum
Intrinsic safety rating	Class 1, Div. 1, Groups C & D
Warranty	One year material and workmanship

ORDERING INFORMATION

Item	Cat #
GP-204 (Ni-Cad version)	72-0100HD
GP-204 (Alkaline version)	72-0110HD
Standard Accessories	
Carrying case and strap	20-0252
Aspirator bulb with tube	30-0401
Combustible sensor assembly	62-0110
Operators manual	71-0061
3' hose, teflon-lined	80-0001
10" probe with filter	80-0150
Alkaline battery "D" size (72-0110HD)	49-1201
Ni-Cad battery "D" size (72-0100HD)	49-1501
Charger, 115V (72-0100HD)	49-2011
Optional Accessories	
Test kit	81-0202

GASTECH

The Trusted Name In Gas Detection

8407 Central Avenue / Newark / CA 94560-3431

PH (510) 745-8700 FAX (510) 794-6201 TLX 334-462

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DISTR!

**SAFETY
SUPPLY
AMERICA**
AT FLOOD INTERNATIONAL COMPANY

Mary Pardue

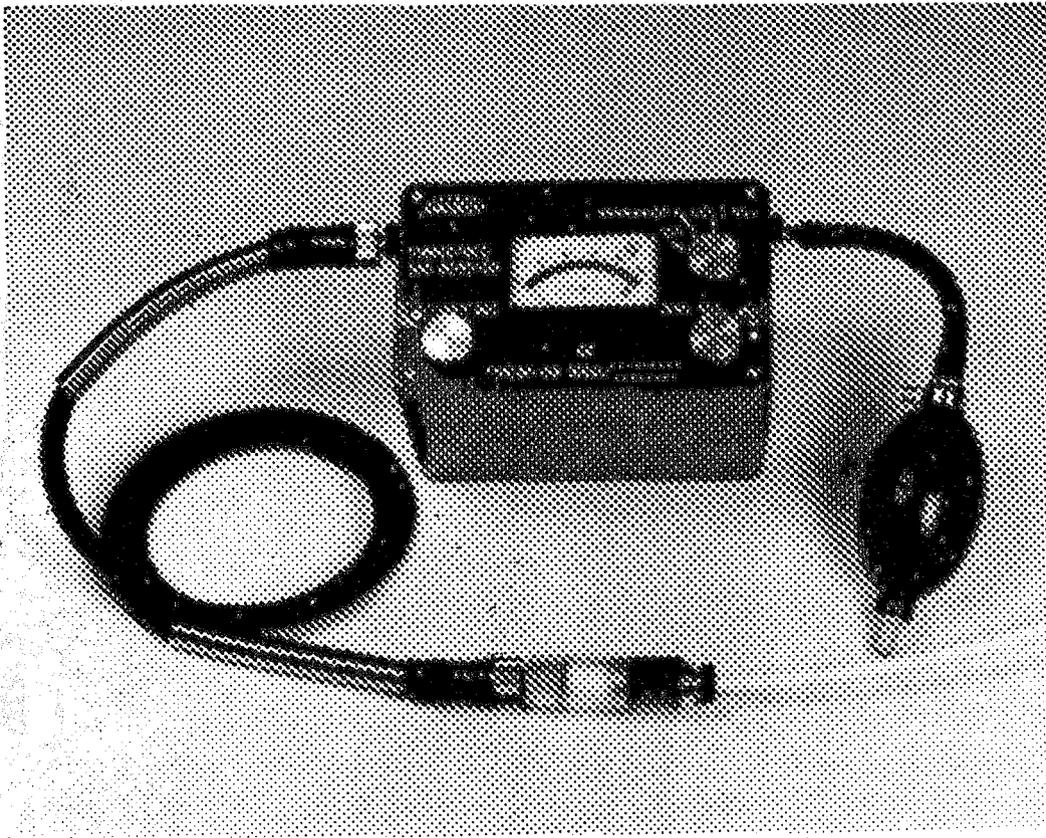
Customer Service Representative

Safety Supply America
10 Sapona Business Park
P.O. Box 645
Lexington, NC 27293-0645
Phone: 704/956-2131
Was: 800/772-6733
REV 9/94
Fax: 704/956-1693

GASTECH

**COMBUSTIBLE GAS INDICATOR
MODEL GP-204**

INSTRUCTION MANUAL



**MADE BY
GASTECH, INC.**

8445 CENTRAL AVE., NEWARK, CA 94560

INSTRUCTION MANUAL
MODEL GP-204 PORTABLE COMBUSTIBLE GAS INDICATOR

CONTENTS

- I. GENERAL DESCRIPTION
- II. OPERATION
- III. INTERPRETATION
- IV. MAINTENANCE
- V. PRECAUTIONS AND NOTES
- VI. ACCESSORIES
- VII. PARTS LIST
- VIII. CHARTS AND DIAGRAMS

November 1991 Printing

**FOR APPLICATION INFORMATION, ACCESSORIES, SPARE OR
REPLACEMENT PARTS, CONTACT:**

**GASTECH INC.
8445 CENTRAL AVENUE
NEWARK, CALIFORNIA 94560
PHONE: (510) 794-6200
FAX: (510) 794-6210
TELEX: 334-462**

I. GENERAL DESCRIPTION

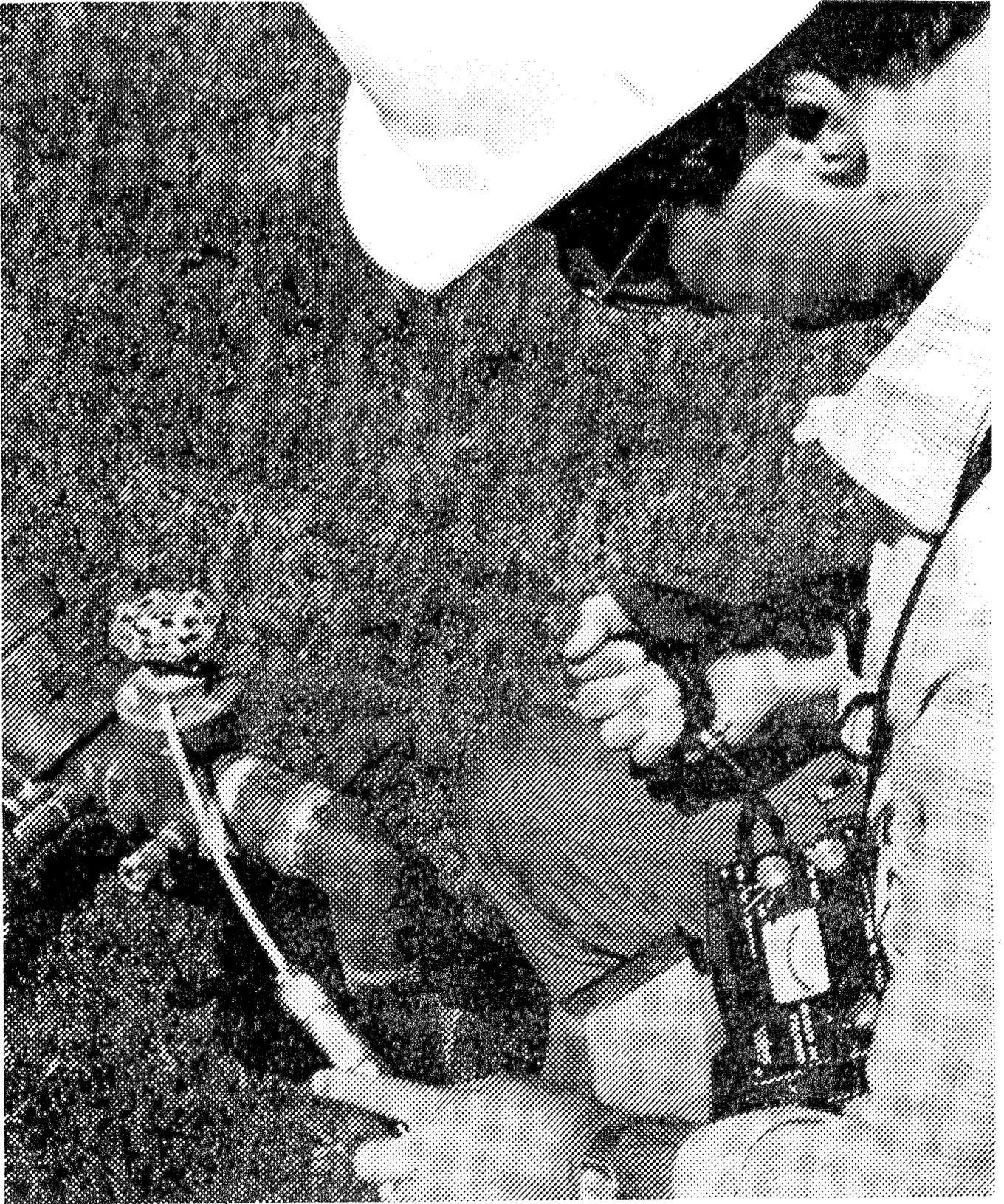
The Model GP-204 Combustible Gas Indicator is a compact battery-operated portable instrument that can be used for taking an air sample and indicating the presence and concentration of combustible gas. Samples of the air under test are drawn by means of a rubber aspirator bulb and analyzed for combustible gas content on a heated platinum filament in a Wheatstone bridge measuring circuit. A built-in meter indicates combustible gas content in units of explosibility.

Power for operation of the instrument is provided by built-in dry cells or optional rechargeable nickel-cadmium batteries. A probe and extension hose permit withdrawal of samples from remote locations and the instrument fits in a compact leather case with over-the-shoulder carrying strap.

The model GP-204 is suitable and recommended for testing tanks, manholes, vessels and other spaces to determine presence or absence of combustible gas. It can also be used to check for leaks in pressure cylinders, pipelines, and other closed systems. It is a valuable aid to safety of operations wherever flammable gas or vapors are handled.

II. OPERATION

Before taking instrument on the job, check battery voltage. To check, put switch in VOLT ADJ position. Meter should rise to the "CHECK" position near top of scale. Lift and turn VOLT ADJ. control clockwise to determine maximum voltage setting. If it cannot be set beyond mark, batteries need recharging or replacement for full capacity. Do not attempt to use instrument at all if reading cannot be set up to mark.



INSTRUMENT IN USE

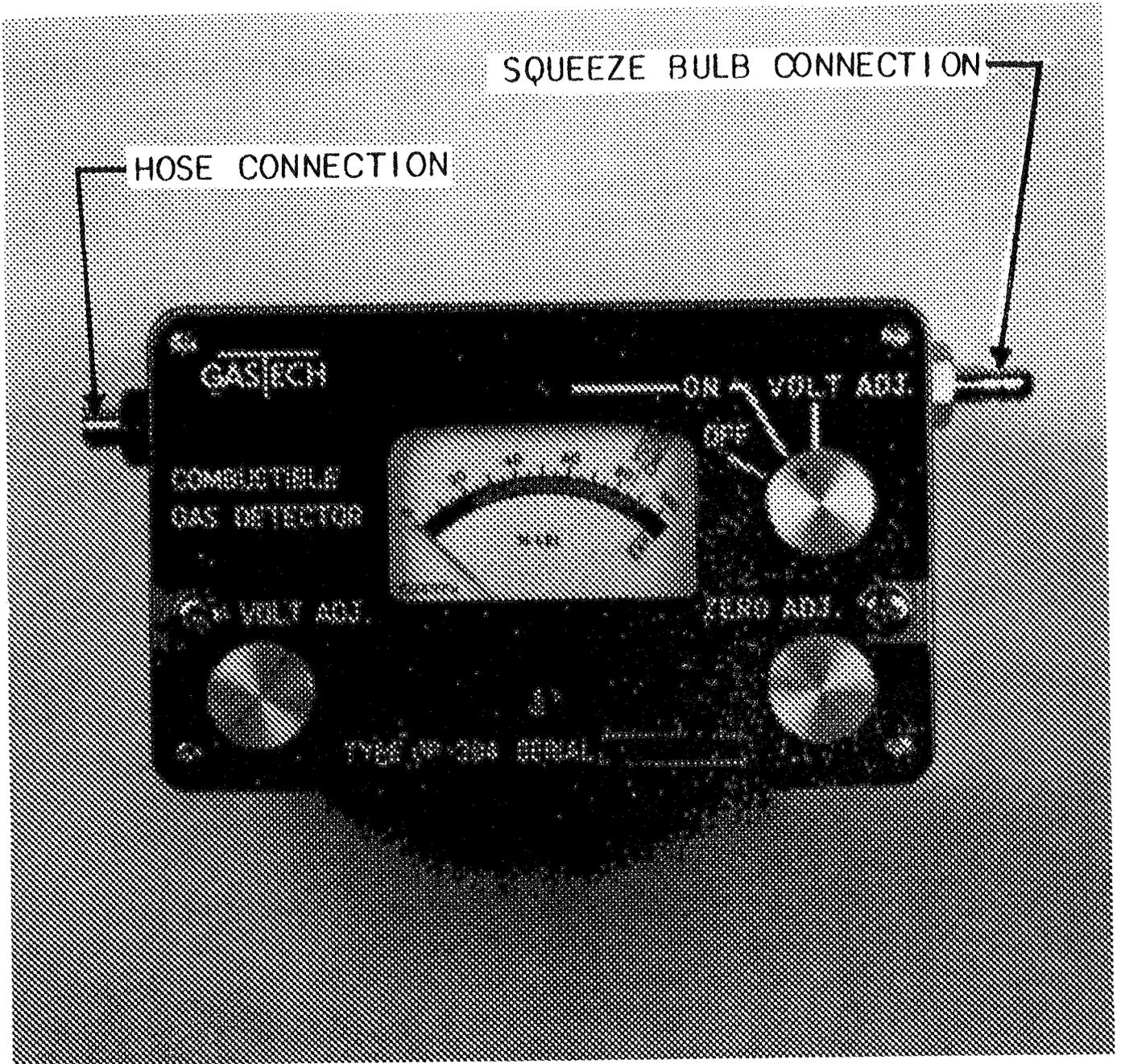
4 GasTech Model GP-204

A. If voltage is satisfactory, continue with the next step of preliminary adjustment as follows:

1. Confirm operation of pilot light/meter illuminating lamp.
2. With sample inlet in fresh air, squeeze bulb several times to flush out any remaining gas.
3. Check zero setting by turning switch to ON position. Meter should read close to zero. Lift and turn ZERO knob to bring reading to exactly 0.
4. Couple sampling hose to instrument inlet on left-hand end, and connect probe to end of hose. Make sure connections are secure.
5. Admit a sample of some combustible gas to end of probe, and confirm that meter needle rises upscale.

B. Instrument is now adjusted and ready to use. It may be turned off and carried to the job. To make gas test, proceed as follows:

1. Turn to VOLT ADJ. position, adjust voltage if necessary, then turn to ON.
2. Hold probe within space to be tested. Squeeze bulb several times while watching meter, and observe maximum reading.
3. After completion of test, remove probe from test space, flush with fresh air for 4 or 5 squeezes of bulb, and turn off.



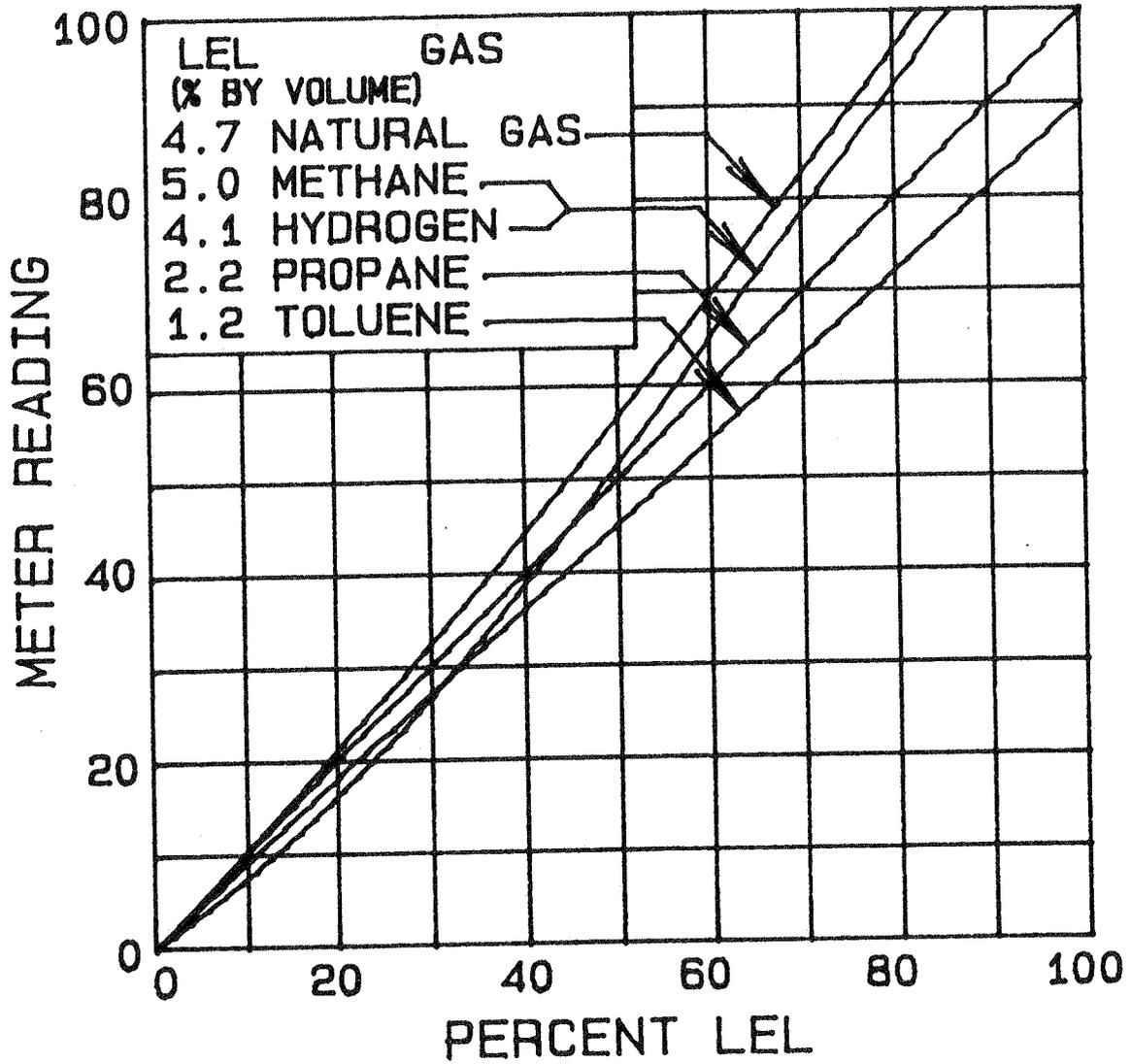
LOCATION OF CONTROLS

III. INTERPRETATION

Meter readings are taken on a scale graduated 0-100% LEL. The abbreviation LEL stands of Lower Explosive Limit, and represents the lowest concentration which will propagate a flame when exposed to a source of ignition, hence the lowest concentration which can produce an explosion. This quantity is also spoken of as the Lower Flammable Limit (LFL).

The Model GP-204 is calibrated before shipment to read 10% higher than true explosibility to give a slight safety factor. That is, a concentration of 90% LEL will produce a reading of 100%, and smaller concentrations will read in proportion. Calibration is based on known mixtures of methane gas in air. Other combustible gases will read approximately correctly in terms of explosibility but for maximum accuracy a calibration curve for the specific substance should be consulted. Typical calibration curves for various gases are shown in Fig. 1. Curves are drawn in terms of percent LEL for both coordinates. Concentrations may also be interpreted in terms of volume percent, by multiplying the percent LEL in the sample (determined from the meter reading and the curve) by the published figure for LEL in volume percent, as noted on the curve. Thus a 40% LEL reading on natural gas represents 36% LEL, which indicates a 1.7% concentration by volume ($36\% \text{ of } 4.7 = 1.7$).

The maximum concentration allowable in a space where personnel are working or where welding operations are carried out is primarily a matter of local regulation and of judgment based on knowledge of conditions. A maximum reading of 10% or 20% is usually allowed. If the recommended September, 1989 OSHA limit of 10% is selected, this is often spoken of as a factor of safety of 10, as the concentration must be increased ten times before explosive conditions are reached.



CALIBRATION CURVE
 TYPICAL GASES AND VAPORS

FIGURE 1

I V. MAINTENANCE

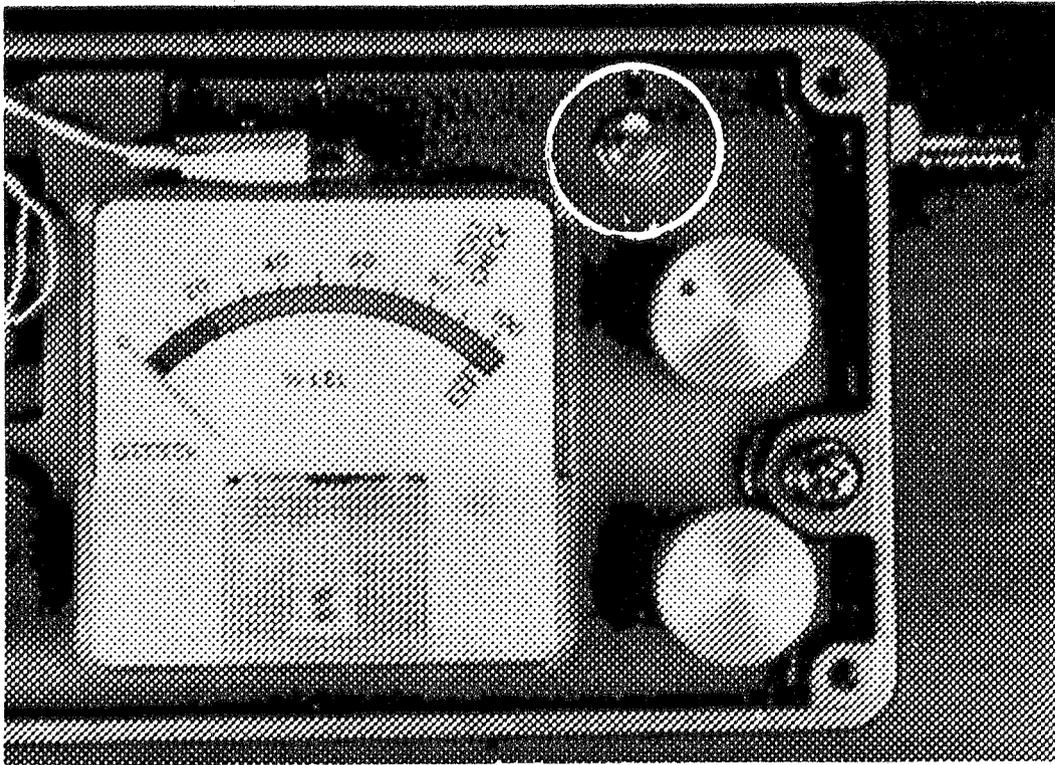
A. Calibration and Adjustment

In addition to the normal operating controls found on the top panel, a calibration adjustment potentiometer is provided. This adjustment is used to set the meter reading to the desired level, while sampling a known concentration of combustible gas.

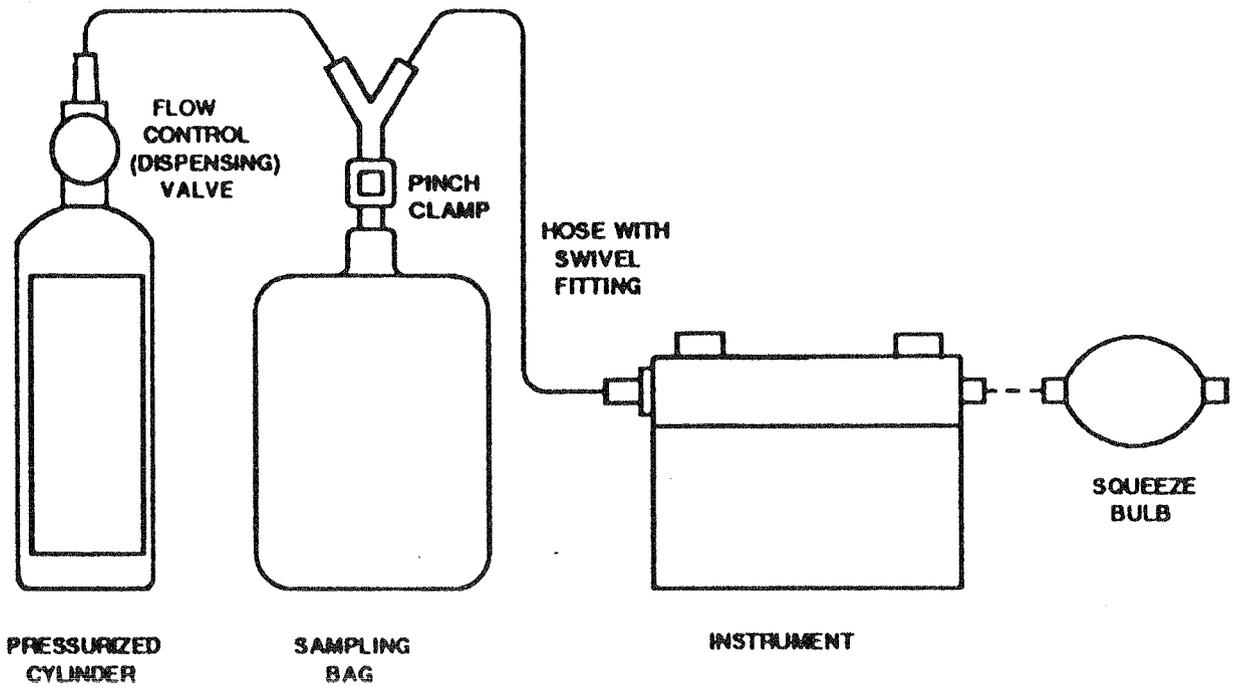
To gain access to the control, the top plate must be removed by taking out the screws in each corner. The calibration potentiometer is a slotted-shaft control located above right upper corner of meter.

To calibrate:

1. Turn on instrument and allow to warm up for at least 5 minutes. Set zero in gas-free air.
2. Remove hose and probe, and attach Calibration Kit with known concentration of combustible gas, e.g., 2.5% natural gas. (See Section VI.D, for connection of Calibration Kit.)
3. Open pinch clamp. Pump squeeze bulb until gas bag is flat.
4. Hold finger over open end of squeeze bulb and slowly open flow control valve on gas cylinder until collecting bag is partially inflated, then close valve.
5. Remove finger and slowly pump squeeze bulb to draw gas from bag.
6. After several pumps of the bulb, meter should respond to presence of gas.
7. Adjust calibration potentiometer to match reading on meter to known concentration (55% LEL for 2.5% natural gas). Turn clockwise to increase meter reading.



LOCATION OF CALIBRATION POTENTIOMETER



CALIBRATION SET-UP

10 GasTech Model GP-204

8. Close pinch clamp on collecting bag to save gas. Disconnect tube from instrument inlet and purge instrument by squeezing bulb. Replace top plate and reconnect hose and probe.
9. Instrument is now calibrated and ready to use.
10. When calibration is complete, remove dispensing valve from cylinder before storage, to prevent loss of cylinder contents, then re-cap cylinder. Sampling bag, dispensing valve, and pinch clamp may be left connected to the tubing for storage.

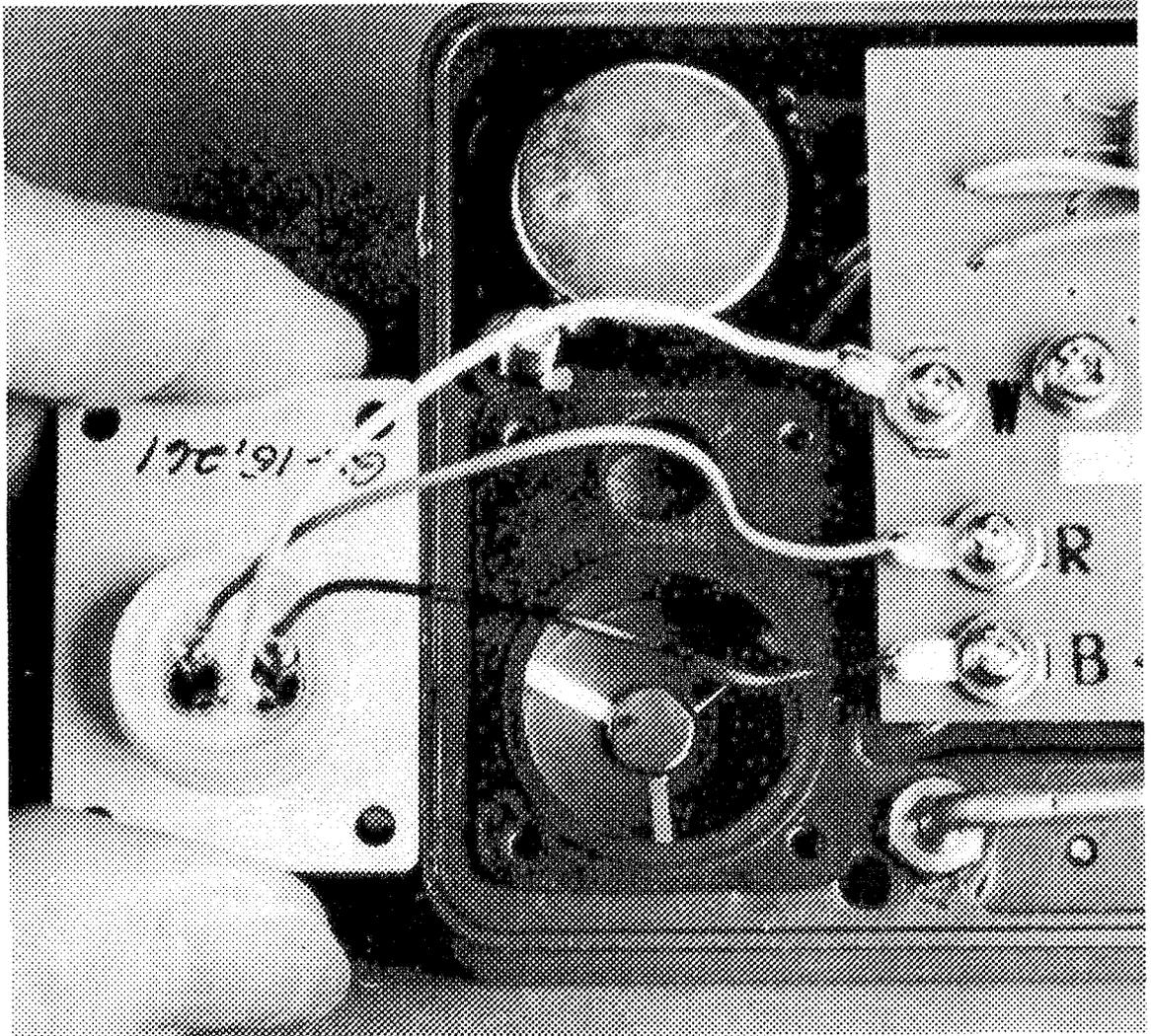
B. Filament Replacement

The filament assembly should be replaced if the flame arrestor is excessively dirty or corroded, zero cannot be set within range of ZERO ADJ., or if meter reading cannot be set high enough on a calibrating gas, using the calibration potentiometer. The assembly consists of a matched pair of filaments, one active and one reference, covered by a flame arrestor and mounted to a retainer plate. To replace:

1. Loosen the two panel hold-down screws, remove and invert top panel.
2. With switch off, loosen (DO NOT REMOVE) the three screws holding the terminals for red, black and white wires. Pull wires from terminals.
3. Remove the four screws holding filament retainer in place. Pull out the filament assembly and replace it with a new one. Check that the gasket is properly located before replacing the screws. Connect wires to terminals as before.

CAUTION: FLAME ARRESTOR CANNOT BE CLEANED WITHOUT DESTROYING THE EFFECTIVENESS OF THE FILAMENTS. REPLACE WITH A COMPLETE FILAMENT ASSEMBLY.

4. Turn instrument on and adjust zero.
5. Admit a combustible gas sample and verify that meter needle moves upscale.
6. If a calibrating gas is available, check response and readjust calibration if necessary.



FILAMENT WIRING

Starting in 1990, the unitized heavy-duty filament/flame arrestor was installed as the standard in place of the multi-part assembly used earlier. Its chlorine resistance is ideal for service that may involve frequent exposure to chlorine-containing substances, and it is more rugged. To replace the pre-1990 filaments, see Section IV.F and connect wires as above.

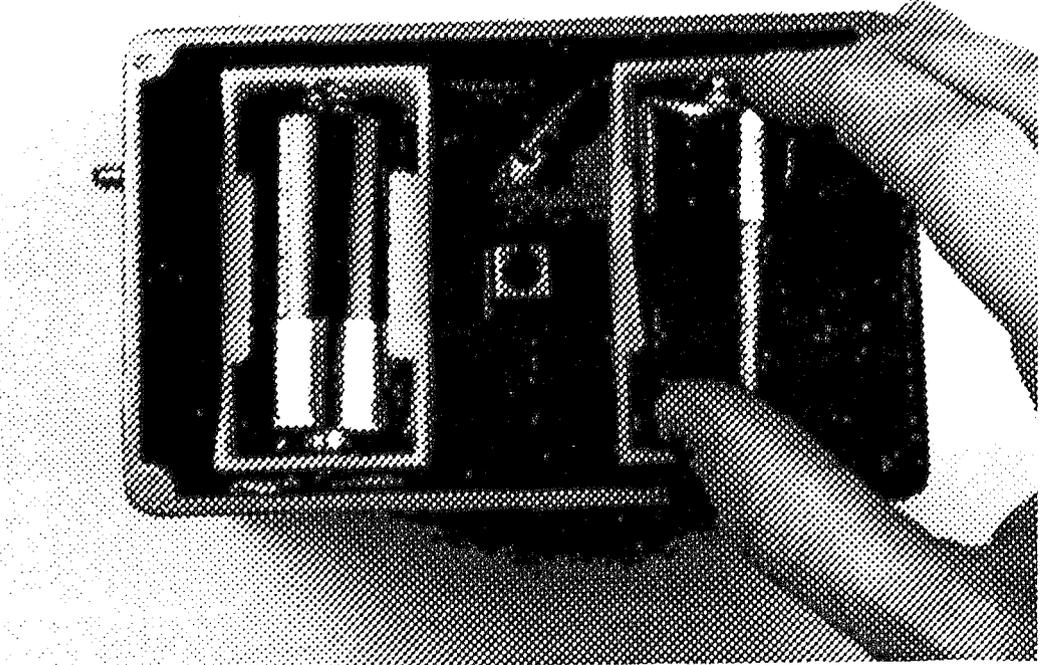
C. Batteries and Charging

The Model GP-204 is furnished with two standard size D alkaline-type dry cells or with two rechargeable nickel-cadmium batteries, at purchaser's option. The alkaline-type cells will give 4 to 5 hours of operating life and are recommended. However, ordinary carbon-zinc dry cells can also be substituted. If dry cells are used, they will be adequate for 45 minutes of continuous operation, longer on intermittent use. Nickel-cadmium batteries will last up to 4 hours and can be recharged repeatedly. When meter needle cannot be set as high as the "CHECK" line with switch in VOLT ADJ. position and VOLT ADJ. knob all the way clockwise, batteries require replacement or recharging.

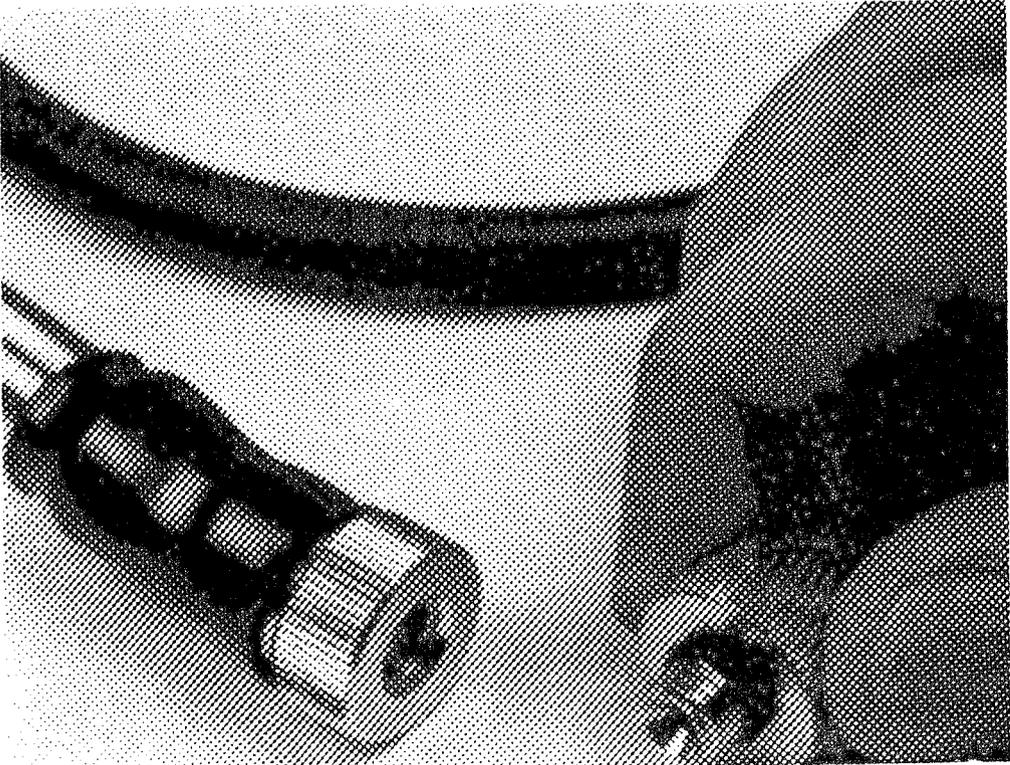
To replace batteries, remove instrument from leather case, and loosen the coin-slotted captive screw found in center of bottom plate. Remove plate, exposing batteries in their spring-contact holders. Pull old batteries out, and install new ones in the same position, observing polarity as marked on holder.

If instrument is furnished with nickel-cadmium batteries and a charger, batteries may be recharged in the instrument. Plug charger into a standard 115V AC outlet and insert connector on charger cord into socket on end of instrument. Overnight charge (16 hours) should restore batteries to full capacity without damaging them. An optional charger for use in recharging from a vehicle battery is also available.

CAUTION: DO NOT ATTEMPT TO CHARGE BATTERIES THAT ARE NON-RECHARGEABLE AS THIS CAN CAUSE EXPLOSION OF THE CELLS.



BATTERIES



HOSE FITTING WITH O-RING

D. Sample System

1. Probe

The standard probe supplied with the Model GP-204 consists of a 10" long 1/4" OD plastic tube with a dust filter chamber at the upper end, forming a handle. This filter chamber is transparent acrylic plastic, so the filter condition can readily be inspected. To replace filter, unscrew filter chamber where it connects to the nickel-plated threaded base.

Probe tube can be replaced with a new one, by unscrewing the hex packing nut. Any 1/4" OD tube of any material and any length can be used with this assembly.

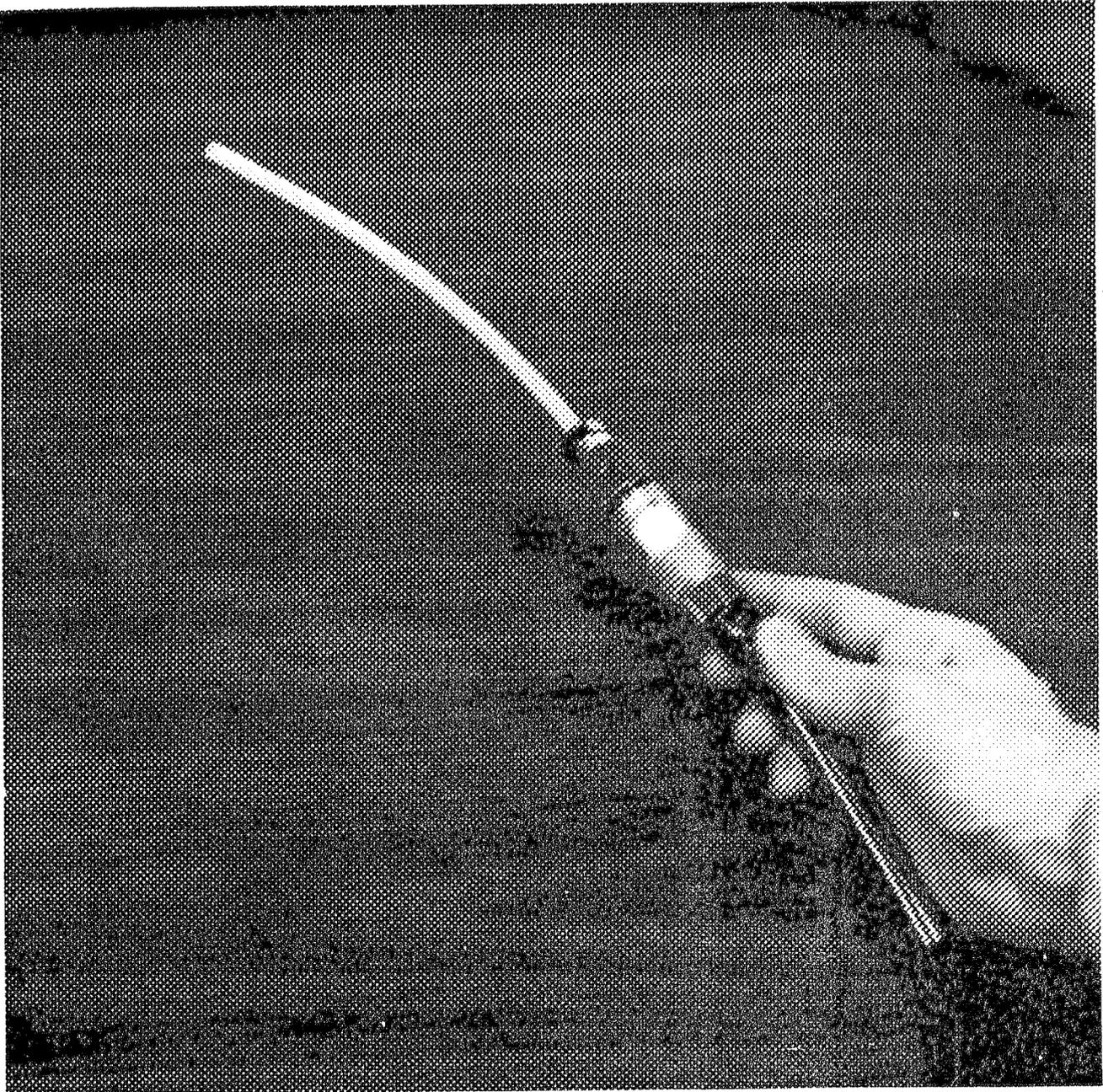
Longer probes of various materials are available from GasTech as accessories. (See Accessories, VI A)

2. Hose

The 3' and 6' hoses supplied are Teflon-lined synthetic rubber jacketed, and immune to absorption or attack by any combustible vapors or solvents. An O-ring is used to make an air-tight seal to probe. Keep hose clean and be sure that couplings make air-tight contact, checking occasionally by holding finger over hose inlet and squeezing bulb. Bulb should remain flat if there is no leak.

Extension hoses are available for sampling in deep holes and tanks. (See Accessories VI.B)

Note: Instruments supplied 1984 and later may be supplied with a hose made of polyurethane tubing, which is lightweight and solvent-resistant.



PROBE

E. Meter Lamp

The meter lamp is on whenever the instrument is on, acting as pilot light and providing illumination to permit reading meter in dark places. If lamp fails, it should be replaced as follows:

1. Remove four screws holding top plate to top panel.
2. Take off top plate, exposing lamp.
3. Loosen set screws which lock lamp wires to terminals, and pull lamp out.
4. Install new lamp in the same position.

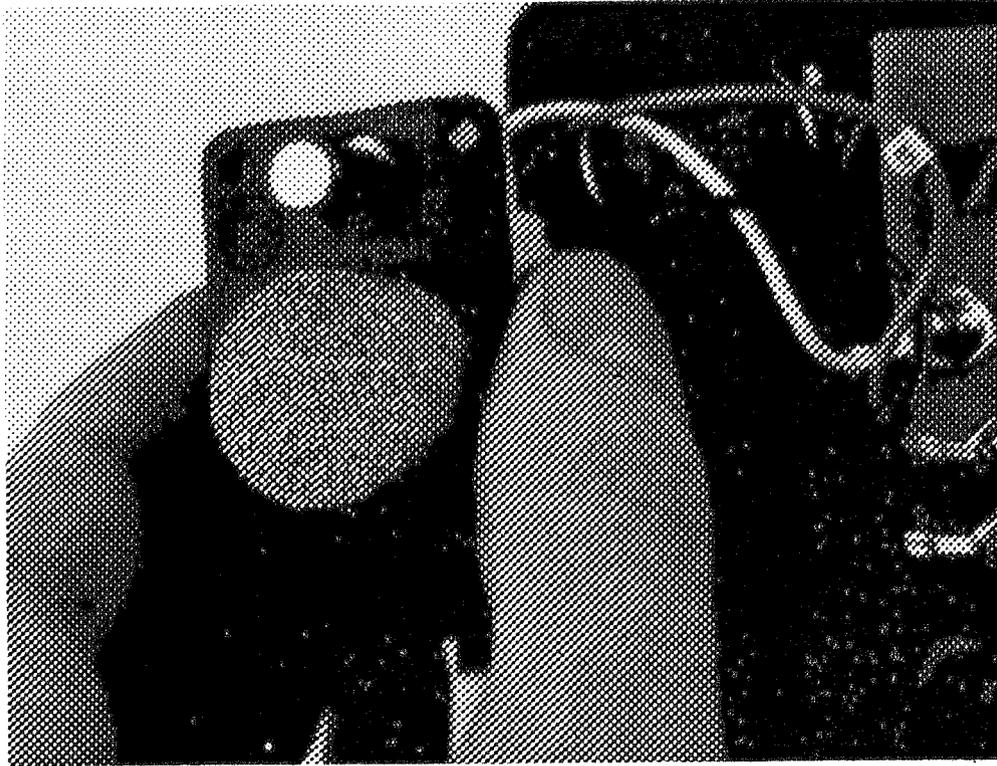
F. Filament Replacement - Pre-1990

This filament assembly is composed of three basic parts; a base plate with a flame arrestor attached, a pre-wired matched pair of filaments, and an "X" shaped filament retainer.

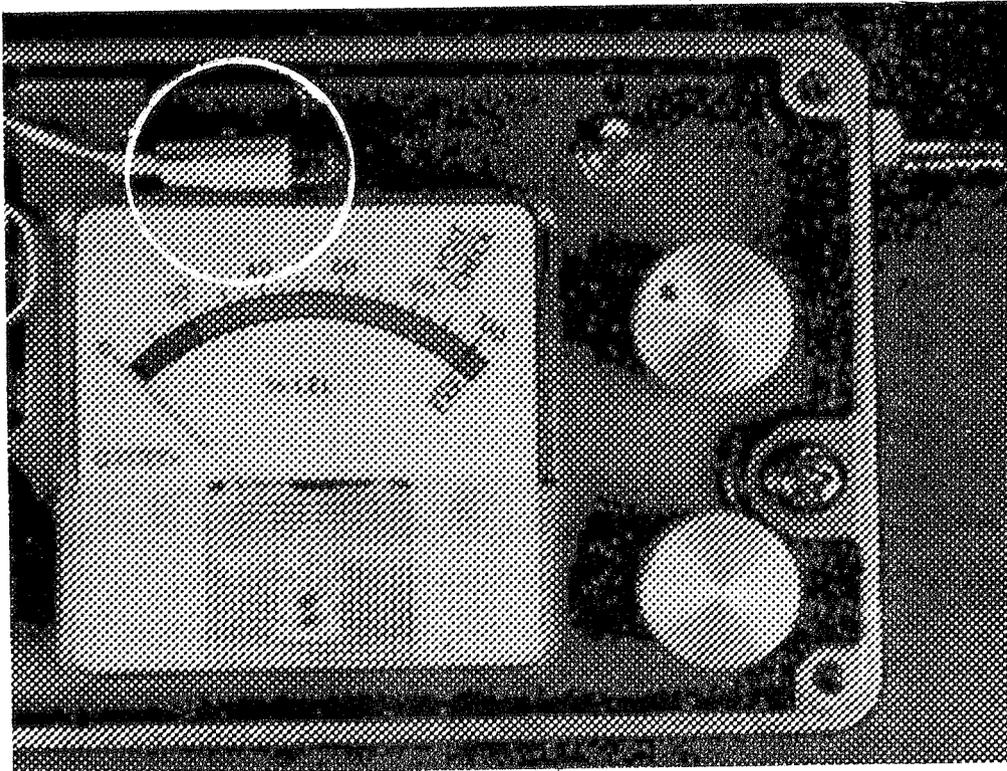
The active filament (exposed) is installed within the flame arrestor, a porous sintered bronze cup, which acts to retain explosive mixtures. The reference filament (enclosed) is located in the same atmosphere next to the active filament, outside the flame arrestor. Filaments are removed by disconnecting their wires, unscrewing the two screws in the retainer and pulling the filaments out. The flame arrestor may be removed by taking out the four screws that hold the plate in which the filaments are installed.

If flame arrestor is dusty, wet, oily or corroded, it must be washed or replaced. Preferred cleaning method is washing in detergent solution, rinsing from the inside out, and drying thoroughly in air.

Before re-installing, inspect it carefully to be sure it is firmly secured to mounting plate. Be sure that the reaction chamber cavity and incoming passages are clean and dry, and that the gasket is in good condition.



FLAME ARRESTOR, BEFORE 1990



METER LAMP

V. PRECAUTIONS AND NOTES ON OPERATION

A. Heated Samples

When sampling spaces such as hot tanks that are warmer than the instrument, remember that condensation can occur as the sample passes through the cool sample line. Water vapor condensed in this way can block the flow system and corrode the flame arrestor. A water trap can be used to control this, and is available as an accessory.

If heated hydrocarbon vapors of the heavier hydrocarbons (flash point 90°F or above) are present, they may also condense in the sample line and fail to reach the filament. Thus an erroneous low reading may be obtained. Special techniques are required to handle such samples, and consultation with engineers at GasTech is advised.

B. Filament Poisoning

Certain substances have the property of desensitizing the catalytic surface of the platinum filament. These substances are termed "catalyst poisons" and can result in reduced sensitivity or in failure to give a reading on samples containing combustible gas. The most commonly encountered catalyst poisons are the silicone vapors. Samples containing such vapors even in small proportions, should be avoided.

Occasional calibration checks on known gas samples are necessary, especially if the possibility exists of exposure to silicones. A calibration check on a known natural gas mixture is the most dependable as an indication of normal sensitivity. A convenient calibration kit is available and described under "Accessories".

Recurrent loss of sensitivity can be reduced by use of the No. 62-0110 heavy-duty filament assembly.

C. Rich Mixtures

When high concentrations of gas are sampled, especially those above the LEL, considerable heat is liberated at the filament. This heat may cause damage to the filament or tend to shorten its life, so sustained testing of samples beyond the meter range should be avoided.

When sampling rich mixtures, the following instrument action may be expected:

1. Mixtures up to 100% LEL -- reading on scale.
2. Mixture between LEL and Upper Explosive Limit (UEL) -- readings at top of meter.
3. Mixtures above UEL -- As sampling continues, the meter first goes to top of scale, then comes back down on scale or below, depending upon concentration. Very rich mixtures will give a zero or negative reading.

If the No. 62-0110 heavy-duty filament/flame arrestor assembly is in use, the reading will remain at top scale even at very rich mixtures, and will only drop at or close to the point where only combustible gas (no air) is present. The 62-0110 assembly is compensated so the reading can never go below zero because of high concentrations.

D. Oxygen Deficient Mixtures

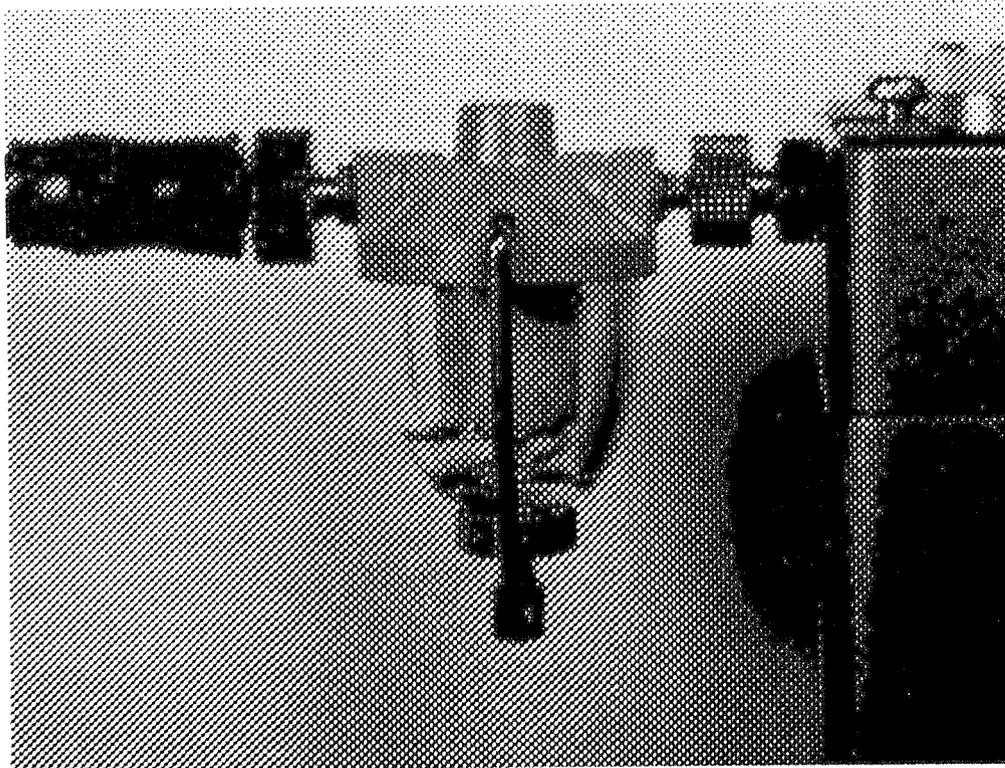
Samples which do not have the normal proportion of oxygen may tend to read low, if there is not enough oxygen to react with all combustible gas present in the sample. As a general rule, samples containing 10% oxygen or more have enough to give full reading on any combustible gas sample up to the LEL.

E. Oxygen Enriched Mixtures

Samples having more than normal proportion of oxygen will give a normal reading. However, they should be avoided because the flame arrestor used is not dense enough to arrest flames from combustible gas in oxygen, which can be much more intense than those in air.

DO NOT ATTEMPT TO USE THE MODEL GP-204 ON SAMPLES OF COMBUSTIBLE GAS IN OXYGEN.

Instruments for measurement of oxygen concentration are available from GasTech, Inc.



MOISTURE TRAP

V I. ACCESSORIES

A. Probe

The standard 10" probe is convenient for general purpose use in checking for leaks and probing through tank openings, manhole covers and access ports. For frequent tests at ground level in manholes and in tanks, a 30" aluminum probe is available. Probe is cross-drilled 4" from the end, so that water will not be drawn into instrument even if end of probe is inadvertently immersed. Same filter arrangement is provided in handle of probe as with 10" probe. Order Stock No. 80-0155.

Similar probe of 30" length, but made of light-weight non-conductive fiberglass, is available as Stock No. 80-0156.

B. Extension Hoses

Additional lengths of hose may be used, up to approximately 50', for sampling from deep tanks and manholes. The polyethylene-lined hoses (80-0015 and 80-0025, see Parts List) are satisfactory for most samples including natural gas, hydrogen, propane, and gasoline vapors.

Some of the more complex hydrocarbons, such as xylene and styrene, tend to be adsorbed on the walls of the polyethylene hose. For these samples, consult factory for most appropriate hose selection.

C. Moisture Trap

Where there is danger of water being drawn into instrument, a moisture trap should be used. This glass-bodied trap with sintered metal filter couples to indicator inlet and will collect water that is drawn into or condensed in sample hose. Inspect trap periodically while in use, and empty or clean bowl and filter whenever visible water or dust accumulate. Regular sample hoses connect to inlet of trap when it is installed on instrument. Order Stock No. 80-0200.

D. Calibration Test Kit

Dependable results from any gas indicator are best assured by periodic tests for response. The Calibration Test Kit provides a convenient means for making such tests. Included in the kit are two cylinders of a known compressed gas-air mixture, cylinder dispensing valve, two sections of tubing, (one with a threaded swivel fitting) and a collecting bag with a "Y" tubing fitting and pinch clamp, all stored in a carrying case. Gas cylinders are filled with a mixture of 2.5% natural gas in air, which should produce a reading of 55% LEL on the indicator scale.

Natural gas (primarily methane) is used because this is the most critical material for catalytic activity on a platinum filament. If the instrument gives a normal response on natural gas, it will also give a normal response to all other combustible gases and vapors.

Cylinders containing other gas mixtures are available for use with the Model GP-204. Of particular interest are the #81-0007 hexane-air mixture, representative of gasoline and petroleum vapors, and #81-0002 hydrogen-air mixture, where hydrogen is the gas of primary concern.

To attach Calibration Kit to instrument:

1. Check dispensing valve to make sure flow control knob is shut off (clockwise).
2. Remove protective red plastic cap from cylinder and screw dispensing valve into cylinder. Retain protective cap.
3. Attach tube with swivel fitting to instrument and "Y" fitting on collection bag.



CALIBRATION TEST KIT

4. Attach other section of tubing between dispensing valve and "Y" fitting.

To make a response test or to calibrate, see Section IV.A., Calibration and Adjustment.

E. Hydrophobic Filter

Where the primary concern is that water might be drawn into instrument, a "hydrophobic filter" is now available, which has a porous fluorocarbon filter element that is not wetted by water and hence will not allow liquid to pass through. It couples to instrument inlet fitting and will block any water that is drawn through hose. Order Stock No. 80-0221.

VII. PARTS AND ACCESSORIES LIST

The following items are considered as normal repair or replacement parts or accessories and may be ordered separately by description and stock number. Always specify Model GP-204 and the serial number when ordering. For information on parts not listed below, for instructions on returning instrument for repair or for problems not covered in this Instruction Manual, write or phone GasTech, Inc.

Stock No	Description
33-1031	Cotton dust filter, pkg of 24
35-0649	Flame arrestor gasket
35-0650	Flame arrestor plate assembly
49-1501	Battery, nickel-cadmium, Size D, (2 used)
49-2011	Charger for GP-204, 115V AC
62-0100	Filaments, pair, active and reference
62-0110	Filaments/flame arrestor assembly, heavy-duty type
71-0061	Instruction Manual, Model GP-204
80-0001	Hose, 3', complete with coupling
80-0002	Hose, 6', complete with coupling
80-0015	Hose, 15', complete with coupling
80-0025	Hose, 25', complete with coupling
80-0150	Probe with filter, 10" plastic
80-0155	Probe with filter, 30" aluminum
80-0156	Probe with filter, 30" fiberglass
80-0200	Moisture Trap, attachment
80-0221	Filter, hydrophobic
81-0002	Cylinder, 2% Hydrogen
81-0007	Cylinder, 40% LEL hexane
81-0012	Cylinder, replacement, Test Kit, 2.5% natural gas
81-0202	Calibration Test Kit, 2.5% natural gas

NOTES:

STANDARD WARRANTY

GAS DETECTION INSTRUMENTS

We warrant gas alarm equipment manufactured and sold by us to be free from defects in materials, workmanship and performance for a period of one year from date of shipment from Gas Tech Inc. Any parts found defective within that period will be repaired or replaced, at our option, free of charge, f.o.b. factory. This warranty does not apply to those items which by their nature are subject to deterioration or consumption in normal service, and which must be cleaned, repaired or replaced on a routine basis. Such items may include:

- a) Lamp bulbs and fuses
- b) Pump diaphragms and valves
- c) Absorbent cartridges
- d) Filter elements
- e) Batteries
- f) Most catalytic and electrochemical sensors are covered by a separate warranty of 12 or 24 months.

Warranty is voided by abuse including rough handling, mechanical damage, and alteration or repair procedures not in accordance with instruction manual. This warranty indicates the full extent of our liability, and we are not responsible for removal or replacement costs, local repair costs, transportation costs, or contingent expenses incurred without our prior approval.

Gas Tech Inc.'s obligation under this warranty shall be limited to repairing or replacing, and returning any product which Gas Tech Inc. Material Review Board examination shall disclose to its satisfaction to have been defective. To receive warranty consideration, all products must be returned to Gas Tech Inc. at its manufacturing facilities with transportation charges prepaid.

This warranty is expressly in lieu of any and all other warranties and representations, expressed or implied, and all other obligations or liabilities on the part of Gas Tech Inc. including but not limited to, the warranty of fitness for a particular purpose. In no event shall Gas Tech Inc. be liable for direct, incidental or consequential loss or damage of any kind connected with the use of its products or failure of its product to function or operate properly.

This warranty covers instruments and parts sold (to users) only by authorized distributors, dealers and representatives as appointed by Gas Tech Inc.

Sls/Eng Rev. 1/90

SERVICE POLICY

Gas Tech Inc. maintains an instrument service facility at the factory. Some Gas Tech distributors also have repair facilities; however, **Gas Tech assumes no liability for service performed by other than Gas Tech personnel.** Should your instrument require non-warranty repair, you may contact the distributor from which it was purchased, or you may contact Gas Tech directly.

If Gas Tech is to do the repair work for you, you may send the instrument, prepaid to Gas Tech Inc. 8445 Central Avenue, Newark, CA 94560, Attn: Service Department. Always include your address, purchase order number, shipping and billing information and a description of the defect as you perceive it. If you wish to set a limit to the authorized repair cost, state a "not to exceed" figure. If you must have a price quotation before you can authorize the repair cost, so state, but understand that this involves extra cost and extra handling delay. Gas Tech's policy is to perform all needed repairs to restore the instrument to full operating condition, including reactivation of all out-of-warranty electrochemical cells.

To expedite the repairs operation, it is preferable to call in advance to Gas Tech Instrument Service, (510) 794-7015, obtain a Return Authorization Number (RA#), describe the nature of the problem and provide a purchase order number.

If this is the first time you are dealing directly with the factory, you will be asked to provide credit references or prepay, or authorize COD shipment.

Pack the instrument and all its accessories (preferably in its original packing). Enclose your Purchase Order, shipping and billing information, RA#, and any special instructions.