

WEAPONS OF MASS DESTRUCTION
Response and Investigation

ABOUT THE AUTHORS

Steven C. Drielak received his bachelor's and master's degrees from John Jay College of Criminal Justice in New York City. As a Senior Investigator with the New York County District Attorney's Office from 1975 to 1978, he investigated cases involving corruption and racketeering. In 1978, he joined the staff of the Suffolk County District Attorney's office. He was assigned to the newly-created Environmental Crime Unit in May of 1984 and has commanded the unit since 1992. During his tenure with this unit, he has collected chemical, biological, and radiological evidence at over 500 crime scenes. Detective Lieutenant Drielak is also a certified instructor for the Criminal Investigations Division of the U.S. Environmental Protection Agency and has been awarded the National Trainer of the Year by the US Environmental Protection Agency's National Enforcement Training Institute. His recent book *Environmental Crime: Evidence Gathering and Investigative Techniques*, has been chosen by the US EPA as the Academy textbook for all incoming Special Agents.

Thomas R. Brandon received his bachelor's degree from St. John's University and juris doctorate from the St. John's University School of Law in New York City. He is admitted to practice law in the state of New York. His law enforcement career with the Suffolk County, New York, Police Department began in 1981 and has included assignments in Patrol, Planning and Research, Legal Bureau, and the Emergency Service Section. He has commanded the Emergency Service Section as a lieutenant since 1992 and has responded to numerous critical incidents involving hazardous materials, explosives, barricaded subjects, and other disasters and special operations. Lieutenant Brandon is a graduate of the US Army/FBI Hazardous Devices School at Redstone Arsenal and a member of the National Bomb Squad Commanders Advisory Board. He is a graduate of the FBI National Academy as well as numerous specialized training courses related to hazardous materials, explosives, special weapons and tactics, and technical rescue. Lieutenant Brandon has received several awards from the Suffolk County Police Department as well as other organizations. He has been a firefighter since 1977 and has served as an instructor for various topics including hazardous materials response and incident command.

WEAPONS OF MASS DESTRUCTION

Response and Investigation

By

STEVEN C. DRIELAK

and

THOMAS R. BRANDON



Charles C Thomas
P U B L I S H E R • L T D.
SPRINGFIELD • ILLINOIS • U.S.A.

Published and Distributed Throughout the World by

CHARLES C THOMAS • PUBLISHER, LTD.
2600 South First Street
Springfield, Illinois 62704

This book is protected by copyright. No part of
it may be reproduced in any manner without
written permission from the publisher.

© 2000 by CHARLES C THOMAS • PUBLISHER, LTD.

ISBN 0-398-07091-1 (cloth)
ISBN 0-398-07092-X (paper)

Library of Congress Catalog Card Number: 00-032613

With THOMAS BOOKS careful attention is given to all details of manufacturing and design. It is the Publisher's desire to present books that are satisfactory as to their physical qualities and artistic possibilities and appropriate for their particular use. THOMAS BOOKS will be true to those laws of quality that assure a good name and good will.

Printed in the United States of America
MR-R-3

Library of Congress Cataloging-in-Publication Data

Drielak, Steven C.

Weapons of mass destruction : response and investigation / by Steven C.
Drielak and Thomas R. Brandon.

p. cm.

Includes index.

ISBN 0-398-07091-1 (cloth) – ISBN 0-398-07092-X (pbk.)

1. Offenses against the environment—United States. 2. Criminal investigation—United States. 3. Bombing investigation—United States. 4. Chemical weapons—United States. 5. Biological weapons—United States. I. Brandon, Thomas R. II. Title.

HV 6403 .D77 2000
363.25—dc21

00-032613

*This book is dedicated to our families.
If it were not for their patience and understanding,
this manuscript would not have been possible.*

PREFACE

Law enforcement has faced many new challenges over the years. Today it finds itself preparing for the unthinkable: the intentional release of a chemical, biological, or radiological substance that may kill or seriously injure innocent civilians on a massive scale. In order to meet this challenge, the law enforcement community must provide its officers with the necessary training, procedures, and equipment to safely respond to such an incident *before* the incident actually occurs.

Law enforcement personnel will undoubtedly be among the first responders to an incident involving the use or threatened use of a weapon involving chemical, biological, radiological, explosive, or incendiary materials. The initial actions that they undertake will have a significant effect on the overall outcome of the incident, including the safety of the public, as well as the responders themselves. Law enforcement must assess the threat within their jurisdiction and begin the process of planning for a WMD event. This should include a determination as to what training will be necessary, what equipment may be required, and what response procedures need to be put in place to insure a safe and efficient response.

Because of the potential magnitude and complexity of a WMD incident, law enforcement must be prepared to work side by side with other agencies and disciplines. These may include the fire and emergency medical service communities, as well as other law enforcement agencies from various levels and jurisdictions. A task such as this will require the use of an effective incident management system involving all of the response agencies working together toward a common objective.

A safe and effective emergency response is just one of the challenges facing law enforcement today. The use or threatened use of a weapon of mass destruction is a *crime* and proper police procedures must be established to safely and effectively gather evidence at a crime scene such as this.

The gathering of chemical, biological, and radiological evidence is not a

new science. Verification experts from the Chemical and Biological Weapons Treaty organizations have many established WMD sampling and analytical protocols which may be utilized by law enforcement. The U.S. Department of Energy has also established numerous sampling and analytical protocols for radiological substances. In addition, the criminal environmental enforcement community has developed many safe and legally sufficient procedures for the gathering of chemical, biological, and radiological evidence in a declared hot zone. This book has combined these various scientific and investigative disciplines and in doing so has provided detailed procedures for the gathering of chemical, biological and radiological evidence regardless of its form or matrix. When facing this new challenge, investigative law enforcement personnel must accept the realization that a WMD crime scene is no different from any other type of crime scene *with the exception that the evidence you gather may kill you.*

STEVEN C. DRIELAK
THOMAS R. BRANDON

ACKNOWLEDGEMENTS

We would like to thank Kenneth Hill, Director of the Suffolk County Environmental and Health Laboratory, and microbiologist Mike Santerrelo for the gracious assistance in preparing this book. We would also like to thank Steve Centore of the U.S. Department of Energy's Radiological Assistance Program for his time and patience.

CONTENTS

	<i>Page</i>
<i>Preface</i>	vii
 <i>Chapter</i>	
1. THE THREAT	3
Where	4
Potential Targets	5
How	6
Methods of Delivery/Attack	6
Availability of Materials and Information	9
Who	10
 2. AWARENESS	 11
Chemical Agents	11
Nerve Agents	12
Blister Agents	12
Blood Agents	12
Choking Agents	13
Incapacitating Agents	13
Biological Agents	13
Toxins	14
Bacteria	14
Rickettsia	14
Viruses	14
Recognition of an Incident	14
Start the Investigation at the First “Positive” Indication	15
Signs and Symptoms	17
Recognition of Materials	21
Recognition of Devices	26

3.	FIRST RESPONDER ACTIONS	28
	Recognition	28
	Notification	29
	Putting the “Plan” in to Action	29
	Scene Security	29
	Who Will Be Allowed in What Areas	34
	Document Personnel at the Scene	34
4.	PERSONAL PROTECTION	36
	Protective Actions	37
	Routes of Entry	37
	Respiratory Protection	38
	Air-Purifying Respirator	38
	Self-Contained Breathing Apparatus	39
	Supplied-Air Respirator	40
	Chemical Protective Clothing	40
	Level A	42
	Level B	42
	Level C	42
	Level D	43
5.	LAW ENFORCEMENT RESPONSE	44
	Scene Assessment	44
	Secure the Site	48
	Limiting the Spread of the Hazard	48
	Begin Aiding the Injured	49
	Initiate the Criminal Investigation	49
	Assist Other Agencies in Performing Their Duties	50
	The Restoring of Order and Public Confidence	51
6.	HANDLING THE VICTIMS	52
	Aiding the Injured	52
	Gross Decontamination	54
	Secondary Contamination	55
7.	INCIDENT MANAGEMENT	57
	Incident Command System Components	58
	Common Terminology	58
	Modular Organization	59
	Integrated Communications	59
	Unified Command	60

Consolidated Action Plans . . . . .	.61
Manageable Span of Control . . . . .	.61
Designated Incident Facilities . . . . .	.62
Comprehensive Resource Management . . . . .	.63
Functional Roles . . . . .	.63
Incident Commander . . . . .	.63
Operations . . . . .	.64
Planning . . . . .	.65
Logistics . . . . .	.66
Finance . . . . .	.67
Command Staff . . . . .	.68
Safety Officer . . . . .	.68
Liaison Officer . . . . .	.68
Information Officer . . . . .	.68
The Command Post . . . . .	.69
 8. SOURCES OF ASSISTANCE . . . . .	.71
Federal Bureau of Investigation (FBI) . . . . .	.71
Federal Emergency Management Agency (FEMA) . . . . .	.71
Department of Health and Human Services (DHHS) . . . . .	.72
U.S. Environmental Protection Agency (EPA) . . . . .	.72
U.S. Department of Energy (DOE) . . . . .	.72
Department of Defense (DOD) . . . . .	.73
 9. TACTICAL OPERATIONS IN A HOT ZONE . . . . .	.74
Equipment . . . . .	.76
Weapons . . . . .	.78
Training . . . . .	.78
 10. PLANNING CONSIDERATIONS . . . . .	.80
LEPC Plan . . . . .	.81
Vulnerability Assessment . . . . .	.82
Existing Capabilities . . . . .	.83
Determining Your Equipment Needs . . . . .	.84
Equipment . . . . .	.84
Response Equipment . . . . .	.85
Investigative Equipment . . . . .	.85
Specialized Equipment . . . . .	.86
Investigation Plans . . . . .	.87
The Investigation Team . . . . .	.87
Who Will Gather the Evidence . . . . .	.88

Inter-Agency Planning	.88
Training Considerations	.89
Who Will Be Trained	.90
Joint Investigative and Response Personnel Training	.90
Available Resources	.91
Making the Training Practical	.91
Refresher Training	.92
11. POST-INCIDENT OPERATIONS	.93
Critique	.93
Re-Assessing Training Needs	.94
Re-Assessing Equipment Needs	.94
Re-Assessing Plans and Procedures	.95
Post-Incident Stress Debriefing	.95
Medical Screening and Surveillance	.96
12. PREPARING FOR THE CRIMINAL INVESTIGATION	.97
Personnel Training	.98
Occupational Safety and Health Administration	.98
Emergency Response to Hazardous Substance Release	.98
Respiratory Protection	.99
Recognition, Evaluation and Control	
of Ionizing Radiation	.99
Confined Space Entry	.99
Industrial Toxicology	.99
Biohazard	.99
United States Environmental Protection Agency	.99
Advanced Environmental Crimes Training Program	.99
Sampling for Hazardous Materials	.100
Air Monitoring for Hazardous Materials	.100
Hazardous Materials Incident Response Operations	.101
Emergency Response to Hazardous Material Incidents	.101
Radiation Safety at Superfund Sites	.102
The Equipment	.102
Standard Operating Procedures	.103
13. THE CRIME SCENE	.104
Arrival Procedures	.104
Photography and Videotape	.105
Crime Scene Interviews	.106
Victims' Personal Effects	.106

14.	THE INVESTIGATIVE TEAM	107
	Crime Scene Coordinator	108
	The Safety Officer	108
	The Safety Team	108
	Decontamination Team	109
	Emergency Medical Assistance	109
	The Sample Team	109
	The Laboratory Team	109
	Hot Zone Investigation Team	110
15.	GATHERING EVIDENCE IN A HOT ZONE	111
	Equipment and Procedures	111
	The Crime Scene Notes	115
16.	SAMPLING FOR CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL EVIDENCE	118
	The Sampling Plan	119
	Chemical Evidence	119
	Chemical Evidence Gathering	119
	Trip Blanks	120
	Field Blanks	120
	Glove Changes	122
	Representative Samples	122
	Control Samples	122
	Sampling Equipment and Containers	
	for Chemical Evidence	122
	Sampling for Chemical Agent Precursors	125
	Sampling for a Suspected Chemical Agent	126
	Liquids and Solids	126
	Victims'/Suspects' Personal Items	126
	Gases/Aerosols	127
	Surface and Dermal Sampling	128
	Sampling for Degradation Products	132
	Chemical Evidence Quality Control	132
	Labeling and Preserving Chemical Evidence	133
	Storage of the Chemical Evidence	135
	Biological Evidence	135
	Biological Evidence Gathering: <i>Bacteria, Viruses and Toxins</i>	137
	Equipment Preparation	137
	Glove Changes	138
	Control Samples	138

Sampling for a Suspected Biological Agent	138
Liquids and Solids	139
Victims'/Suspects' Personal Items	140
Soils	140
Surface and Dermal	140
Bioaerosols	141
Labeling and Preserving Biological Evidence	145
Biological Evidence Storage	146
Radiological Evidence	146
Radiological Evidence Gathering	146
Trip Blanks	147
Glove Changes	147
Control Samples	147
Sampling Equipment and Containers for Radiological Evidence	147
Sampling for a Suspected Radiological Substance	148
Airborne Radioactive Material	149
Solid Sources	149
Soils	151
Surface and Dermal	153
Liquids	154
Radiological Evidence Preservation and Storage	155
Packaging and Shipping of Hazardous Evidence	156
17. ANALYSIS FOR CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL EVIDENCE	161
Hazardous Evidence Analysis: <i>Instrumentation</i> and <i>Methodologies</i>	162
Chemical Evidence Analysis	162
Gas Chromatography/Mass Spectrometry	162
Biological Evidence Analysis	163
Growth Culture Analysis	164
Immunoassay	165
Deoxyribonucleic Acid/Polymerase Chain Reaction – DNA/PCR	165
Radiological Evidence Analysis	166
The Laboratory: <i>Post Analysis</i>	166
18. INTERDICTION TECHNIQUES	167
Chemical Agents: <i>Manufacturing</i>	167
Precursor Container Tracing	168

Biological Agents: <i>Manufacturing</i>	173
Radiological Devices: <i>Manufacturing</i>	174
Surreptitious Sampling Techniques	176
Remote Air Sampling	176
Remote Liquid Waste Stream Sampling	177
Raman Light Detection and Ranging (Raman LIDAR)	178
 19. SEARCHING THE SUSPECT FACILITY	179
Determining Goals	179
Equipment Requirements	180
Personnel Requirements	181
The Search Team	181
The Briefing	182
Chain-of-Command	182
Safety Officer	182
Site Investigation Team	183
The Sample Team	183
Type of Facility	183
Suspected Hazards	184
Expected Protection Levels	184
Decontamination Requirements	184
Emergency Medical Requirements	184
The Sampling Operation	184
Site History	185
Photographs	185
Facility Diagram	185
Weather	185
Communications	186
Search Warrant Review	186
The Staging Area	186
Personnel and Equipment Check	186
Operation's Plan Overview	186
The Search	187
Interior Search	187
Exterior Search	191
Post-Search Briefing	192
Sample Point Identification	193
The Sampling Order	193
Chain-of-Custody	194
Pipe Tracing	194
The Prosecutor	195

The Receipt	195
Closing the Scene	195
<i>Appendices</i>	197
<i>Notes</i>	207
<i>Glossary</i>	213
<i>Index</i>	219

WEAPONS OF MASS DESTRUCTION
Response and Investigation

Chapter 1

THE THREAT

Regardless of the area covered by a law enforcement agency, it must be prepared for a terrorist event to occur within its jurisdiction. There was little shock in the law enforcement community in 1993 when international terrorists attacked the World Trade Center in New York City. Officials felt that the inevitable had finally occurred in the United States.

It was a different story, however, in 1995, when the United States and the world witnessed the bombing of a federal office building in Oklahoma City, the “heartland” of America. This event showed that no one, not even children in a day-care center, is immune from the effects of terrorism. Whether international or domestic terrorism, all jurisdictions are subject to terrorist acts.

The traditional weapons of terrorism have included explosives, incendiary devices, hostage taking, kidnapping, and other obvious assaults designed to in some way enhance the terrorists’ goals. Today’s threat includes the potential use of weapons that are chemical, biological, or nuclear in nature. For an assortment of reasons, these new threats are also referred to as weapons of mass destruction (WMD) and are likely to

become the choice of terrorists in the near future.

The acronym “B-NICE” is often used to describe the weapons that may be employed by today’s criminals. This stands for **B**iological, **N**uclear, **I**ncendiary, **C**hemical, and **E**xplosives. Of these weapons, the use of explosives and incendiary devices still remains the most commonly seen by law enforcement.¹ One of the dangers that exists is that a terrorist may elect to add to the damage and injury caused by a traditional improvised explosive device by adding a biological, chemical, or radiological element to it. This has created significant new challenges for law enforcement officials in both the response to and investigation of these incidents.

Chemical and biological weapons are relatively easy to manufacture in relatively small quantities. Due to today’s information explosion where anyone with a home computer and a telephone connection can have access to a world of knowledge, the formulas for WMD are readily available. In many cases, they can be manufactured with limited risk to the manufacturer, unlike traditional improvised explosive devices which frequently took their toll on the bomb

maker.

The actual materials needed to create these weapons are also readily available in a variety of places. While some more exotic materials may need to be obtained from laboratories and scientific suppliers, the typical household can yield many of the materials needed. Chemicals found in the typical garage or basement can be the basis for the creation of a WMD. Nature itself can be the source of the pathogens needed for the creation of a biological weapon.

Chemical and biological weapons have been referred to as the “poor man’s” choice for terrorism. Because of their being readily available in everyday commerce, the materials to create an effective WMD make it a relatively low cost way to commit an act of terrorism. In many cases, only a small quantity of a chemical or biological agent is needed to achieve the desired effect. This makes them a relatively inexpensive tool; a large cash supply is not necessary to create a biological weapon that can affect an entire community.

Presently, it is difficult to detect the presence of many of the materials that may be utilized in a WMD. Unlike explosives, for which there are now an assortment of detection devices ranging from specially trained dogs to ion detection devices, the chemical and biological elements that may

be used in a weapon are not yet capable of being readily identified. As will be discussed later with regard to responding to a WMD incident, the identification of WMD materials is still in its developmental stage.

As a result of the difficulty in detecting WMD materials, they may be used rather covertly. This creates a host of problems for law enforcement personnel in both preventing a WMD incident and in becoming aware of and responding to a WMD event. A biological weapon could be introduced today, yet its effects may not be realized for hours or even days.

Depending on the objective of the particular terrorist, a WMD may be used to injure a large number of people in a single event. They are well suited to wide spread dissemination via ordinary airflow by either natural means or mechanical ventilation systems. This may result in a large number of casualties that will in turn put a significant burden on the local emergency response system in its attempt to handle the incident. There are very few agencies, whether law enforcement, fire, or EMS that will be able to handle a WMD incident without requesting assistance from other agencies and levels of government beyond their own. The importance of pre-incident planning will be discussed later in order to prepare for a WMD incident (see Chapter 10).

WHERE

Realistically, there is almost no limit to where a WMD incident may occur. Historically, we have seen terrorist acts committed against individuals, organizations, governments, facilities, and a variety of objectives that a terrorist thought worthy of his attention. While “target hardening” will help reduce the opportunity, there is still no shortage of potential terrorism targets.

By their very nature, certain facilities and events are more attractive terrorist targets than others. Law enforcement agencies should do a threat assessment of the potential targets within their jurisdiction. This will serve as a starting place in developing a plan for response to a WMD incident. Once the threat level is identified, steps can be taken to properly train and, if

necessary, equip law enforcement officers to safely and effectively respond to and investigate an incident involving the use or suspected use of a WMD.

POTENTIAL TARGETS

The following is a description of potential terrorist targets against which a WMD may be employed. It is by no means to be considered all-inclusive. Unlike law enforcement, which may find itself limited by jurisdictional boundaries, budgetary constraints, and legal restrictions, terrorists are criminals who know no such limits when it comes to target selection.

- Areas where large numbers of people gather, either on a daily basis or for a special event, are potential targets. Shopping malls, transportation centers, theaters, and congested downtown areas may all present an attractive target to a terrorist.
- Special events such as sporting events, concerts, political rallies, and other high-profile events are likely targets. They are particularly appealing because they may already be the subject of intense media coverage. The bombing that took place during the 1996 Olympics in Atlanta took on added significance because of the venue. A pipe bomb in a park in Atlanta would not have received the attention it did had it not been for the time and place.
- Government buildings and facilities are often the subject of protests. They are often open to the public because of the nature of the business transacted there and are therefore somewhat difficult to safeguard. No level of government should be considered immune from the threat of terrorism. Local, state, and federal facilities should all be identified by law enforcement when conducting a threat assessment in their jurisdiction.
- Organizations that do business with the government such as defense contractors and representatives of foreign governments should also be included in the threat assessment. Military facilities and offices must be included in any target list. Recruiting offices have been threatened and targeted in the past as well as places known to be frequented by military personnel.
- Facilities that are critical to public safety and the everyday operation of government and society must be considered. Power plants, sewage treatment facilities, rail lines, shipping terminals, and communications centers are all sites that may be subject to a WMD attack. These are frequently referred to as the infrastructure and may include police and fire facilities.
- Educational facilities such as colleges and special training centers may be potential targets. Research facilities may also be attractive to a terrorist looking for materials to create a WMD.
- Some facilities, such as abortion clinics and labs involved in research which utilize live animals, have already been threatened and acted against by terrorists having a variety of goals and motivations.
- Law enforcement personnel should pay careful attention to local, national, and international events to determine the possibility of terrorist targets within their area of responsibility. A foreign financial institution with an office in your jurisdiction may suddenly become a terrorist target based on political upheaval on the other side of the world. In today's world of instant communications and world travel, law enforcement officials cannot afford to be unaware of how events occurring else-