Procedure: Field Analysis of Unidentified Potentially Hazardous Materials

Purpose:

A systematic process must be used for material analysis during incidents involving un-identified and potentially hazardous materials. The purpose of this policy is to establish the procedures that shall be used for the general analysis of identified materials regardless of the source or threat.

This policy does not address the specific procedures to be used for a particular analysis method. Individual operational manuals or guidelines shall address those procedures.

Applicability:

It is the Incident Commander's responsibility to insure that this policy is fully implemented at emergencies involving potentially hazardous materials that must be identified. It is the responsibility of all hazardous materials team members to be able to carryout the procedures outlined in this policy. Some advanced procedures may require specially trained individuals (e.g., IR Spectrometry, MS/GC)

Minimum Analysis Procedures:

At a minimum, all unidentified potentially hazardous materials shall be assessed for the following characteristics and all hazardous materials team members shall be capable of performing these procedures.

- **Radioactivity:** With radiation survey meter, determine if the material presents ionizing radiation greater than identified background levels.
- **Corrosives:** At the same time, assess the material for corrosive vapors by using a pH strip moistened with distilled water. Then touch any the product with the pH paper to determine if the material has corrosive characteristics.
- **Oxygen Concentration and Flammability:** If the material is a gas, liquid or potentially sublimating solid, then oxygen concentration should be check in low-lying or enclosed areas and the ability to detect combustible/flammable vapors should be assessed.
- **PID/FID:** If the material is a gas, liquid or potentially sublimating solid then a total vapor analysis shall be performed using Photo-ionization Detector (PID) or combination Photo-ionization Detector/ Flame Ionization Detector (PID/FID). This will aid in identifying organic or inorganic nature of the material as well as provide quantitative analysis of concentration once the true identity of the materials is determined.

The decision flow chart found within this Standard Operating Procedure can be used as a standardized guide to the analysis process. The flow chart, combined with visible on-scene observations and other incident factors, shall be used as a guide in determining the necessary level of analysis beyond those minimum procedures identified above.

Additional Analysis Procedures:

Depending upon potential risks or need to determine the material's actual identity, the following additional measures may be selected to provide further field analysis.

For vapors, gases and high vapor pressure liquids:

- Gas Infrared Spectrometry using the Thermo Miran-Sapphire® or MS/GC
- Colorimetric detector tube (Drager) qualitative analysis procedures
- APD 2000 for potential chemical warfare agents or pepper spray
- Haz-Mat Chemical Agent Detector (CAD) for chemical warfare agents
- Consider obtaining 10mL liquid sample or 20 liter gas sample in a clean, un-used container for lab or support zone analysis

For solids and low vapor pressure liquids:

- M8 – M9 Chemical warfare agent detector paper
- M256A1 Chemical warfare agent wet chemistry detection kit
- Consider field biological agent immunoassay for substances with significant creditability or risk.
- Solid or liquid Infrared Spectrometry using the Travel IR® or MS/GC of head space vapors
- Haz-Cat® wet chemistry qualitative analysis.
- Consider obtaining 10mL liquid or solid sample in a clean, unused sample container for lab or support zone analysis.

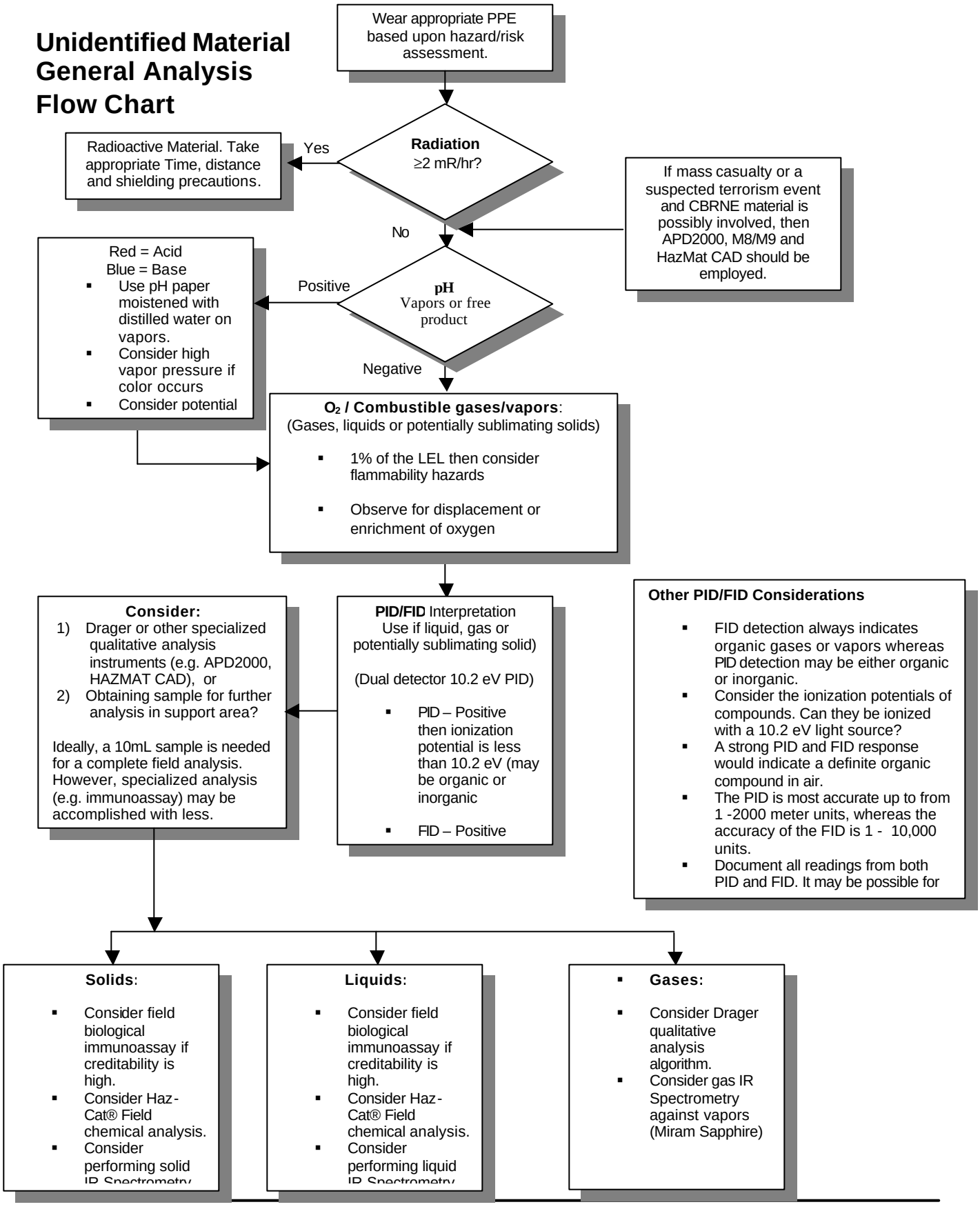
Documentation of Analysis

The attached “Detection and Analysis Worksheet” shall be used to develop and document the air monitoring strategy. In addition, the “Findings” section of the form can be adapted and utilized to document field screen activities. If this form is used during an incident, it shall become a part of the permanents and final incident report.

At a minimum, all analysis procedures used shall be noted in the “Hazard/Risk Assessment” narrative of the hazardous materials incident report.

If the analysis is conducted in conjunction with a law enforcement investigation (e.g. suspicious powder incident or other criminal investigation) then all appropriate chain of custody, sample submission forms and sample container labels will be completed as per appropriate SOP or Directives.

Unidentified Material General Analysis Flow Chart



Detection and Analysis Worksheet

INCIDENT # _____ DATE: ____/____/____TIME: _____

ANTICIPATED HAZARDS

Flammability	[ ]	Oxygen Deficient	[ ]	Oxygen Enriched	[ ]
Corrosive	[ ]	Radiation	[ ]	Toxic	[ ]

INSTRUMENT	FREQUENCY	ACTION LEVEL	ACTION	REL. RESP	ACCESSORIES
Corrosivity					
Radioactivity					
Flammability					
Oxygen Concen.					
Other					
Other					
Other					
Other					

FINDINGS

TIME	LOCATION/METHOD	REMARKS	FINDINGS