WAKE FOREST
UNIVERSITY

Hazardous Waste Contingency Plan

Updated January 2015

Introduction

In accordance with Federal, State and local requirements, a Hazardous Waste Contingency Plan is required for response to fires, explosions, or any unplanned sudden or non-sudden release of chemicals or hazardous waste or their constituents to air, soil or surface water. Any of these disasters could threaten human health or the environment of Wake Forest University.

WFU stores, handles and uses chemical products in conjunction with the education, research, scientific research, and facilities maintenance and operations.

This plan ensures that Wake Forest University complies with the requirements for owners or operators in Subparts C and D in 40 CFR part 265.

Purpose

The purpose of this document is to provide the basic procedures to use in the event of fires, explosions, or any unplanned sudden or non-sudden release of chemicals or hazardous waste or their constituents to air, soil or surface water.

This Contingency Plan shall be used by the Primary or Secondary Emergency Coordinator for emergencies involving chemical spills, releases to the environment, and fires or explosions involving chemical substances.

Scope

This document contains the basic procedures for dealing with chemical emergencies at the WFU Facilities. The WFU Facilities are listed in **TABLE 1.** Hazardous and non-hazardous waste chemicals are stored in the Hazardous Waste Accumulation Area located at each facility which is listed in **Table 1.**

TABLE 1 – WFU Reynolda Campus / Nano Technology Center

Facility Name	Facility Location	Facility EPA ID #	Type of Waste Generator	Location of Hazardous Waste Accumulation Area
Wake Forest University	1834 Wake Forest Road, Winston-Salem, NC 27109 336-758-4329	NCD 986166247	Large Quantity Generator (LQG)	Facilities and Campus Services - Coal Yard
Nanotechnology Center	501 Deacon Blvd, Winston-Salem, NC 27101 336-713-1187	NCR 000144196	Conditionally Exempt Small Quantity Generator (CESQG)	Chemical Delivery Loading Dock

Control Procedures

The primary chemical spill emergency control measure will be the adequate provisioning of containment areas.
Access to and housekeeping of each department shall be the responsibility of the organization that is the end user. The end user shall monitor the building to ensure chemical waste storage capacity is not exceeded and that all materials are stored with compatible materials.

Prevention and Detection

The following proactive measure will be taken in order to prevent a chemical emergency or to minimize impact:

- Personnel shall be educated and trained in the identification, handling, and storage of chemical products, including basic hazard communication and proper disposal of chemical wastes.

The following measures are taken to detect a chemical emergency before release to the environment:

- Hazardous Waste Accumulation Area and potential spill areas are routinely checked.
- Detailed inspections of Hazardous Waste Accumulation Areas shall be conducted on a weekly basis and/or after a chemical emergency in the Accumulation area.

Training

Campus personnel who have responsibilities in this plan will receive initial and annual training. Hazardous waste handlers will also receive initial and annual training pertaining to their responsibilities. The Environmental, Health and Safety Office and each department shall maintain copies of all training records.

Roles and Responsibilities

All Faculty, Staff and Students

- Report chemically related incidents and emergencies to supervisor, Department Head, and EHS Office
- Inspect chemical waste storage areas.
- Contact the University Police in the event of an incident that requires implementation of the Contingency Plan. University Police will alert the Emergency Coordinator(s).
- Do not attempt to stop a spill or come in contact with the spilled material.

WFU Environmental Health and Safety

- Maintain and update this document as needed.
- Advise on environmental, health and safety topics when consulted.
- Appoint and train Emergency Coordinators on an annual basis.
- Maintain records of all incidents.

WFU Emergency Coordinator (Primary and Secondary)

- Shall be either on-site or on-call.
- Shall be notified immediately in the event of an actual or imminent chemical emergency.
- Initiate actions to contain the chemical spill and start corrective action.
- Shall have the responsibility of coordinating all emergency response procedures.
- Shall be authorized by the Director of Environmental Health and Safety (EHS) to commit WFU resources in case of such an emergency.
- Notify all applicable agencies as required.
- Will yield incident command to public authorities when they are called into the facility.
- Conduct an investigation of all incidents.
- Prepare reports of all incidents and provide information to appropriate agencies as required.

University Police

- University Police will alert the Emergency Coordinator(s) upon notification of a spill, release or fire.
- Secure incident scene to prevent unauthorized access to the area.
- Oversee building or area evacuation as necessary.

Implementation of the Contingency Plan

The Emergency Coordinator (or his/her designee) has full authority to make the decision to implement the Contingency Plan. This decision may be based on one or more of the following conditions:

The Contingency Plan will go into effect immediately under the following conditions:

1. Fire or explosion related to hazardous material.
2. Sudden or non-sudden release involving a ***Poison by Inhalation*** hazard.
3. Sudden or non-sudden release involving ***Hydrofluoric Acid***.
4. Sudden or non-sudden release that would require use of greater than Level C PPE during response (i.e. due to dust, fumes, or other exposure where a supplied air respirator is required).
5. Sudden or non-sudden release of hazardous material of greater volume than listed below (other than Poison by Inhalation or Hydrofluoric Acid)

Flammable Liquids	***>2 liters***
Flammable Solid / Dangerous When Wet / Spontaneously Combustible	***>1 pound***
Oxidizer	***>1 pound***
Toxic Liquid / Toxic Solid (Other than Poison By Inhalation)	***>1 pound***
Corrosive (other than Hydrofluoric Acid)	***>500 mL***

Chemical hazard information will be based on MSDS information, PPE requirements, and / or the assessment of the Emergency Coordinator.

Furthermore, the Emergency Coordinator has full authority to implement the Contingency Plan if the above criteria are not met, but the Emergency Coordinator (or his/her designee) has assessed that there is an imminent or actual threat to human health or the environment.

See Appendix III for a description of the types of chemical wastes generated at Wake Forest University.

Whenever there is an imminent or actual emergency situation, the emergency coordinator (or his designee when the emergency coordinator is on call) must immediately:

(1) Activate internal alarms or communication systems, where applicable, to notify affected personnel; and

(2) Notify appropriate State or local agencies with designated response roles if their help is needed.

Whenever there is a release, fire, or explosion, the emergency coordinator must immediately identify the character, exact source, amount, and area extent of any released materials.

Concurrently, the emergency coordinator must assess possible hazards to human health or the environment that may result from the release, fire, or explosion. This assessment must consider both direct and indirect effects of the release, fire, or explosion (e.g., the effects of any toxic, irritating, or asphyxiating gases that are generated, or the effects of any hazardous surface water run-offs from water or chemical agents used to control fire and heat-induced explosions).

During an emergency, the emergency coordinator must take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other hazardous waste at the facility. These measures must include, where applicable, stopping processes and operations, collecting and containing released waste, and removing or isolating containers.

If the facility stops operations in response to a fire, explosion or release, the emergency coordinator must monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, wherever this is appropriate.

Immediately after an emergency, the emergency coordinator must provide for treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion at the facility.

WFU Emergency Coordinators

Personnel designated as Primary and Secondary Emergency Coordinators are listed below with their contact numbers.

PRIMARY EMERGENCY COORDINATOR

Stephen W. Fisenne
24-hour Phone: 336-830-9394

Home Address:
4762 Tatton Park Circle, Unit 2-D
Winston-Salem, NC 27103

SECONDARY EMERGENCY COORDINATOR

Michelle Lennon
24-hour Phone: 336-480-8480

Home Address:
4585 Emily Drive
Kernersville, NC 27284

The coordinators shall be thoroughly familiar with all aspects of the Contingency Plan, all basic operations and activities of the facility, the location and characteristics of hazardous materials and hazardous wastes, the location of records within the facility, and the facility layout.

Emergency Equipment

Emergency Equipment is listed in **TABLE 2. This** is the basic spill control equipment available for chemical spill response. Equipment quantities and brands may vary, and may change depending on the types of hazards identified.
See Site Map in Appendix I for locations listed on Table 2.

TABLE 2 – EMERGENCY EQUIPMENT

Item	Use	Location
Bulk containers of spill pillows, vermiculite, and booms.	Absorbing and stopping flow of chemical and / or petroleum release.	Coal Yard Storage Pad
Hand tools including non-sparking shovels, squeegees, drum uprighter and drum plug kit	Collection of absorbent / booms and chemical spills, up-righting tipped containers, and sealing containers that have small puncture holes.	Coal Yard Storage Pad
Portable spill response kit containing small quantities of vermiculite, spill pillows, drain stopper, tape, sorbent booms and towels for small spills.	For initial response to stop progression of spills and clean up of smaller quantity spills.	Coal Yard Storage Pad
Respirator cartridges (combination) and respirator masks.	For use by trained responders in potentially hazardous atmosphere.	Coal Yard Storage Pad
Air Sampling Meters	Check Oxygen, LEL, VOC, H2S and CO levels to ensure safe working atmosphere.	EHS Office
Level C and B suits, full-face supplied air respirators, supplied air tanks, and PPE gloves and boots.	Personal protection during emergency response and clean up to reduce chance of chemical exposure due to skin contact. Supplied air respirators for use by trained personnel in hazardous atmosphere to prevent inhalation of airborne chemicals and in low oxy	Portable Trailer and Coal Yard Storage Pad
Spill kits for minor spills are located in individual buildings where hazardous waste is generated.	Absorption of chemicals from small quantity spills.	Buildings 8, 9, 10

Emergency Communications Equipment

- Cell phones and / or two way radios are utilized in or near the Hazardous Waste Accumulation Areas.
- The fire alarm system monitors all smoke detectors, water flow alarms, manual pull stations, and fixed extinguishing systems. These systems will alert Campus Police in the event of an alarm.
- WFU Emergency Coordinators carry 2-way radios and / or cell phones.

Reporting an Emergency

- Contact WFU University Police at 758-5911 or 5911 from campus landlines.
- Provide the dispatcher with the following information:
- The nature of the emergency (chemical spills, injuries or fire)
- The location of the emergency
- What chemical has been released (if known)
- How much has been released (if known)
- The fire alarm system may be activated manually by any employee using the manual pull stations located at each emergency exit to initiate an evacuation/report an emergency.
- WFU University Police may receive an automatic alarm from the fire detection and extinguishing systems.
- WFU University Police may discover a chemical emergency during a routine patrol.

Evacuation

In the event of a fire/explosion/spill/release, the Primary or Secondary Emergency Coordinator will notify WFU University Police if an evacuation situation is imminent.

- WFU University Police shall initiate an evacuation if directed to do so by the Emergency Coordinator.
- WFU University Police shall dispatch an Officer to the scene to establish a perimeter if directed by the Emergency Coordinator.
- Evacuation Maps are located in hallways in each building. Wake Forest University personnel are instructed to treat hazardous chemical spill incidents like fire emergencies. Depending on the nature and amount of material spilled, evacuation would proceed in the same manner as a fire situation.
- An evacuation map for the Hazardous Waste Storage Area in the Facilities and Campus Services Coal Yard is located in Appendix II.

Control and Containment

This is the defensive action to halt the continued spread of a chemical spill or release and limit exposure from a chemical spill or release. These actions may involve public health and welfare protection activities, source control procedures, salvage operations, placement of physical barriers to halt the spread of the chemical by upstream impoundment, and the employment of certain materials to restrain the effects of the chemical on water sources.

Initial containment will be undertaken only by qualified WFU personnel with authorized and qualified outside spill response contractors assisting as necessary.

Cleanup action will include the use of absorbers and skimmers. Absorbents as listed in Emergency Equipment (Table 2) are available and will be used as directed.

Cleanup action for chemical spills released to soil or water may require the use of the spill response contractor(s) identified in this plan.

Notification of Authorities

If the emergency coordinator determines that the facility has had a release, fire, or explosion which could threaten human health, or the environment, outside the facility, he must report his findings as follows:

(1) If his assessment indicates that evacuation of local areas may be advisable, he must immediately notify appropriate local authorities. He must be available to help appropriate officials decide whether local areas should be evacuated.

The Emergency Coordinator shall contact City of Winston-Salem/Forsyth County Emergency Services (Fire, Emergency Medical Services, and Police) if assistance is required at: 911

(2) He must immediately notify either:
State of North Carolina EOC at 800-858-0368 (State EOC)
OR
National Response Center (using their 24-hour toll free number 800/424–8802).

The report must include:

(i) Name and telephone number of reporter;

(ii) Name and address of facility;

(iii) Time and type of incident (e.g., release, fire);

(iv) Name and quantity of material(s) involved, to the extent known;

(v) The extent of injuries, if any; and

(vi) The possible hazards to human health, or the environment, outside the facility.

If the chemical emergency meets the definition of a CERCLA or SARA (see glossary) reportable release, the Emergency Coordinator shall contact the National Response Center at: **1-800-424-8802**

Coordination Agreements

An attempt to make emergency arrangements with local public safety agencies has been made specifying each agency's function as listed in **TABLE 4**. Copies of this Plan have been sent to these agencies. Information concerning generated hazardous wastes, Hazardous Waste Contingency Plan, Primary and Secondary Emergency Coordinators, and a map of hazardous waste accumulation areas has been sent to the following agencies listed in **TABLE 4.**
Acknowledgements are on file at the WFU Environmental Health and Safety Office.

TABLE 4 – LOCAL PUBLIC SAFETY AGENCIES

Agency	Contact	Contact Number	Specific Function
City of Winston-Salem Storm Water Division	Keith Huff Stormwater Director City of Winston-Salem 101 N. Main Street Suite 357 Winston-Salem, NC 27101	311	Release to Storm Drain
Winston-Salem City/County Utilities Division	Ron Hargrove City of Winston-Salem 101 N. Main Street Suite 346 Winston-Salem, NC 27101	311	Release to Sanitray System
Winston-Salem/Forsyth County Office of Emergency Management	Mr. Melton J. Sadler Director Smith Reynolds Airport Room 104 Winston-Salem, NC 27105	336-727-2200	Emergency Management.
Winston-Salem Fire Department	Fire Chief - William "Trey" Mayo Public Safety Center Suite # 310 725 N. Cherry Street Winston-Salem, NC 27101	911	Fire Suppression and HazMat Response, EMS
Winston-Salem Police Department	Police Chief - Barry D. Rountree Public Safety Center 725 N. Cherry Street Winston-Salem, NC 27101	911	Security and Perimeter Control. Emergency Dispatch
Wake Forest University Baptist Hospital	Mr. Brad Bell Director Risk and Insurance Management Medical Center Blvd.	336-716-5578	Medical Treatment of Personnel.

Contractors

Table 5 lists the contractors and the arrangements to respond to chemical spill emergencies.

TABLE 5 – CONTRACTORS

Contractor	Contact	Specific Function
Shamrock Environmental 6106 Corporate Park Dr Browns Summit, NC	800-881-1098 336-375-1989	Respond to chemical spill emergencies, confine and contain chemical spills, and remediation services for environmental protection
Zebra Environmental 901 E Springfield Rd High Point, NC 27261	336-841-5276	Respond to chemical spill emergencies, confine and contain chemical spills, and remediation services for environmental protection

Internal Emergency Response Contacts

Internal Emergency Response contacts are listed below in **TABLE 6.**

TABLE 6- INTERNAL EMERGENCY RESPONSE CONTACTS

Contact	Department	Phone
Chief Regina Lawson	University Police	Internal line: 5911 External line: 336-758-5911 Direct line: 336-758-5056
August Vernon	Emergency Manager	Office: 336-758-3377
Michelle Lennon	Director, EHS	Cell: 336-480-8480 Home:336-784-1798
Steve Fisenne	Associate Director, EHS	Cell: 336-830-9394 Home: 704-543-8707
John Shenette	AVP, Facilites and Campus Services	Office: 336-758-4623
Emily Neese	AVP, Strategy and Operations	Office: 336-758-3721
Brian McGinn	Legal Counsel	Office: 336-758-3250
Michael Thompson	Chemistry Department	Office: 336-758-5324 Home: 336-896-8615
Christie Otten	Biology Department	Office: 336-758-4586
Eric Chapman	Physics Department	Office: 336-758-5532
Corey Hewitt	Nanotechnology Center	Office: 336-758-5337
Chris Stilley	Athletics Maintenance	Cell: 336-462-0391
Julie Groves	Risk Management Services	Cell: 336-816-2340

Follow-up Actions

Treatment, storage and disposal of recovered waste, contaminated soil and water will be conducted in accordance with federal, state and local laws or instructions from the Environmental Protection Agency (EPA).

Emergency equipment shall be restored to full operational status. Action will be taken to return the environment to its original condition. Restoration efforts for soil and water contamination will normally be accomplished through outside contractors.

The WFU Emergency Coordinator shall conduct an investigation of each incident to determine the root cause of the incident and establish steps to prevent recurrence. Copies of this investigation will be submitted to the Incident Commander, Department Chair or Manager/Director, EHS Office, Senior Administration (at AVP level or above) and regulatory authorities if requested.

Business continuity operations will proceed to ensure federal, state, and local authorities have been notified and that the resumption prerequisites have been met by those authorities.

Wake Forest will note in the operating record the time, date, and details of any incident that requires implementing the contingency plan. Within 15 days after the incident, Wake Forest University will submit a written report on the incident to the Regional Administrator in accordance with 40 CFR Section 265.56 (j).

The report must include:

(1) Name, address, and telephone number of the owner or operator;

(2) Name, address, and telephone number of the facility;

(3) Date, time, and type of incident (e.g., fire, explosion);

(4) Name and quantity of material(s) involved;

(5) The extent of injuries, if any;

(6) An assessment of actual or potential hazards to human health or the environment, where this is applicable; and

(7) Estimated quantity and disposition of recovered material that resulted from the incident.

Program Review

Annually, EHS will review the following and report significant findings to the AVP for Facilities and Campus Services:

- Hazardous Waste Contingency Plan for completeness and accuracy, including contact phone numbers.
- Deficiencies noted.
- Recommend revisions in document and in practice.

Amendment of contingency plan

The contingency plan must be reviewed, and immediately amended, if necessary, whenever:

(a) Applicable regulations are revised;

(b) The plan fails in an emergency;

(c) The facility changes—in its design, construction, operation, maintenance, or other circumstances—in a way that materially increases the potential for fires, explosions, or releases of hazardous waste or hazardous waste constituents, or changes the response necessary in an emergency;

(d) The list of emergency coordinators changes; or

(e) The list of emergency equipment changes.

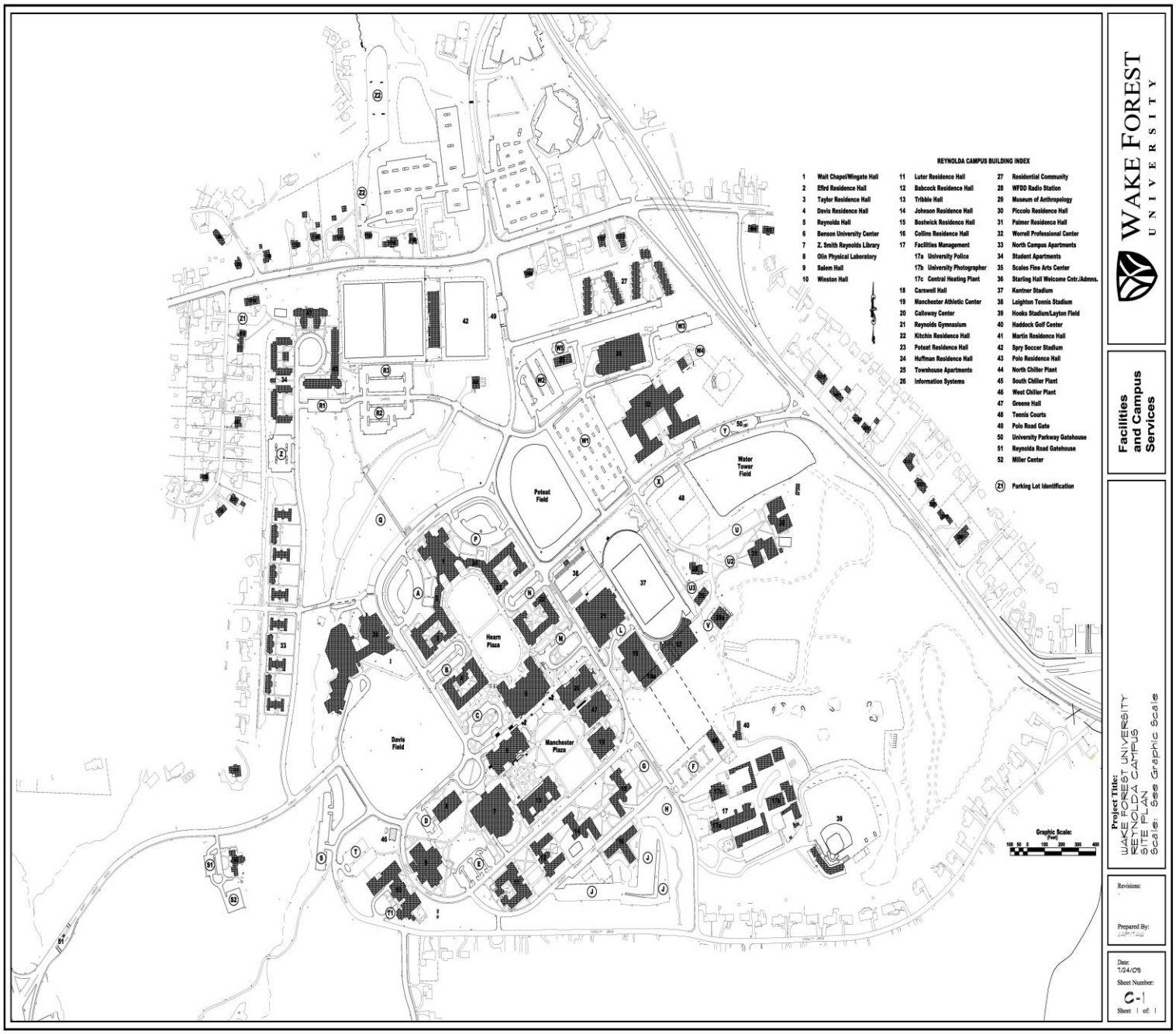
Appendix I

Emergency Equipment, Equipment Locations and Site Map

Location	Equipment
All Campus Buildings	Fire Extinguishers Small absorbent kits in hydraulic elevator equipment rooms
Coal Yard Storage Area (behind Bldg 17c)	Bulk containers of spill pillows, vermiculite, and booms Hand tools, non-sparking shovels, squeegees, drum up-righter and drum plug kit Respirator cartridges (combination) Sampling equipment Tyvek suits and Nitrile gloves Self-Contained Breathing Apparatus (SCBA)
EHS Trailer (mobile)	Portable spill response kit Confined Space Rescue Equipment Traffic Management supplies Tyvek suits and Nitrile gloves
Olin Physical Laboratory (Building 8) **Salem Hall (Building 9)** **Winston Hall (Building 10)** **Facilities Management (Building 17)** **Athletics Maintenance (behind Bldg 17b)** **Scales Fine Arts Center (Building 35)**	Portable spill response kit containing small quantities of vermiculite or spill pillows, sorbent booms or towels for small spills.

NOTE: Site Map following page

Appendix I - continued



Appendix II

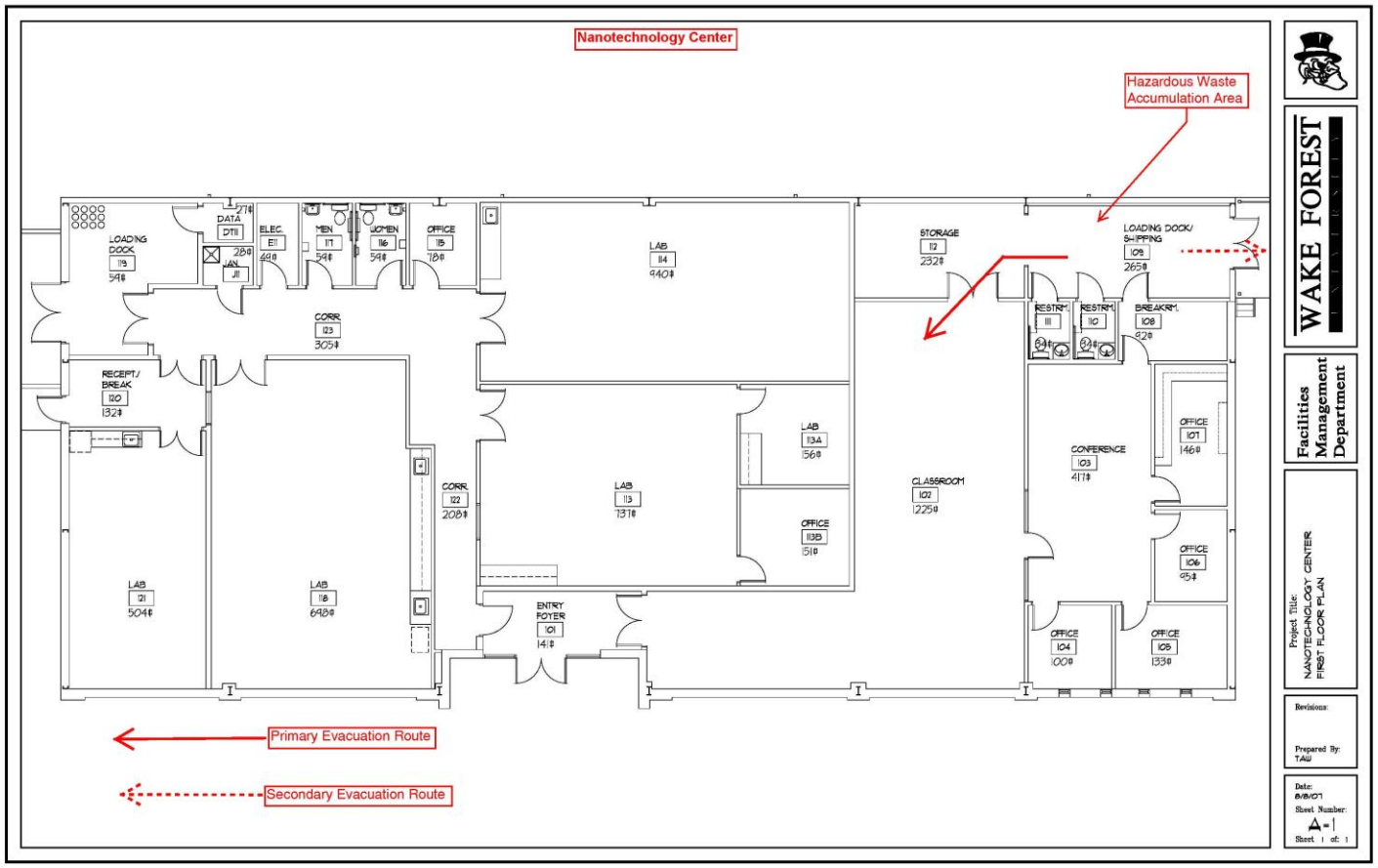
Evacuation Route from Reynolda Campus Hazardous Waste Accumulation Area

Primary Evacuation Route

Secondary Evacuation Route

Appendix II - continued

Evacuation Route from Nanotechnology Hazardous Waste Accumulation Area



Appendix III

Types of Chemicals and Wastes

Wake Forest University uses a wide variety of chemicals within the academic and research setting, as well as for general facility operations and maintenance. Waste materials generated on-site include various quantities of characteristic and listed Hazardous Wastes. Most laboratory wastes are generated in volumes of less than one (1) liter.

Generated hazardous wastes may fall under one or more of the following categories:

1.) Flammable Waste as defined in 40 CFR 261.21

(1) It is a liquid, other than an aqueous solution containing less than 24 percent alcohol by volume and has flash point less than 60 °C (140 °F),

(2) It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard.

(3) It is an ignitable compressed gas.

2.) Corrosive Waste as defined in 40 CFR 261.22

(1) It is aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5

(2) It is a liquid and corrodes steel (SAE 1020) at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55 °C (130 °F)

3.) Reactive Waste as defined in 40 CFR 261.23

(1) It is normally unstable and readily undergoes violent change without detonating.

(2) It reacts violently with water.

(3) It forms potentially explosive mixtures with water.

(4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

(5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

(6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.

(7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

(8) It is a forbidden explosive as defined in 49 CFR 173.51, or a Class A explosive as defined in 49 CFR 173.53 or a Class B explosive as defined in 49 CFR 173.88.

Types of Chemicals and Wastes

4.) Toxic Waste as defined by 40 CFR 261.24

(a) A solid waste (except manufactured gas plant waste) exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW–846, as incorporated by reference in §260.11 of this chapter, the extract from a representative sample of the waste contains any of the contaminants listed in table 1 at the concentration equal to or greater than the respective value given in that table. Where the waste contains less than 0.5 percent filterable solids, the waste itself, after filtering using the methodology outlined in Method 1311, is considered to be the extract for the purpose of this section.

5.) Listed Hazardous Waste as defined in 40 CFR 261 Subpart D may also be generated by the University.