United States Environmental Protection Agency
RCRA SUBTITLE C SITE IDENTIFICATION FORM

1. Reason for Submittal (Select only one.)

☐	Obtaining or updating an EPA ID number for on-going regulated activities (Items 10-17 below) that will continue for a period of time.
☐	Submitting as a component of the Hazardous Waste Report for _____ (Reporting Year)
	☐ Site was a TSD facility, a reverse distributor, and/or generator of ≥ 1,000 kg of non-acute hazardous waste, > 1 kg of acute hazardous waste, or > 100 kg of acute hazardous waste spill cleanup in **one or more months of the reporting year** (or State equivalent LQG regulations)
☐	Notifying that regulated activity is no longer occurring at this Site
☐	Obtaining or updating an EPA ID number for conducting Electronic Manifest Broker activities
☑	Submitting a new or revised Part A (permit) Form

2. Site EPA ID Number

V	T	D	0	0	0	6	3	6	5	6	3

3. Site Name

University of Vermont Environmental Safety Facility

4. Site Location Address

Street Address **667 Spear Street - UVM**		
City, Town, or Village **Burlington**		County **Chittenden**
State **Vermont**	Country **USA**	Zip Code **05405**
Latitude	Longitude	☐ Use Lat/Long as Primary Address

5. Site Mailing Address ☐ Same as Location Street Address

Street Address **667 Spear Street - UVM**		
City, Town, or Village **Burlington**		
State **Vermont**	Country **USA**	Zip Code **05405**

6. Site Land Type

☐ Private ☐ County ☐ District ☐ Federal ☐ Tribal ☐ Municipal ☑ State ☐ Other

7. North American Industry Classification System (NAICS) Code(s) for the Site (at least 5-digit codes)

A. (Primary) **611310**	C.
B.	D.

8. Site Contact Information

☑ Same as Location Address

First Name **Dorian**	MI **P**	Last Name **Evans**
Title **Environmental Compliance Manager**		
Street Address		
City, Town, or Village		
State	Country	Zip Code
Email **dorian.evans@uvm.edu**		
Phone **802-656-0767**	Ext	Fax

9. Legal Owner and Operator of the Site

A. Name of Site's Legal Owner

☐ Same as Location Address

Full Name **University of Vermont and State Agricultural College**	Date Became Owner (mm/dd/yyyy) **6/12/1991**

Owner Type: ☐ Private ☐ County ☐ District ☐ Federal ☐ Tribal ☐ Municipal ☑ State ☐ Other

Street Address **85 South Prospect Street**		
City, Town, or Village **Burlington**		
State **Vermont**	Country **USA**	Zip Code **05405**
Email **finance@uvm.edu**		
Phone **802-656-0219**	Ext	Fax
Comments **Contact information is listed for the Vice President for Finance & Administration. Questions should be directed to the Site Contact.**		

B. Name of Site's Legal Operator

☐ Same as Location Address

Full Name **University of Vermont and State Agricultural College**	Date Became Operator (mm/dd/yyyy) **6/12/1991**

Operator Type: ☐ Private ☐ County ☐ District ☐ Federal ☐ Tribal ☐ Municipal ☑ State ☐ Other

Street Address **85 South Prospect Street**		
City, Town, or Village **Burlington**		
State **Veremont**	Country **USA**	Zip Code **05405**
Email **finance@uvm.edu**		
Phone **802-656-0219**	Ext	Fax
Comments **Contact information is listed for the Vice President for Finance & Administration. Questions should be directed to the Site Contact.**		

10. Type of Regulated Waste Activity (at your site)

Mark "Yes" or "No" for all current activities (as of the date submitting the form); complete any additional boxes as instructed.

A. Hazardous Waste Activities

☑ Y ☐ N	1. Generator of Hazardous Waste—If "Yes", mark only one of the following—a, b, c		
	☑	a. LQG	-Generates, in any calendar month, 1,000 kg/mo (2,200 lb/mo) or more of non-acute hazardous waste (includes quantities imported by importer site); or - Generates, in any calendar month, or accumulates at any time, more than 1 kg/mo (2.2 lb/mo) of acute hazardous waste; or - Generates, in any calendar month or accumulates at any time, more than 100 kg/mo (220 lb/mo) of acute hazardous spill cleanup material.
	☐	b. SQG	100 to 1,000 kg/mo (220-2,200 lb/mo) of non-acute hazardous waste and no more than 1 kg (2.2 lb) of acute hazardous waste and no more than 100 kg (220 lb) of any acute hazardous spill cleanup material.
	☐	c. VSQG	Less than or equal to 100 kg/mo (220 lb/mo) of non-acute hazardous waste.
☐ Y ☑ N	2. Short-Term Generator (generates from a short-term or one-time event and not from on-going processes). If "Yes", provide an explanation in the Comments section. *Note: If "Yes", you MUST indicate that you are a Generator of Hazardous Waste in Item 10.A.1 above.*		
☑ Y ☐ N	3. Treater, Storer or Disposer of Hazardous Waste—Note: Part B of a hazardous waste permit is required for these activities.		
☑ Y ☐ N	4. Receives Hazardous Waste from Off-site		
☐ Y ☑ N	5 Recycler of Hazardous Waste		
	☐	a. Recycler who stores prior to recycling	
	☐	b. Recycler who does not store prior to recycling	
☐ Y ☑ N	6. Exempt Boiler and/or Industrial Furnace—If "Yes", mark all that apply.		
	☐	a. Small Quantity On-site Burner Exemption	
	☐	b. Smelting, Melting, and Refining Furnace Exemption	

B. Waste Codes for Federally Regulated Hazardous Wastes. Please list the waste codes of the Federal hazardous wastes handled at your site. List them in the order they are presented in the regulations (e.g. D001, D003, F007, U112). Use an additional page if more spaces are needed.

D001	D002	D003	D004	D005	D006	D007
D008	D009	D010	D011	D012	D013	D014
D015	D016	D017	D018	D019	D020	D021
D022	D023	D024	D025	D026	D027	D028
see	addl	page				

C. Waste Codes for State Regulated (non-Federal) Hazardous Wastes. Please list the waste codes of the State hazardous wastes handled at your site. List them in the order they are presented in the regulations. Use an additional page if more spaces are needed.

VT01	VT02	VT03	VT06	VT08	VT11	VT20
VT99						

11. Additional Regulated Waste Activities (NOTE: Refer to your State regulations to determine if a separate permit is required.)

A. Other Waste Activities

☑ Y ☐ N		1. Transporter of Hazardous Waste—If "Yes", mark all that apply.
	☑	a. Transporter
	☐	b. Transfer Facility (at your site)
☐ Y ☑ N		2. Underground Injection Control
☐ Y ☑ N		3. United States Importer of Hazardous Waste
☐ Y ☑ N		4. Recognized Trader—If "Yes", mark all that apply.
	☐	a. Importer
	☐	b. Exporter
☐ Y ☑ N		5. Importer/Exporter of Spent Lead-Acid Batteries (SLABs) under 40 CFR 266 Subpart G—If "Yes", mark all that apply.
	☐	a. Importer
	☐	b. Exporter

B. Universal Waste Activities

☑ Y ☐ N		1. Large Quantity Handler of Universal Waste (you accumulate 5,000 kg or more) - If "Yes" mark all that apply. Note: Refer to your State regulations to determine what is regulated.
	☑	a. Batteries
	☑	b. Pesticides
	☑	c. Mercury containing equipment
	☑	d. Lamps
	☑	e. Aerosol Cans
	☑	f. Other (specify) PCB Lamp Ballasts, Cathode Ray Tubes, Paint
	☐	g. Other (specify) _____
☑ Y ☐ N		2. Destination Facility for Universal Waste Note: A hazardous waste permit may be required for this activity.

C. Used Oil Activities

☑ Y ☐ N		1. Used Oil Transporter—If "Yes", mark all that apply.
	☑	a. Transporter
	☐	b. Transfer Facility (at your site)
☐ Y ☑ N		2. Used Oil Processor and/or Re-refiner—If "Yes", mark all that apply.
	☐	a. Processor
	☐	b. Re-refiner
☐ Y ☑ N		3. Off-Specification Used Oil Burner
☐ Y ☑ N		4. Used Oil Fuel Marketer—If "Yes", mark all that apply.
	☐	a. Marketer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner
	☐	b. Marketer Who First Claims the Used Oil Meets the Specifications

D. Pharmaceutical Activities

☐ Y ☑ N	1. Operating under 40 CFR Part 266, Subpart P for the management of hazardous waste pharmaceuticals—if "Yes", mark only one. Note: See the item-by-item instructions for definitions of healthcare facility and reverse distributor.
☐	a. Healthcare Facility
☐	b. Reverse Distributor
☐ Y ☑ N	2. Withdrawing from operating under 40 CFR Part 266, Subpart P for the management of hazardous waste pharmaceuticals. Note: You may only withdraw if you are a healthcare facility that is a VSQG for all of your hazardous waste, including hazardous waste pharmaceuticals.

12. Eligible Academic Entities with Laboratories—Notification for opting into or withdrawing from managing laboratory hazardous wastes pursuant to 40 CFR Part 262, Subpart K.

☐ Y ☑ N	A. Opting into or currently operating under 40 CFR Part 262, Subpart K for the management of hazardous wastes in laboratories— If "Yes", mark all that apply. Note: See the item-by-item instructions for definitions of types of eligible academic entities.
☐	1. College or University
☐	2. Teaching Hospital that is owned by or has a formal written affiliation with a college or university
☐	3. Non-profit Institute that is owned by or has a formal written affiliation with a college or university
☐ Y ☑ N	B. Withdrawing from 40 CFR Part 262, Subpart K for the management of hazardous wastes in laboratories.

13. Episodic Generation

☐ Y ☑ N	Are you an SQG or VSQG generating hazardous waste from a planned or unplanned episodic event, lasting no more than 60 days, that moves you to a higher generator category. If "Yes", you must fill out the Addendum for Episodic Generator.

14. LQG Consolidation of VSQG Hazardous Waste

☐ Y ☑ N	Are you an LQG notifying of consolidating VSQG Hazardous Waste Under the Control of the Same Person pursuant to 40 CFR 262.17(f)? If "Yes", you must fill out the Addendum for LQG Consolidation of VSQG hazardous waste.

15. Notification of LQG Site Closure for a Central Accumulation Area (CAA) (optional) OR Entire Facility (required)

☐ Y ☑ N LQG Site Closure of a Central Accumulation Area (CAA) or Entire Facility.
A. ☐ Central Accumulation Area (CAA) or ☐ Entire Facility
B. Expected closure date: _____ mm/dd/yyyy
C. Requesting new closure date: _____ mm/dd/yyyy
D. Date closed : _____ mm/dd/yyyy ☐ 1. In compliance with the closure performance standards 40 CFR 262.17(a)(8) ☐ 2. Not in compliance with the closure performance standards 40 CFR 262.17(a)(8)

16. Notification of Hazardous Secondary Material (HSM) Activity

☐ Y ☑ N	Are you notifying under 40 CFR 260.42 that you will begin managing, are managing, or will stop managing hazardous secondary material under 40 CFR 260.30, 40 CFR 261.4(a)(23), (24), (25), or (27)? If "Yes", you must fill out the Addendum to the Site Identification Form for Managing Hazardous Secondary Material.

17. Electronic Manifest Broker

☐ Y ☑ N	Are you notifying as a person, as defined in 40 CFR 260.10, electing to use the EPA electronic manifest system to obtain, complete, and transmit an electronic manifest under a contractual relationship with a hazardous waste generator?

18. Comments (include item number for each comment)

19. Certification I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations. **Note: For the RCRA Hazardous Waste Part A permit Application, all owners and operators must sign (see 40 CFR 270.10(b) and 270.11).**

Signature of legal owner, operator or authorized representative	Date (mm/dd/yyyy) 5/17/22
Printed Name (First, Middle Initial Last) **Richard H. Cate**	Title **VP for Finance & Administration**
Email **Richard.Cate@uvm.edu**	

Signature of legal owner, operator or authorized representative	Date (mm/dd/yyyy)
Printed Name (First, Middle Initial Last)	Title
Email	

United States Environmental Protection Agency

HAZARDOUS WASTE PERMIT PART A FORM

1. Facility Permit Contact

First Name **Same as Site Contact**	MI	Last Name
Title		
Email		
Phone	Ext	Fax

2. Facility Permit Contact Mailing Address

Street Address **Same as Site Mailing Address**		
City, Town, or Village		
State	Country	Zip Code

3. Facility Existence Date (mm/dd/yyyy)

6/12/1991

4. Other Environmental Permits

A. Permit Type	B. Permit Number	C. Description
E	**AP-04-006**	**Vermont Air Pollution Control Permit**
E	**5269-9003.R**	**Storm Water No-exposure Certification**

5. Nature of Business

Undergraduate and graduate education; medical college; and research in medical, environmental, animal, nutritional, and natural sciences

6. Process Codes and Design Capacities

Line Number		A. Process Code			B. Process Design Capacity (1) Amount	B. Process Design Capacity (2) Unit of Measure	C. Process Total Number of Units	D. Unit Name
0	1	S	0	1	11000	G	001	ESF

7. Description of Hazardous Wastes (Enter codes for Items 7.A, 7.C and 7.D(1))

Line No.		A. EPA Hazardous Waste No.				B. Estimated Annual Qty of Waste	C. Unit of Measure	D. Processes (1) Process Codes								D. Processes (2) Process Description (if code is not entered in 7.D1))
0	1	D	0	0	1	70000	P	S	0	1						
0	2	D	0	0	2											Included with above
0	3	D	0	0	3											Included with above
0	4	D	0	*	*											Included with above
0	5	F	0	0	1											Included with above
0	6	F	0	0	2											Included with above
0	7	F	0	0	3											Included with above
0	8	F	0	0	5											Included with above
0	9	U	*	*	*											Included with above
1	0	P	*	*	*											Included with above
1	1	F	0	2	7	100	P	S	0	1						

8. Map

Attach to this application a topographical map, or other equivalent map, of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all spring, rivers, and other surface water bodies in this map area. See instructions for precise requirements.

9. Facility Drawing

All existing facilities must include a scale drawing of the facility. See instructions for more detail.

10. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, and disposal areas; and sites of future storage, treatment, or disposal areas. See instructions for more detail.

11. Comments

RCRA SUBTITLE C SITE IDENTIFICATION FORM
Continuation Page

10. Type of Regulated Waste Ac□vity (at your site)

B. Waste Codes for Federally Regulated Hazardous Wastes.

D-Codes

D001	D002	D003	D004	D005	D006	D007	D008	D009	D010
D011	D012	D013	D014	D015	D016	D017	D018	D019	D020
D021	D022	D023	D024	D025	D026	D027	D028	D029	D030
D031	D032	D033	D034	D035	D036	D037	D038	D039	D040
D041	D042	D043							

F-Codes

F001	F002	F003	F004	F005	F005

K-Codes

None expected.

P-Codes

All P-listed waste in 40 CFR 261 and VT HWMR 7-215.

U-Codes

All U-listed waste in 40 CFR 261 and VT HWMR 7-215.

Appendix B

Facility Description

Facility Description of the Environmental Safety Facility (ESF)

General Information

The University of Vermont and State Agricultural College (UVM) operates the Environmental Safety Facility (ESF), a hazardous waste treatment and storage facility, EPA ID# VTD000636563, located at 667 Spear Street in Burlington, Vermont. The ESF is owned and operated by UVM.

NAICS Code and Description	611310 - Colleges, Universities, and Professional Schools
SIC Code and Description	8221 - Colleges, Universities, and Professional Schools

ESF Operations

The primary function of the ESF is the management of hazardous waste generated by UVM. UVM may also manage waste at the ESF from UVM tenants and affiliates, as well as source generators as listed in Appendix D, "UVM Source Generators." Management policies are set forth in UVM's Environmental Management Plan (EMP).

Hazardous and other regulated wastes are transported from UVM campuses to the ESF in accordance with DOT, OSHA, and Vermont Hazardous Waste Management Regulations (VHWMR). Once at the ESF, wastes are stored, then bulked or lab packed with compatible wastes, then shipped off-site for disposal at permitted Treatment, Storage, and Disposal Facilities (TSDF). Hazardous wastes can be stored at the ESF for up to one year. Waste can be stored for greater than one year only if UVM can show that storage beyond one year is solely for the purpose of accumulating sufficient quantities necessary to facilitate proper recovery, treatment or disposal, or if there is no acceptable disposal outlet. Procedures for extending storage beyond one year are detailed in Appendix E, "Process Information and Container Management Plan."

ESF Site Description

The ESF is located in the City of Burlington at 667 Spear Street, approximately one mile South of UVM's athletic facilities within the UVM BioResearch Complex (BRC) on the West side of Spear Street. The land on which the ESF sits, is owned by UVM. The Burlington Country Club golf course forms the North and West boundaries of the site, approximately 300 feet from the ESF. The BRC is bounded by Spear Street on the East, approximately 1200 feet from the ESF. The Meadowbrook Condominium Association's multi-family housing, and the Roman Catholic Diocese's Rice High School, are located approximately 1000 feet to the South, and southwest respectively, of the ESF on the other side of a field cultivated by the UVM's Miller Research Farm.

The ESF is sited at the BRC to the West of the existing Large Animal Facility. The Large Animal Facility houses some UVM research activities as well as UVM's low-level radioactive waste storage area. These locations are not part of the ESF nor are they covered by this permit.

The land on which the ESF is built is approximately 3 acres in size. This parcel of land is defined by the golf course on the north, UVM's Large Animal Facility on the east, a UVM agricultural field to the south, and a hedgerow and drainage swale on the west. The ESF was built in 1993 and waste operations began in 1994. The land was previously used by UVM's College of Agriculture for small garden plots and as a test field for a study on the growth of hay. The field is not prime agricultural land because of poor drainage and wet conditions at various times of the year.

The ESF is located in close proximity to the main campus. This provides ease of transporting materials, as well as a quick response time for UVM Police Services to the ESF and a quick response time for the ESF staff to campus. Vehicles access Spear Street at the intersection of the BRC access road and Spear Street, located approximately 1/4 mile south of the UVM Dairy Farm on the west side of the road. The ESF site has been designed to handle tractor-trailer rigs and can accommodate a truck with a wheelbase of 50 feet.

Two access routes have been designed for emergency vehicles, one to the north and one to the south on the east side of the site. The paved drive all the way around the building is wide enough for emergency vehicles, including fire trucks. Most of the site is paved with asphalt; however, the truck bay and area directly in front of the truck bay are concrete.

Car traffic at the ESF site generally consists of privately owned vehicles of the people working in the building (approximately 6 to 9 people arriving and leaving work). The ESF has ten parking spaces including one handicap accessible space. The vehicles typically on site include one box-style truck and van, which are usually stored in the truck bay when not in use, and approximately seven ESF employee cars. Truck and van traffic consists of several daily trips by the ESF staff to the main campus. Typical delivery, maintenance and trash removal vehicles already serving the BRC also serve the ESF. Occasional traffic associated with training and meetings is also expected.

A security fence has been constructed around the ESF with access through a remote operated, automatic gate as well as a locked, manually operated gate. Exterior lighting has been installed for security and safety purposes.

The ESF site is elevated above the surrounding area. The entire site is pitched to drain into a moat along the Southern and Western sides to control runoff from the area and prevent run-on from outside the site. There is a subsurface drainage system outside along the north side of the building, adjacent to the waste storage rooms, to divert rain and snow water away from the ESF and into the moat.

Topographic maps of the site, ESF construction plans, a letter from the Vermont Agency of Natural Resources stating that the site is not within the 100-year flood plain and a wind rose are included as Attachments B-1, B-2, B-3, and B-4, respectively.

Description of the Environmental Safety Facility

The ESF consists of the site contained within a 6 foot chain-link fence that includes a 9,000 square foot main building; and a 59 square foot, prefabricated steel, Reactives Storage Building. Both buildings and all areas within the fence-line are considered the ESF and are managed in accordance with this permit.

The main building is constructed of non-combustible concrete block with a concrete floor slab on grade. It has 9000 sq. ft. of floor area on two levels. The building includes offices for the ESF staff, a QA/QC laboratory, loading dock, truck bay, work area, chemical storage rooms, a chemical distribution and exchange room, restroom, locker room and shower, storage, mechanical spaces, and corridors.

The restroom, shower, laboratory sink, and workroom sink are connected to the South Burlington public sewer system. There are no floor drains in the hazardous waste storage areas of the ESF. Hazardous chemicals are not discharged into the sanitary sewer system.

The ESF alarm systems include fire detection, sprinkler flow, and intruder alarms. The entire ESF is protected by a wet sprinkler system connected to the Champlain Water District water main. The alarm systems are supervised twenty-four hours a day by the UVM's Physical Plant and Police Services Departments at a central monitoring station on the main campus. All lights, switches, fans, and other electrical devices, in the areas where hazardous wastes are stored, are intrinsically safe, to guard against fire or explosion.

The Reactives Storage Building is located approximately 40 feet from the main building. The back of the Reactives Storage Building is approximately 5 feet from the 6 foot high, chain-link, perimeter fence, which borders on 200 feet of unused marsh area owned by UVM. It is used to store water reactive, air reactive, poly-nitrated compounds, and other reactive materials.

All hazardous wastes are stored inside either the ESF main building or the Reactives Storage Building.

Description of the Interior Spaces

Offices

The offices have fluorescent lighting and positive ventilation with respect to the rest of the building.

Laboratory

The laboratory is well lighted. A 6-foot chemical fume hood is located on one wall. There is a sink with connection to the sanitary sewer and a drench hose style eyewash. Limited quality assurance testing may be conducted in the fume hood. Office work area is also provided in the laboratory.

Work Area
This area is well lighted with explosion proof lighting. This area has a sink with a connection to the sanitary sewer, a safety shower/eyewash, and a pouring station to consolidate waste chemicals into bulk containers. The pouring station includes three stations with snorkel ventilation and an ABC, dry-chemical fire system.

Loading Dock
This area is located at the end of the truck bay and has easy access to the work area. The area includes a dock leveler, capable of serving all types of vehicles servicing the ESF, and a door from the truck bay for driver access. A containment sump is located below the dock leveler to contain a spill if one should occur at this transfer point.

Chemical Distribution and Exchange Room
This room is used to store stock chemicals for academic teaching labs and other campus users, and to store pre-owned chemicals for redistribution to campus users. It is well lighted with explosion proof lighting and equipped with explosion proof electrical outlets. Managing the distribution of stock chemicals and pre-owned chemicals is one part of UVM's waste minimization and toxics use reduction efforts required by law. Only non-waste chemicals are stored in this room.

Truck Bay
The truck bay is a fully-enclosed, roofed garage area with a concrete paved surface large enough to receive a 60 ft. long semi-tractor trailer. A 12-foot wide automatic overhead door serves as the entrance into the truck bay from the outside of the building. The truck bay serves as a garage for the ESF hazardous waste transportation box truck and other vehicles, as needed.

Waste Storage Areas - Main Building
The ESF has nine waste storage areas in the main building, each room measures approximately 21.5 feet by 8.5 feet and is designed to store up to twenty (20), 55-gallon drums or the equivalent capacity in variable sized containers. Only compatible materials are stored together in each room.

There are two separate ventilation systems; one for the four storage rooms on the West and the other for the five storage rooms on the East. Each room is ventilated above and below the floor grate to prevent a buildup of any fumes.

An access door from inside the building opens from the direction of egress out of each area. An emergency exit opening directly outside the building is located in each chamber.

The floors are constructed of epoxy coated fiberglass grate to allow any spilled material to fall into a ventilated sump area. The floor grates are removable. The capacity of the sump in each room is equal to the volume of all the drums (20 x 55 gallons =1,100 gallons) plus 20 minutes of fire sprinkler flow. The threshold at the emergency exit door of each room is 8 inches higher than the door into the building so in the event of a catastrophic release, the materials would overflow into the building instead of to the exterior. Each sump measures approximately 21.5 feet by 8.5 feet (same footprint as the storage room) by 2 feet in depth. The floor and walls of each sump are

constructed of epoxy-coated concrete; the joints are filled with non-shrink grout. The floor of each sump is sloped to the center of the sump/room.

The storage areas are constructed of two hour rated concrete block with one and one-half hour rated doors to meet the building code requirements for Type H (Hazardous) Occupancy rating of this building.

Waste Storage Area – Corridor
This area is well lighted with explosion proof lighting and equipped with three emergency eyewash and shower stations. Two emergency communication phones are located in the corridor. Wastes may be temporarily staged in the corridor in preparation for outbound shipments.

Description of Reactives Storage Building

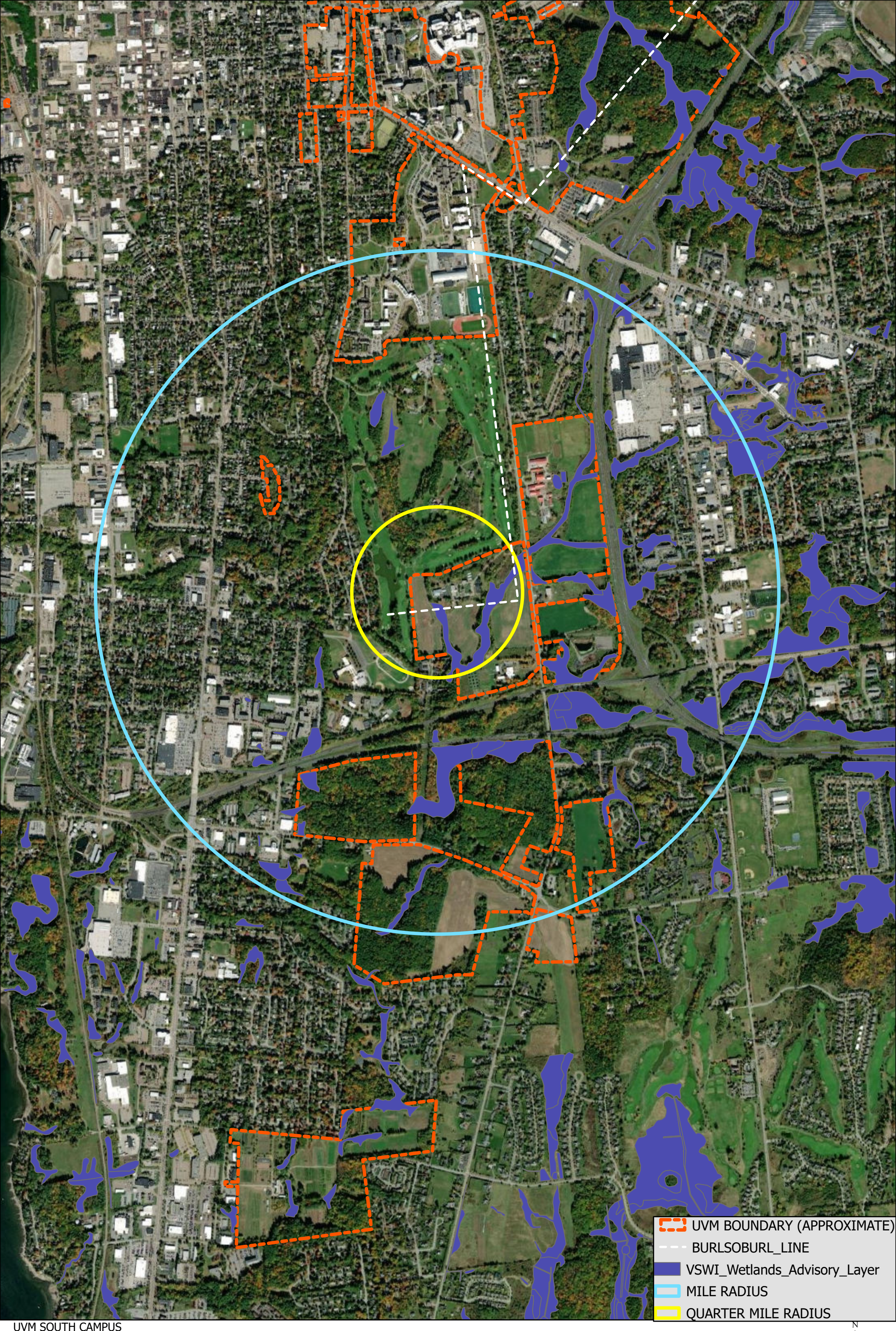
The ESF's reactive materials storage building has one waste storage area designed to store up to twelve (12), 55-gallon drums or the equivalent capacity in variable sized containers. Materials that may ignite, explode, generate toxic gases or otherwise react in a violent manner when in contact with air, water, or other initiating factor will be stored in this area. Each reactive material is contained within its laboratory container and packed within a secondary, DOT-rated shipping container. The Reactives Storage Building itself forms a third container. The building is commercially manufactured with the following safety features:

- Fire resistant wallboard and steel construction;
- Corrosion protected steel;
- UL listed, Group D, Division 1 electromechanical exhaust ventilation system;
- UL listed, Groups C and D, Division 1 lighting and electrical receptacle;
- Pressure release panel on rear wall (releases at 20 psi), safety chained to wall;
- 250-gallon capacity containment sump lined with 20 mils HDPE;
- UL listed and FM approved, Pre-engineered, dry chemical fire suppression system with exterior, audible alarm, fusible link detection for automatic activation and means for manual activation
- Door locked and keyed to ESF key set, explosion relief panel is equipped with security bars;
- Class 1, Groups C & D, Division 1 lighting, fan and electrical outlet; and
- Static grounding system.

The Reactives Storage Building is located 40 feet to the northeast of the main ESF building within the perimeter fence. As shown on maps in attachment B-1, the building is located greater than 15 meters (or greater than 50 feet) from UVM's property line.

Attachment B-1

Orthographic Site Maps



UVM SOUTH CAMPUS
2018 ESRI IMAGERY
Map Produced by UVM Planning, Design, & Construction

Attachment B-2

Environmental Safety Facility
Construction Drawings

CONTACT UVM–DIGSAFE PRIOR TO ANY EXCAVATION AT (802) 656–8344

LEGEND

- FENCE LINE
- 302 EXISTING CONTOUR
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- EXISTING WATERLINE
- PROPOSED WATERLINE
- HYDRANT
- GATE VALVE
- SANITARY SEWER MANHOLE
- CONCRETE CURB
- DRAINAGE COURSE
- PROPOSED GRADE
- HAYBALE DAM
- EROSION SILT FENCE
- NO.102 MONITOR WELL
- WARNING SIGN MOUNTED ON FENCE
- E,T,G EXIST. ELECTRIC, TEL. OR GAS LINE
- E,T,G NEW ELECTRIC,TEL OR GAS LINE
- EDGE OF WETLAND (W–H–N)
- LP UDERGROUND PROPANE LINE

REMOVE FENCING AND CHICKEN COOPS

EXISTING HORSERING

INV.=301.5 G — G 2" NATURAL GAS (FUTURE) — G

INV.=301.2 G

NEW 12" ACCOMP

MINIMIZE DISTURBANCE WITHIN WETLAND AREAS

EDGE OF NEW PAVEMENT

PROVIDE 4" GAS CONDUIT UNDER THE NEW ROAD

NEW GRAVEL PARKING AREA

EXISTING GRAVEL DRIVE

SM-29

SM-16

CHAIN LINK FENCE

NO.105

TRANSFORMER INSTALLED AS PER PLAN

BOLLARDS SM-24

SM-11

EXTERIOR POLE LIGHT (TYP.)

CONCRETE CURB

REACTIVES STORAGE BUILDING

FIRE LANE

N 42.200

E 50,000

EXISTING PARKING BUMPER

EXISTING SEPTIC TANK

17" SECTION DROP CURB 1" REVEAL

SM-10

SAVE 24" POPLAR

PROPOSED ENVIRONMENTAL SAFETY FACILITY

F.F.ELEV. = 307.6

NEW BITUMINOUS DRIVE

SAVE EXISTING TREES

REMOVE TREES

LARGE ANIMAL FACILITY BUILDING NO.727

NEW MTC

EXISTING TRANSFORMER

CONDENSER PAD

PROVIDE CHECK VALVE FOR BACKFLOW PREVENTION PER MECH. DRAWING

4" CONDUIT FOR GAS INSTALLED AS PER PLAN

SEE AS BUILT 1-15-93

LP TANK FARM

DRAIN LINE FROM TRUCK BAY TRENCH DRAIN INV.=302.27

SM-28

SM-9

SLOPE TO MATCH RAMP

CLEANOUT

RAMP

DEPRESS

4" DUCTILE IRON INV.=300.00

NEW 6" DI WATER SERVICE

REST. RCH OFFICE

ENTOMOLOGY RESEARCH BUILDING NO.723

CONNECT NEW WATER LINE INTO EXISTING LINE SERVING HYDRANT

SM-6

REMOVE EXISTING TREES AS REQUIRED

METAL END SECTION INV.=300.00

EXISTING SEPTIC TANKS

ENTOMOLOGY BUILDING NO.726

GREENHOUSE

NEW 6" SDR 35 PVC

FIRE LANE (SEE DETAIL ON SHEET D-1)

SM-26

SM-4

SM-5

NEW 8" SDR 35 PVC SEWER S=0.005

NEW 12" D WATER MAIN

PROVIDE SEEPAGE COLLAR

DEPRESSED CURB BOLLARDS (TYP.)

NEW GENERATOR ON CONC. PAD SEE ELEC. FOR PAD DETAILS

NO.151

GATE VALVE

CONC. S.W.

LOADING BAY

BUILD NEW INVERTS INTO EXIST. WET WELL (SEE SHT. D-2) 4" IN @ INV. IN=298.07 8" INV. OUT=297.97

THE CONTRACTOR SHALL REMOVE THE PUMPS, FLOATS, AND FORCE MAIN PIPING FROM THE PUMP STATION AND FILL INTERIOR WITH 3500 PSI CONCRETE UP TO PIPE INVERTS. FORM INVERTS IN ACCORDANCE WITH MANHOLE DETAIL ON SHEET D-2.

INV.=300.3

TO M.H. #2 SEE SHEET P-1 FOR CONTINUATION

SM-8

NEW 6" SDR 35 PVC

EDGE OF EXISTING GRAVEL DRIVE

RIPRAP

6" INV.=299.00

CONCRETE SUMP BOTTOM ELEV.= 298.0

GATE VALVE

PROVIDE SEEPAGE COLLAR

NO.102

METAL END SECTION INV.=299.60

SM-12

TBM– TOP OF SURVEY POINT "DOG" = 320.56

MH #1 RIM =302.5 INV. IN = 298.77 INV. OUT= 298.67

BUILDING NO.721

BUILDING NO.722 (NO FUNCTIONAL PLUMBING)

SEE SHEET S-2 FOR PAVING LIMITS AND GRADING OF REMAINING DRIVE AREA

NEW GRAVEL PARKING AREA

REMOVE MANURE PILE

MOVE EXISTING BARN CLEANER TO SOUTH SIDE OF BLD. NO.721

EXISTING BARN CLEANER TO REMAIN

CONNECT INTO EXISTING SEWER PIPING WITHIN 2' OF EXTERIOR WALL

CLEANOUT

NEW 4" SDR 35 PVC SEWER MIN. S=1/8"/FT

EXISTING PIPE TO BE ABANDONED

ABANDON EXISTING SEPTIC TANK AND SEWAGE DISPOSAL SYSTEM

TOPSOIL STOCKPILE

EXISTING DRAINAGE SWALE

GRASS SWALE

NO. 103

NO.104

CITY OF BURLINGTON
CITY OF SOUTH BURLINGTON

CITY MONUMENT

SEE SHEET L-1 FOR LANDSCAPING DETAILS

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

NOTES: TOPOGRAPHIC INFORMATION SHOWN WAS PROVIDED BY THE UNIVERSITY OF VERMONT FROM WORK PERFORMED BY HARRIS ABBOTT AND TERRY HARRIS.

PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL EXCAVATE TEST PITS TO DETERMINE LOCATION AND ELEVATION OF EXISTING WATER MAINS AND STORM PIPES AT ROAD CROSSING .

REGISTERED PROFESSIONAL ENGINEER — KENNETH M. STONE No. 3252 REGISTERED

date	revision	by
5-19/93	GENERAL	BJT
5-13-93	ADDED SM-3-5,8-12,15,18,19,23-26, & 29	MBW/DJG
4-7-93	REVISED HYDRANT AND WATER SERVICE LOCATION, REVISED BLDG. #721 SEWER SERVICE, ADDED CLEANOUT	DJG
9-15-92	ADDED CHECK VALVE ON WATER SERVICE	DJG
8-20-92	revision GENERAL REVISIONS	DJG

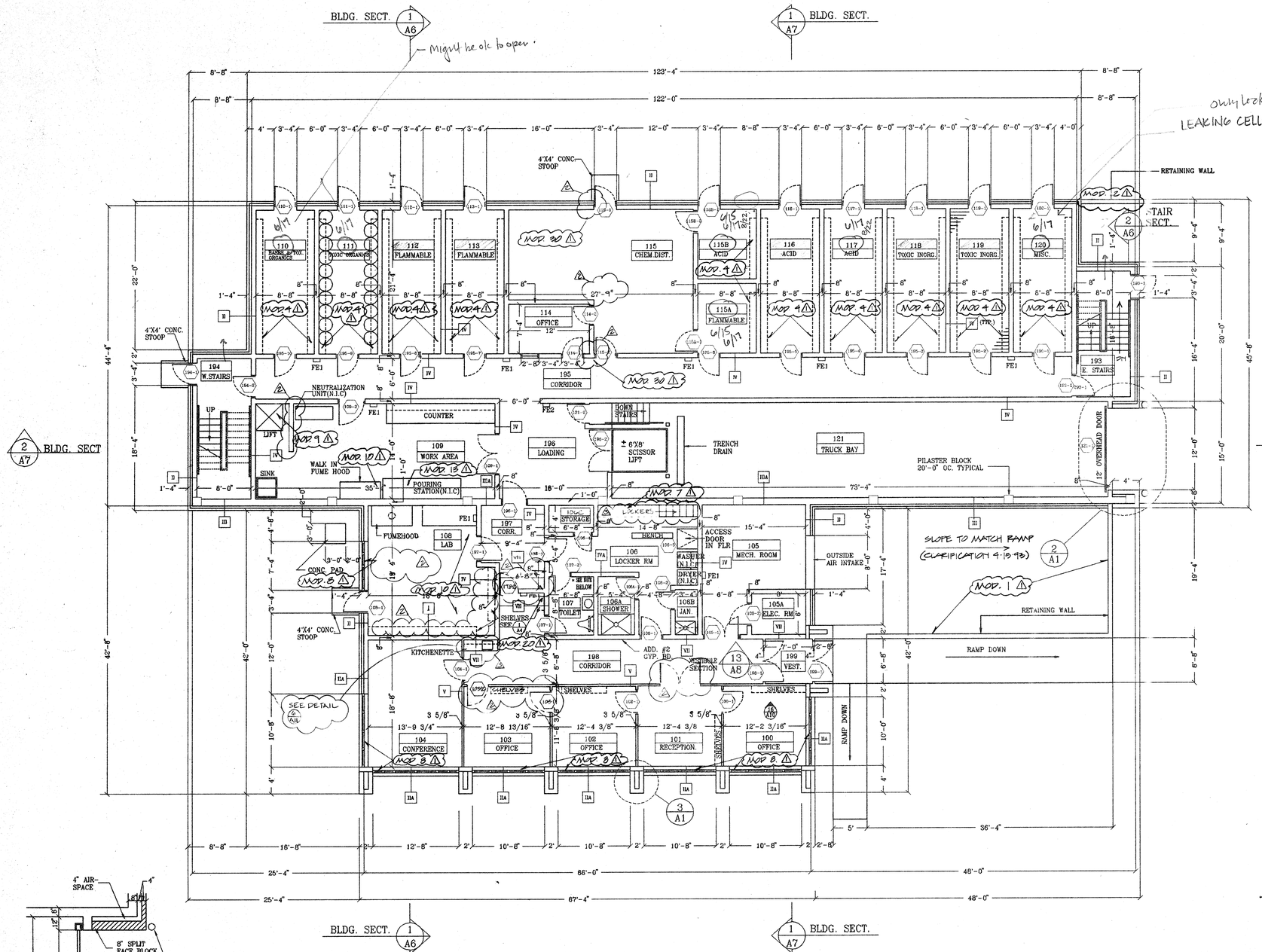
REVISIONS
NO. DATE
1 AS BUILT JDL

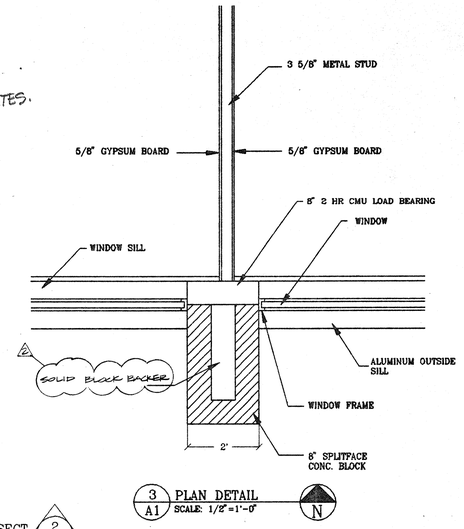
UNIVERSITY OF VERMONT
ENVIRONMENTAL SAFETY FACILITY
SPEAR STREET, BURLINGTON, VT.

SITE PLAN

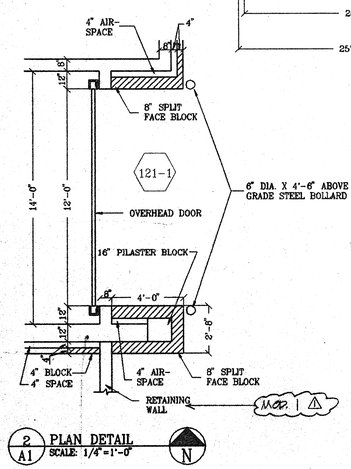
proj. no.	90-41
survey	UVM/AWH
design	DJG
drawn	DJG/LHA
checked	KMS
date	12-1-92
scale	1"=20'
dwg. no.	S-1

LAMOUREUX & STONE
14 Morse Drive
Essex Junction, Vermont 05452
(802) 878-4450
Consulting Engineers Inc.





3/A1 PLAN DETAIL
SCALE: 1/2" = 1'-0"



2/A1 PLAN DETAIL
SCALE: 1/4" = 1'-0"

1/A1 FIRST LEVEL FLOOR PLAN

SCALE: 1/8" = 1'-0"

NOTES AND LEGEND:

* URINAL AND SCREEN DELETED BY ADDENDUM

SEE A4 FOR 1/4" = 1'-0" SCALE PLAN OF ROOMS AND STAIRS ON THIS LEVEL

FE1 FIRE EXTINGUISHER- CLASS 4A: 40 BC-DRY CHEMICAL

FE2 FIRE EXTINGUISHER- CLASS D: METAL FIRES (MOD-41)

⬡ DOOR NUMBERS

▭ SHELVES AND STANDARDS- (FOR SHELF AND HARDWARE SPECIFICATION AND SHELVES IN ROOM 100, 101, 102, 103 SEE: 16/A10

BUILDING CODE INFORMATION BLOCK	
APPLICABLE CODES	1988 VERMONT FIRE PREVENTION AND BUILDING SAFETY CODE AS ACCEPTED BY THE CITY OF BURLINGTON, VERMONT INCLUDING 1987 BOCA BASIC BUILDING CODE AND 1988 BOCA SUPPLEMENT NFPA 101-LIFE SAFETY CODE ALL OTHER CODES REFERENCED IN THE STATE CODE
CODE ENFORCEMENT	CITY OF BURLINGTON DEPARTMENT OF PUBLIC WORKS, INSPECTION SERVICES DIVISION 33 KILBURN STREET P.O. BOX 849 BURLINGTON, VERMONT 05402 (802)863-9094
PERMIT REQUIREMENTS	THE CONTRACTOR SHALL BE RESPONSIBLE TO PAY FOR & SECURE FOR THE OWNER; ALL BUILDING, MECHANICAL, PLUMBING, AND ELECTRICAL PERMITS REQUIRED. COPIES OF THESE PERMITS SHALL BE DELIVERED TO THE OWNER BEFORE WORK BEGINS.
CODE CLASSIFICATIONS	OCCUPANCY: H-HAZARDOUS CONSTRUCTION: TYPE 2A PROTECTED CORRIDORS: 1 HR EXIT ACCESS CORRIDORS STAIRWAYS: 2 HR ENCLOSURE CHEMICAL STORAGE ROOMS: 2 HR WALLS & CEILING (ROOMS 110 THROUGH 120 EXCEPT RM 114 (CLARIFICATION 12/23/92) TRUCKBAY: 1 HR RATED WALLS AND ROOF (CLARIFICATION 12/23/92) ROOF: 1 HR (U.L. ASSEMBLY P230)(CLARIFICATION 12/23/92)
(1 HR CLARIFICATION 4-15-93)	

CODE CLASSIFICATIONS CONTINUED	FIRST LEVEL : ± 9000 S.F. SECOND LEVEL: ± 5025 S.F. (MEZZ.) WORK AREA: 109 & STORAGE 201 TO HAVE 1 HR. FIRE RATING DUE TO LIFT OPENING.

WALL TYPES LEGEND & SCHEDULE

(REFER TO DWG A2 & A4 ALSO)

SYMBOL	CONSTRUCTION DESCRIPTION	HEIGHT	DETAIL
I	8" THICK 2 HR CMU LOAD BEARING	TO BAR JOIST ROOF STRUCT.	1/A6
II	8" THICK 2 HR CMU INNER WYETH LOAD BEARING WITH 4" INSULATED AIR SPACE & 4" EXTERIOR CMU	TO BAR JOIST ROOF STRUCT.	1/A6
IIA	8" THICK 2 HR CMU INNER WYETH LOAD BEARING WITH 4" INSUL. AIR SPACE & 4" EXTERIOR CMU FUR INSIDE OF EXTERIOR WALLS WITH 1 1/2" CHANNELS AT 24" O.C WITH 1 1/2" POLYSTYRENE INSUL. & 5/8" TYPE X GYP. BD. TO CEILING HGT. IN ROOMS 100,101,102,103&104 PER ADDENDUM #2	TO BAR JOIST ROOF STRUCT.	16/A8
III	12" THICK 2 HR CMU INNER WYETH LOAD BEARING WITH 16" PILASTER BLOCKS, 4" INSUL. AIR SPACE & 4" EXTERIOR CMU	TO BAR JOIST ROOF STRUCT.	3/A6
IIIA	12" THICK 2 HR CMU WITH 16" PILASTER BLOCKS	TO BAR JOIST ROOF STRUCT.	4/A6
IV	8" THICK 2 HR CMU LOAD BEARING&NONLOAD BEARING	TO UNDERSIDE OF SLAB OR EVEN BLOCK TO GYP. BD. CEILING	1/A6
IVA	8" THICK 2 HR CMU NONLOAD BEARING	TO EVEN BLOCK COURSE ABOVE SUSP. CEILING	1/A2
V	3 5/8" 20 GAUGE METAL STUDS 16" O.C. WITH 1 LAYER 5/8" FIRERATED GYPSUM BOARD BOTH SIDES. INSULATE WITH SOUND ATTENUATION BLANKETS REFER TO NOTE BELOW	TO GYPSUM BOARD AT BAR JOISTS	1/A7
VI	3 5/8" 20 GAUGE METAL STUDS-16" O.C. WITH 1 LAYER 5/8" FIRERATED GYPSUM BOARD BOTH SIDES	TO GYPSUM BOARD AT BAR JOISTS	1/A6
VII	8" THICK 2 HR CMU LOAD BEARING & NON-LOADBEARING WITH 7/8" FURRING CHANNELS 16" O.C VERTICALLY WITH 1 LAYER OF 5/8" TYPE X GYP. BD. WALLS IN CORRIDOR 198 AND NORTH WALL OF VESTIBULE 199 PER ADDENDUM #2	TO 8 FT. AFF.	

NOTE: INSTALL A 3 1/2" X 8'-0" FIRE RETARDANT STUD INSIDE EACH METAL STUD ON WALLS SCHEDULED TO RECEIVE SHELVES. INSTALL RESILIENT CHANNEL 16" O.C. HORIZONTALLY ON THE EAST SIDE AND NORTHSIDE OF WALLS. CAULK TOP AND BOTTOM OF GYPSUM BOARD.

UNIVERSITY OF VERMONT
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109 SOUTH PROSPECT STREET
BURLINGTON, VERMONT 05405-0016
TELEPHONE (802)656-3291

REGISTERED ARCHITECT ROBERT B. HOLDRIDGE NO. 961 STATE OF VERMONT

CONSULTANTS

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CONSULTING ENGINEERS INC.
14 MORSE DRIVE
ESSEX JUNCTION, VERMONT 05452
(802)878-4450

CHAMPLAIN CONSULTING ENGINEERS P.C.
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COLCHESTER, VERMONT 05446
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BURLINGTON, VERMONT 05402
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WILLIAM SCOTT, P.E.
345 US ROUTE 2
GRAND ISLE, VERMONT 05458
(802)372-5588

PROJECT

ENVIRONMENTAL SAFETY FACILITY
667 SPEAR STREET
BUILDING 728

PROJECT NO. ENSF89020
SCALE: 1/8" = 1'-0"
DRAWN BY CRF
CHECKED BY KB
DATE: 12-01-92

REVISIONS

DATE	BY	DESCRIPTION
12/23/92	CRF	ADDENDUM CHANGES
4/15/93	JRP	MODIFICATIONS 1
6/24/94	JRP	AS BUILTS 2
7/15/94	JDL	AS BUILTS 3

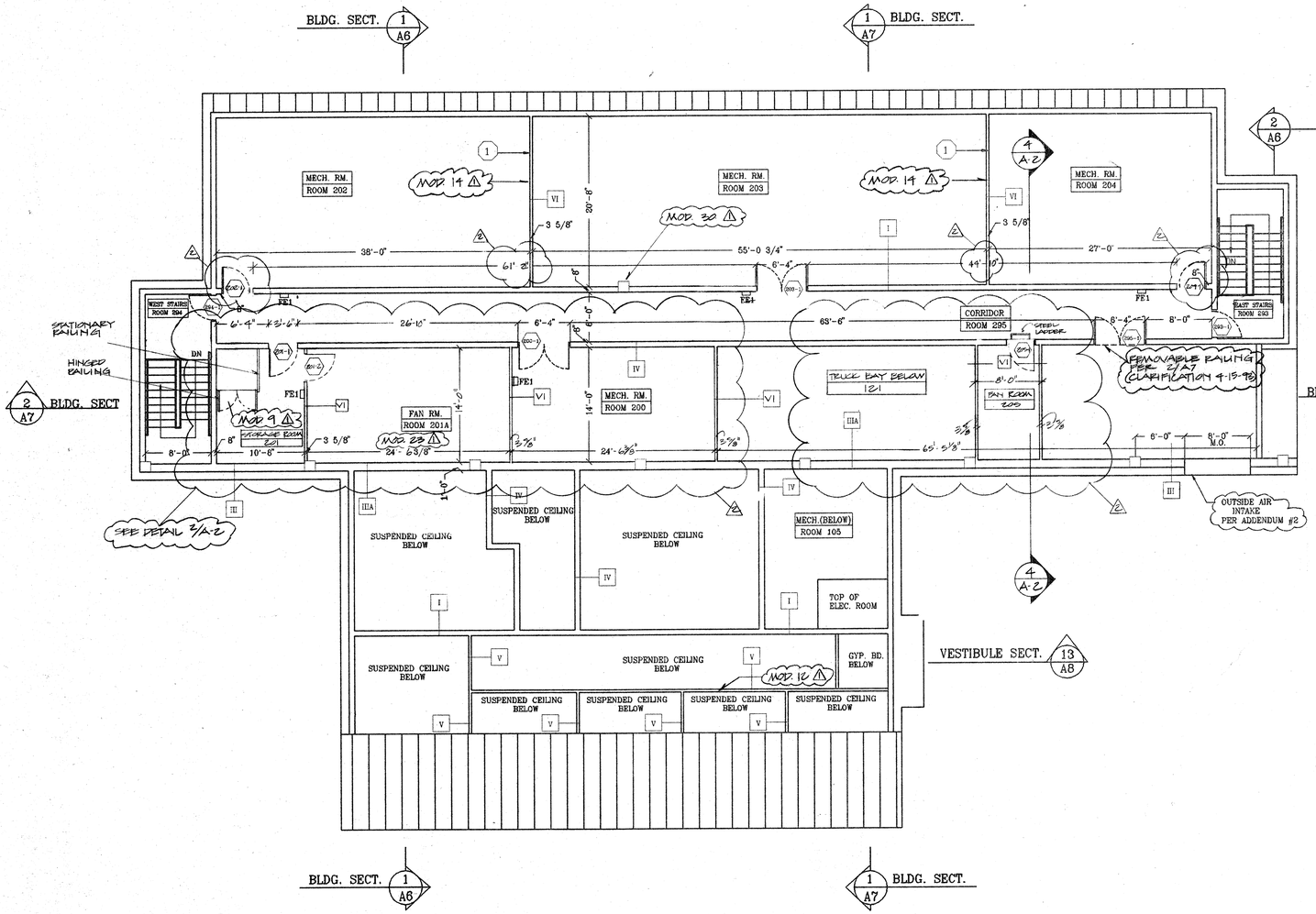
DRAWING TITLE

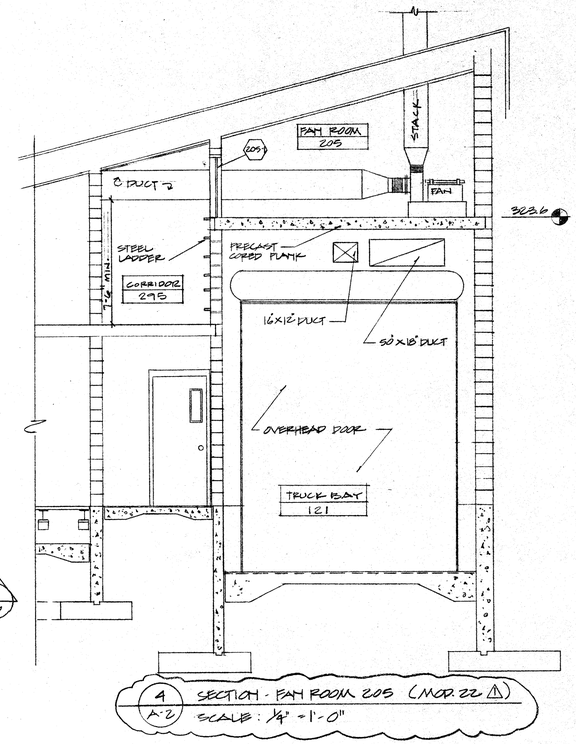
FIRST LEVEL FLOOR PLAN

DRAWING NO.

A1

CONSTRUCTION SET





4 A-2 SECTION - FAN ROOM 205 (MOD. 22)
SCALE: 1/8" = 1'-0"

1 A2 SECOND LEVEL FLOOR PLAN
SCALE: 1/8" = 1'-0"

N

NOTE (1): VERIFY ACTUAL LOCATION OF WALLS IN THE FIELD, TO COORDINATE WITH HVAC CONTRACTOR

SEE DRAWING A1 FOR FIRE EXTINGUISHERS

UNIVERSITY OF VERMONT
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PROJECT

ENVIRONMENTAL SAFETY FACILITY
667 SPEAR STREET
BUILDING 728

PROJECT NO. ENSF89020
SCALE: 1/8" = 1'-0"
DRAWN BY CRF
CHECKED BY KB
DATE: 12-01-92

REVISIONS

DATE	BY	DESCRIPTION
12/22/92	CRF	ADDENDUM CHANGES
1/19/93	JRP	MODIFICATIONS 1
6/30/94	JRP	AS BUILTS 2

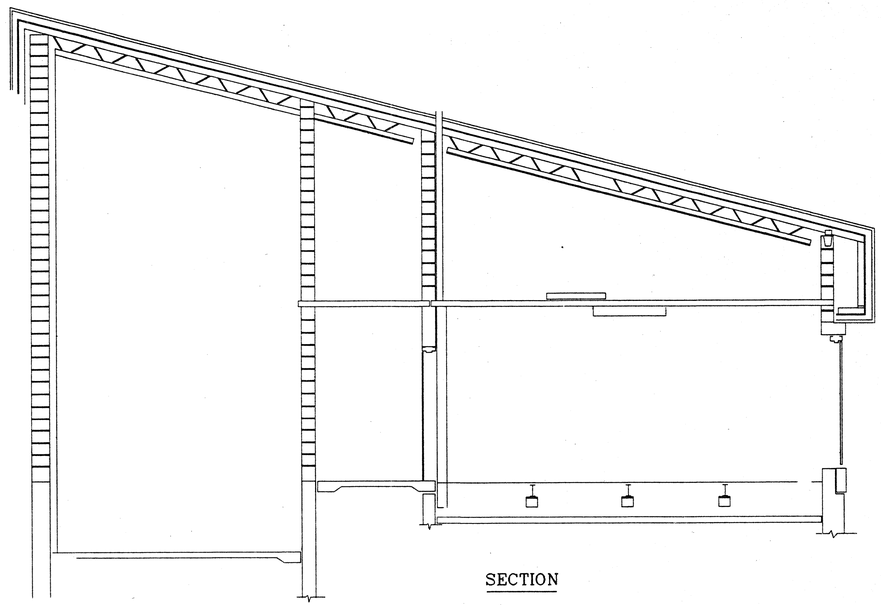
DRAWING TITLE

SECOND LEVEL FLOOR PLAN

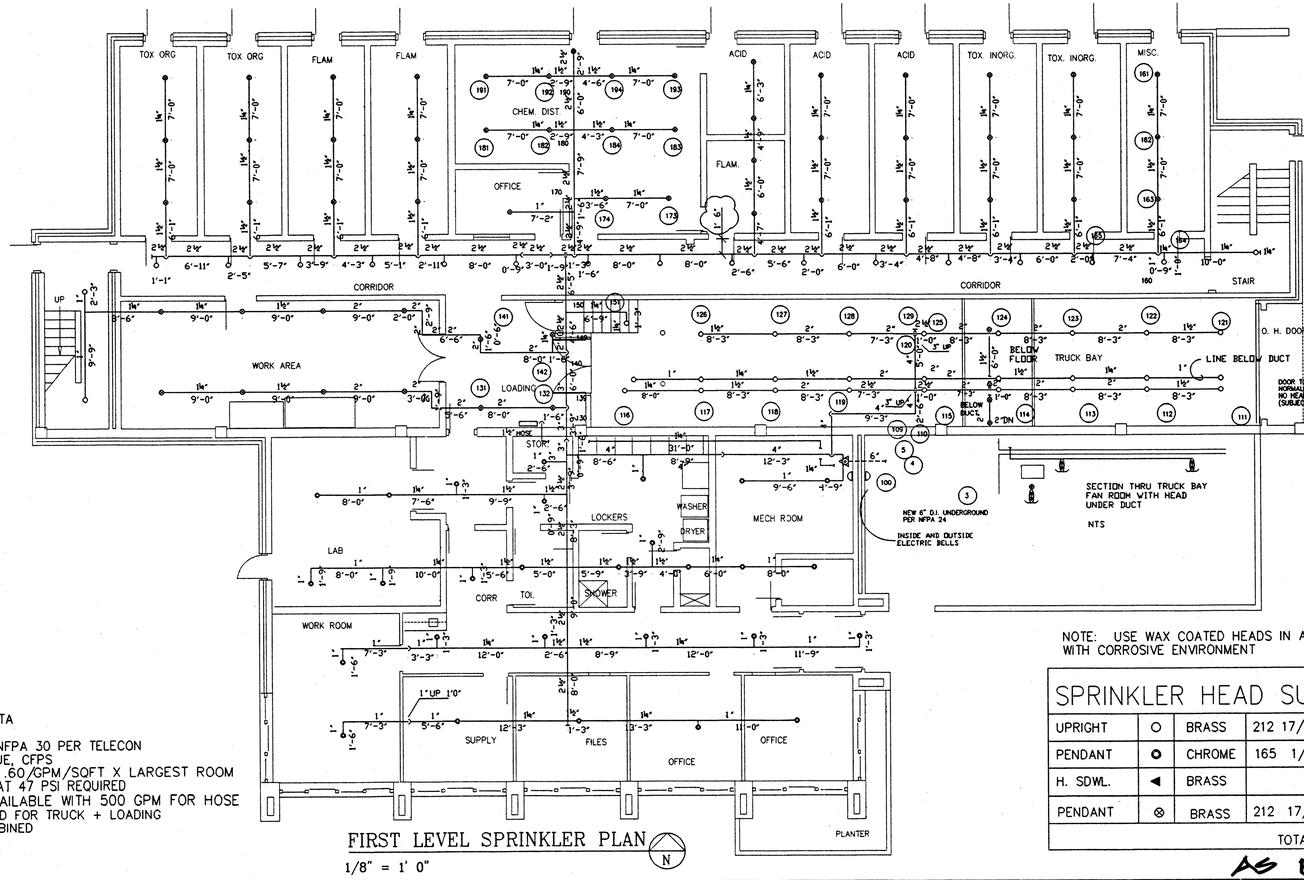
DRAWING NO.

A2

CONSTRUCTION SET

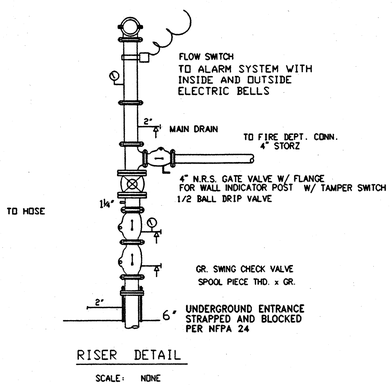


SECTION



FIRST LEVEL SPRINKLER PLAN

1/8" = 1' 0"



RISER DETAIL

SCALE: NONE

NOTES:

1. ALL MATERIALS SHALL BE U.L./F.M. APPROVED.
2. BRANCH LINE PIPING 1" TO 2" SHALL BE SCHEDULE 40 BLACK STEEL.
3. MAIN PIPING 2 1/2" AND LARGER SHALL BE SCHEDULE 10.
4. ALL PIPE AND FITTINGS PER NFPA 13.
5. ALL HANGERS PER NFPA 13, GENERALLY 3/8" CONCRETE INSERTS / C CLAMPS 3/8" THREADED ROD AND LOOP TYPE HANGERS.

DEMAND DATA

BASED ON NFPA 30 PER TELECON
TED SPRAGUE, CFPS
DENSITY: .60/GPM/SQFT X LARGEST ROOM
1360 GPM AT 47 PSI REQUIRED
53 PSI AVAILABLE WITH 500 GPM FOR HOSE
MAX DEMAND FOR TRUCK + LOADING
AREAS COMBINED

NOTE: USE WAX COATED HEADS IN AREAS WITH CORROSIVE ENVIRONMENT

SPRINKLER HEAD SUMMARY				
UPRIGHT	○	BRASS	212 17/32"	41
PENDANT	●	CHROME	165 1/2"	28
H. SDWL.	◀	BRASS		0
PENDANT	⊗	BRASS	212 17/32"	58
			TOTAL	127

AS BUILT

STATE OF VERMONT
WILLIAM R. SCOTT
No. 3821
PROFESSIONAL ENGINEER

NORTH COUNTRY FIRE PROTECTION
P.O. BOX 2004
COLCHESTER, VERMONT 05449
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Fire Protection
WILLIAM R. SCOTT, P.E.
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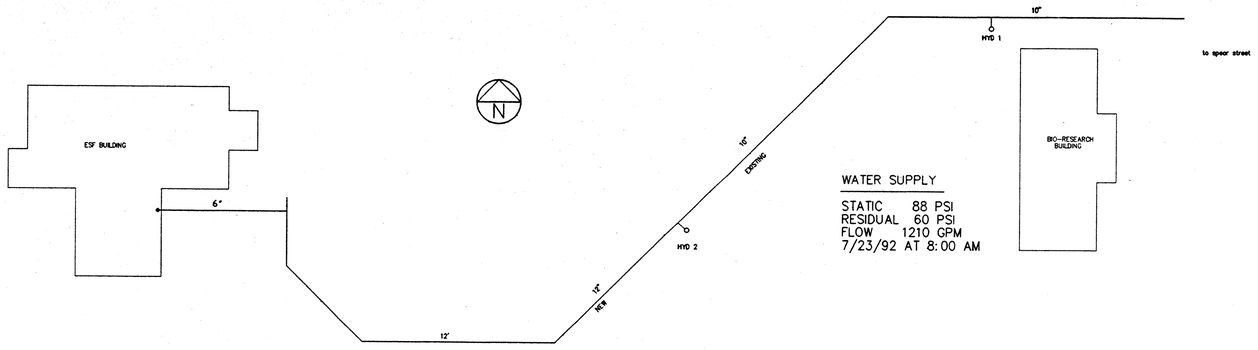
Project
ENVIRONMENTAL SAFETY FACILITY AT UVM BURLINGTON, VT

Project No. 1818
Scale AS SHOWN
Drawn by WRS
Checked by
Date 12-10-92

Revisions No.	Date	
1	12/30	ADD 4HDS BELOW DUCT
		1 1/4" OUTLET FOR HOSE
2	4/23	MOD 22 - ADD TWO HEADS
3	7/1	COORD MAIN LOCATION
4	11/1	AS BUILT

Drawing Title
FIRE PROTECTION SPRINKLER

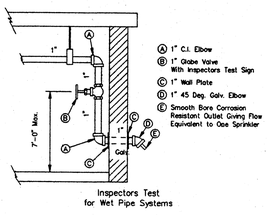
Drawing No.
FP-1



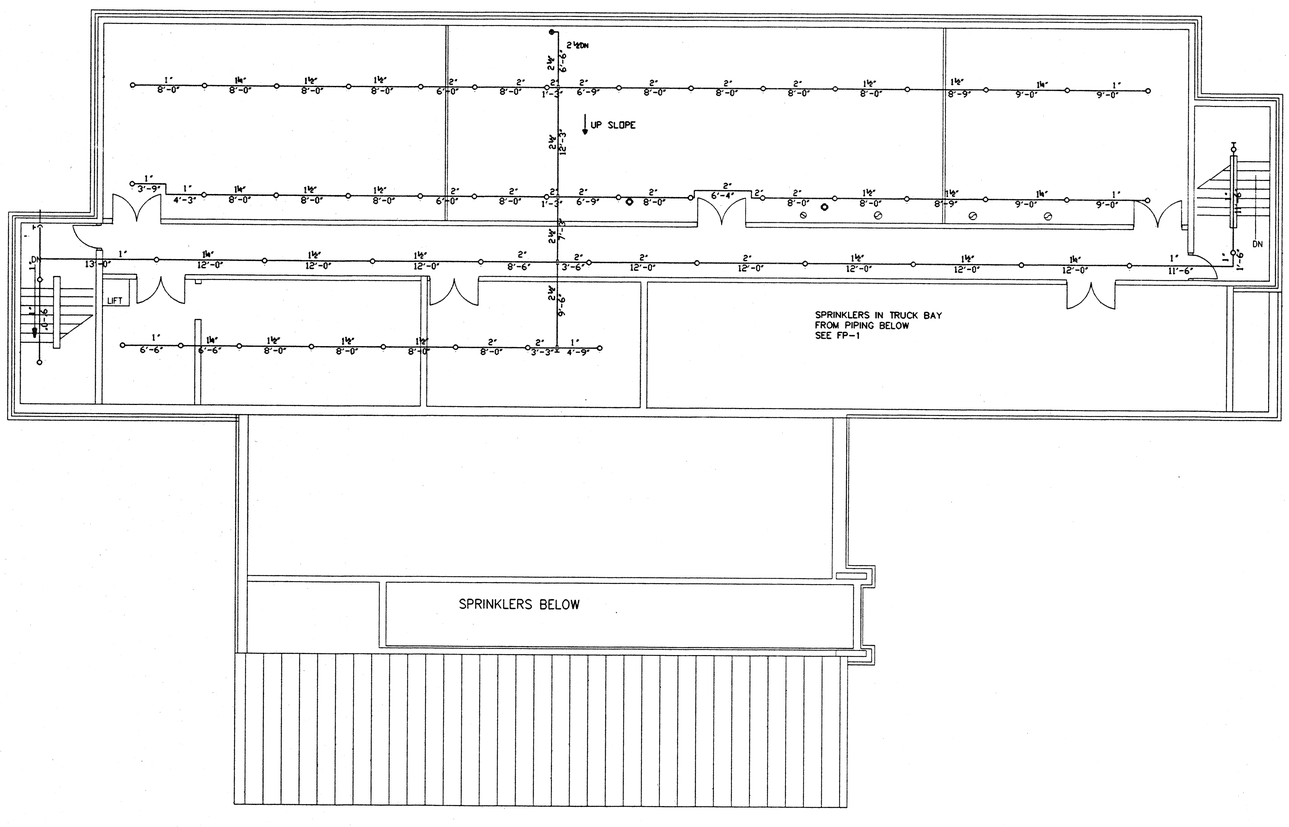
WATER SUPPLY

STATIC 88 PSI
RESIDUAL 60 PSI
FLOW 1210 GPM
7/23/92 AT 8:00 AM

SITE PLAN
NTS



Inspectors Test
for Wet Pipe Systems



SECOND FLOOR SPRINKLER PLAN
SCALE: 1/8" = 1'-0"

DESIGN DATA

ORDINARY HAZARD GROUP 1
.15 GPM/SQFT X 1500 SQFT
821 GPM AT 35 PSI REQ'D
74 PSI AVAILABLE
INCLUDES 500 GPM HOSE

SPRINKLER HEAD SUMMARY

UPRIGHT	○	BRASS	212 1/2"	50
PENDANT	◘	CHROME		0
H. SDWL.	◁	BRASS		0
			TOTAL	50

AS BUILT

STATE OF VERMONT
WILLIAM R. SCOTT
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PROFESSIONAL ENGINEER

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Project
ENVIRONMENTAL SAFETY FACILITY AT UVM
BURLINGTON, VT

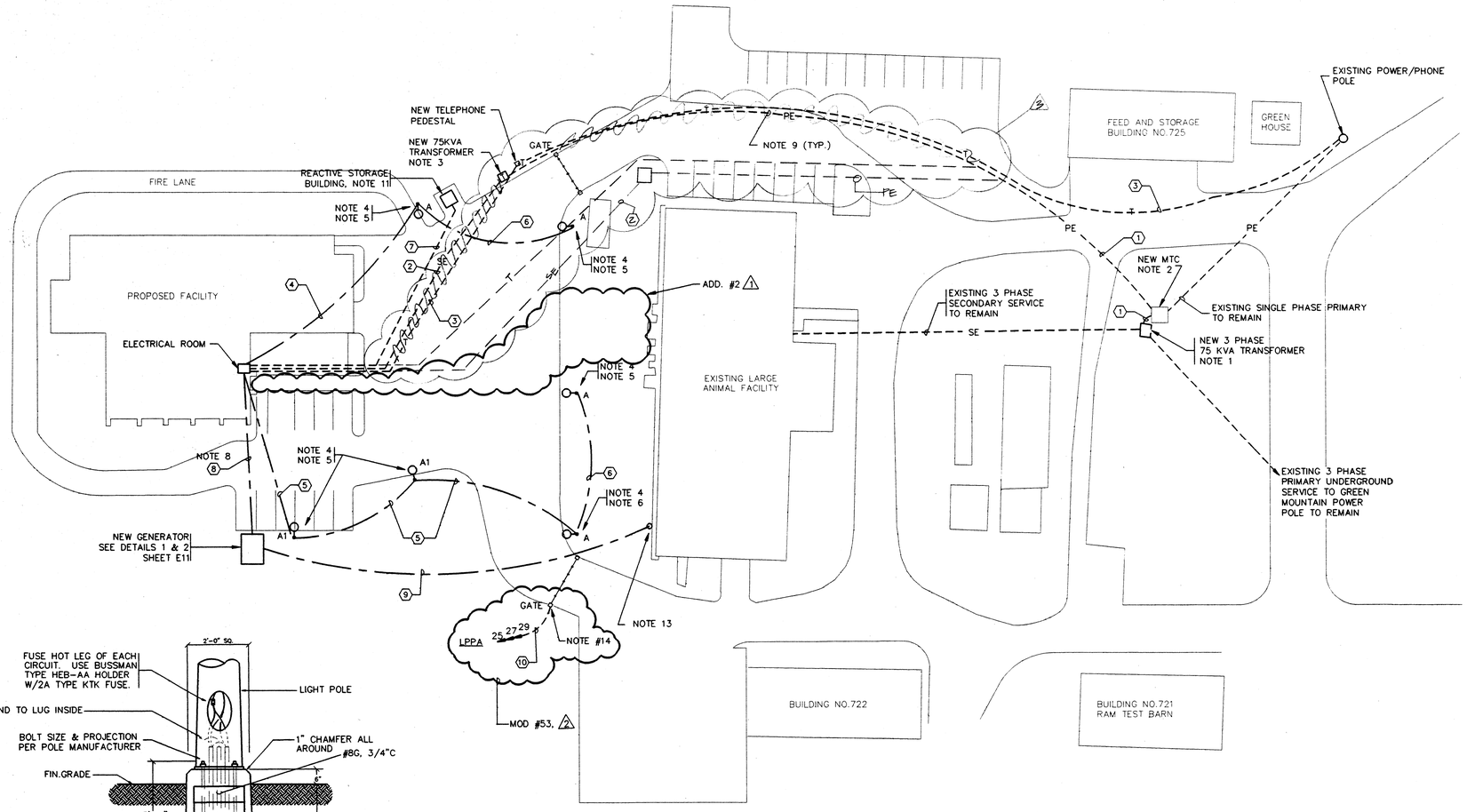
Project No. 1818
Scale AS SHOWN
Drawn by WRS
Checked by
Date 12-10-92

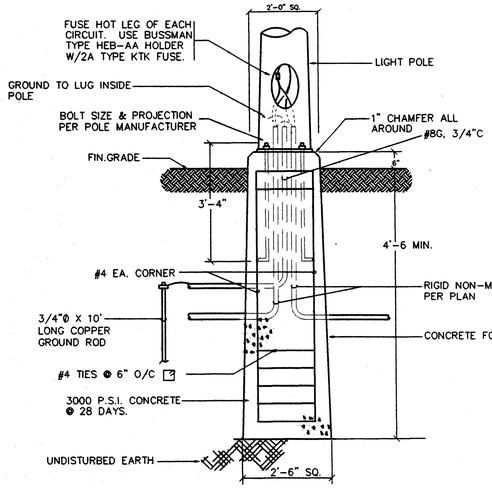
Revisions

No.	Date	
1	12/30	INSP TST - LESS BHDS TRUCK BAY
2	4/23	MOD 18
3	7/1	COORD MTG/INSP TEST,RISER
4	11/1	AS BUILTS

Drawing Title
FIRE PROTECTION SPRINKLER

Drawing No.
FP-2





LIGHT POLE BASE DETAIL
NO SCALE — A / E1

ELECTRICAL SITE PLAN
SCALE: 1" = 30'-0"

CONDUIT AND CABLE SCHEDULE

1. (2) 5"C (PRIMARY POWER)
2. SECONDARY POWER
3. (1) 4"C (TELEPHONE)
4. (2) #8, (1) #8G, 1"C
5. (4) #8, (1) #8G, 1"C
6. (2) #10, (1) #10G, 3/4"C
7. (1) 2"C (POWER),(1) 1 1/2"C (CONTROL), (1) 1"C CONTROL
8. (4) #1/0, (1)#6G, 2"C; (2)#10, (1)#10G, 3/4"C; (2) #14, (1)#14G, 3/4"C
9. (1) 3"C, (1) 1"C (FUTURE)
10. (3) #12, (1) #12G, 1/2"C
11. (2)#10, (1)#10G, 1/2"C

NOTES: (• = GENERAL NOTES)

1) EXISTING TRANSFORMER TO BE REPLACED WITH NEW 75KVA, 3 PHASE, 13,800 VAC PRIMARY DELTA– 120/208 VAC SECONDARY DEADFRONT, FEED THROUGH TRANSFORMER. REUSE EXISTING CONCRETE TRANFORMER PAD AND WELL. SEE SPECIFICATION FOR DETAILS.
2) NEW MTC TO BE INSTALLED IN PRIMARY SERVICE SYSTEM. LOCATE IN EXISTING 1 PHASE PRIMARY, SEE BLOCK DIAGRAM DETAIL 1 SHEET E9. FURNISH AND INSTALL NEW CONCRETE TRANSFORMER BASE, SEE DETAIL 2 SHEET E9.
3) NEW 75KVA, 3 PHASE, 13,800 VAC PRIMARY DELTA– 120/208 VAC SECONDARY, DEADFRONT, FEED THROUGH TRANSFORMER. SEE SPECIFICATION FOR DETAILS FURNISH AND INSTALL NEW CONCRETE TRANSFORMER BASE, SEE DETAIL 2 SHEET E9.
4) LIGHTING CONTROLLED FROM LIGHTING CONTACTOR LOCATED IN ELECTRICAL ROOM. SEE DETAIL 3 SHEET E9.
5) LIGHT FIXTURE POWERED FROM LIGHTING CONTACTOR C–1.
6) LIGHT FIXTURE POWERED FROM LIGHTING CONTACTOR C–2.
• 7) USE LONG RADIUS BENDS ON ALL UNDERGROUND CONDUIT RUNS.
• 8) SEE GENERATOR BLOCK DIAGRAM DETAIL 2, SHEET E11.
• 9) PORTIONS OF PRIMARY UNDERGROUND LOCATED UNDER PAVED AREA SHALL BE ENCASED IN CONCRETE, SEE DETAIL 5, SHEET E9.
• 10) SEE DETAIL 4 SHEET E9 FOR UNDERGROUND TRENCH DETAIL.
11) FIELD COORDINATE CONDUIT TERMINATION AT REACTIVE STORAGE BUILDING.
• 12) CONTRACTOR TO CARRY PRICE FOR INSTALLATION OF INTERCOM CONDUIT SYSTEM. REFER TO BID FORMS AND INSTRUCTIONS. INTERCOM SYSTEM COMPONENTS (ie. HANDSETS, SPEAKERS, TELEPHONE INTERFACE MODULES) ARE NOT PART OF THIS CONTRACT.
13) STUB CONDUIT 2' ABOVE FINISHED GRADE AND CAP.
14) STUB UP CONDUIT AND CABLE TO NEW ELECTRICALLY OPERATED GATE. — MOD #53, 2

LEGEND (REFER TO SPECIFICATIONS)

- PC — PHOTOCELL
- TC — TIME CLOCK
- P — PUSH BUTTON
- BMCP — BUILDING MANAGEMENT CONTROL PANEL
- LDCP — LEAK DETECTION CONTROL PANEL
- COMBINATION MOTOR STARTER/SAFETY SWITCH
- FUSIBLE DISCONNECT SWITCH
- EXIT LIGHT, WALL MOUNTED, LETTER DENOTES TYPE
- EXIT LIGHT, CEILING MOUNTED, LETTER DENOTES TYPE
- RECESSED FLUORESCENT FIXTURE, LETTER DENOTES TYPE, SMALL LETTER DENOTES SWITCH LOOP
- NL — EMERGENCY LIGHT FIXTURE (NL DENOTES NIGHT LIGHT)
- EXTERIOR POLE LIGHT
- STRIP LIGHT FIXTURE
- WALL MOUNTED LIGHT FIXTURE, LETTER DENOTES TYPE, SMALL LETTER DENOTES SWITCH LOOP
- SINGLE POLE SWITCH, "E" DESIGNATES EXPLOSION PROOF
- THREE–WAY SWITCH, "E" DESIGNATES EXPLOSION PROOF
- MOTOR SENTINEL SWITCH, "E" DESIGNATES EXPLOSION PROOF
- FOUR–WAY SWITCH, "E" DESIGNATES EXPLOSION PROOF
- DUPLEX RECEPTACLE
- DUPLEX OUTLET, GROUND FAULT TYPE
- DUPLEX RECEPTACLE, GROUND FAULT TYPE WITH WEATHERPROOF COVER
- SINGLE OUTLET, EXPLOSION PROOF
- POWER OUTLET
- DOUBLE DUPLEX COUNTER MOUNTED RECEPTS, REFER TO SPECIFICATIONS
- FACP — FIRE ALARM CONTROL PANEL
- F — FIRE ALARM MANUAL PULL STATION
- F_E — FIRE ALARM MANUAL PULL STATION, EXPLOSION PROOF
- H_E — HEAT DETECTOR, FIXED TEMPERATURE/RATE OF RISE TYPE, EXPLOSION PROOF
- H^E_F — HEAT DETECTOR, FIXED TEMPERATURE TYPE, E DENOTES EXPLOSION PROOF
- S — SMOKE DETECTOR
- S_D — DUCT MOUNTED SMOKE DETECTOR
- L — FIRE ALARM LIGHT
- HL — FIRE ALARM HORN–LIGHT COMBINATION
- HL_E — FIRE ALARM HORN–LIGHT COMBINATION, EXPLOSION PROOF
- HL_{WP} — FIRE ALARM HORN–LIGHT COMBINATION, WEATHERPROOF
- B_S — SPRINKLER FLOW BELL
- H_S — SECURITY ALARM HORN
- ∇^E — INTERCOM PHONE, "E" INDICATES EXPOLSION PROOF, NOTE 12
- ▼ — TELEPHONE OUTLET
- G — GAS SENSOR (CARBON MONOXIDE)
- SAP — SECURITY ALARM PANEL
- KB — KNOX BOX
- KP — SECURITY KEY PAD
- DS — SECURITY ALARM DOOR SWITCH
- DS_E — SECURITY ALARM DOOR SWITCH, EXPLOSION PROOF
- M — SECURITY ALARM MOTION DETECTOR
- — — PE — — UNDERGROUND PRIMARY FEEDER, NOTE 7, NOTE 9
- — — T — — UNDERGROUND TELEPHONE SERVICE, NOTE 7
- — — SE — — UNDERGROUND SECONDARY FEEDER, NOTE 7
- S^E — SPEAKER, WALL MOUNTED, "E" DESIGNATES EXPLOSION PROOF, NOTE 12
- DATA OUTLET
- T — TRANSFORMER
- MTC — MODULAR TERMINATING CABINET
- BRANCH CIRCUIT
- BRANCH CIRCUIT HOMERUN TO PANELBOARD
- BRANCH CIRCUIT BELOW GRADE OR SLAB, NOTE 7
- SURFACE RACEWAY
- FS — FUME HOOD FLOW SENSOR
- AFAM — AIR FLOW ALARM MODULE
- FUME HOOD ALARM LIGHT
- CT — CURRENT TRANSFORMER

University of Vermont
ARCHITECTURAL & ENGINEERING SERVICES
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STATE OF VERMONT — MICHAEL P. KIRICK NO. 5008 REGISTERED PROFESSIONAL ENGINEER

Consultants

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99 SWIFT ST.
So. BURLINGTON, VERMONT 05403

Project
UVM ENVIRONMENTAL SAFETY FACILITY
667 SPEAR STREET
BUILDING 728

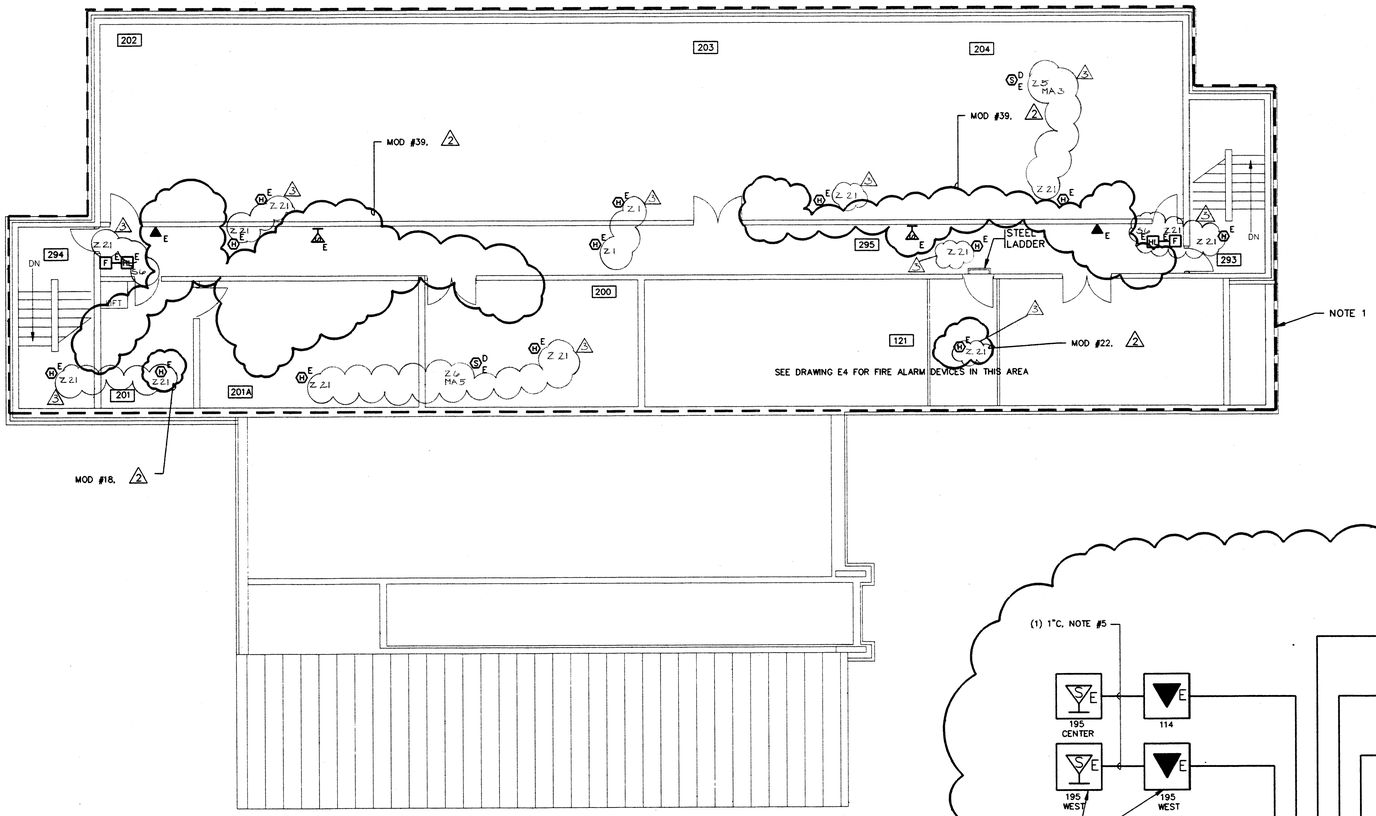
Project No. ENSF 89020 (1818)
Scale AS SHOWN
Drawn by MEB
Checked by DBM
DATE: 12/1/92

Revisions

No.	Date	
1	3/25/93	ADDENDA 1 & 2
2	4/30/93	DRAWING MODIFICATIONS
3	7/16/94	AS BUILTS JDL

Drawing Title
ELECTRICAL SITE PLAN

Drawing No.
E1



PROPOSED SECOND FLOOR PLAN - FIRE ALARM, SECURITY + INTERCOM

SCALE: 1/8" = 1'-0"

NOTE:

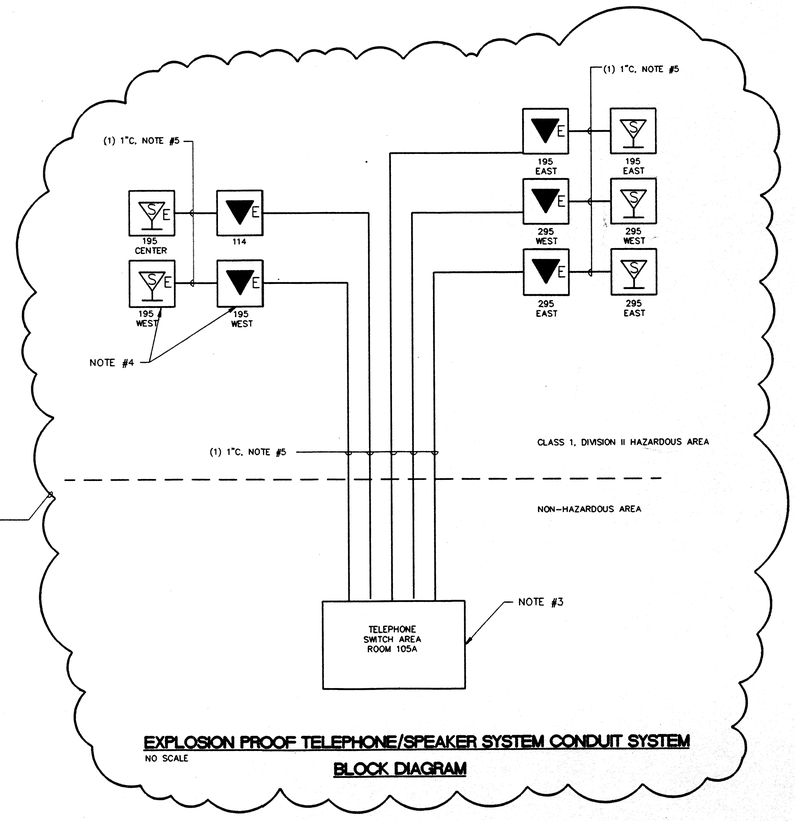
1) AREA OUTLINED BY DASHED LINE IS A CLASS 1 DIVISION 2 HAZARDOUS AREA. ALL ELECTRICAL EQUIPMENT, DEVICES, ETC. INSTALLED IN THIS AREA SHALL BE RATED FOR CLASS 1 DIVISION 2. ALL CONDUITS ENTERING THIS AREA ARE TO BE SEALED WITH EYS TYPE SEALING FITTINGS.

2) LEGEND LOCATED ON SHEET E1.

3) DROP CONDUITS DOWN WALL IN ELECTRICAL ROOM ADJACENT TO TELEPHONE SWITCH.

4) FURNISH AND INSTALL JUNCTION BOXES WHICH MATCH AND MATE WITH TELEPHONE AND SPEAKER DEVICES. COORDINATE EXACT REQUIREMENTS WITH UVM COMMUNICATIONS DEPARTMENT AND EQUIPMENT SUPPLIER.

5) INSTALL PULL LINES IN CONDUITS FOR FUTURE INSTALLATION OF CABLES.



EXPLOSION PROOF TELEPHONE/SPEAKER SYSTEM CONDUIT SYSTEM BLOCK DIAGRAM

NO SCALE

MOD #39.

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Project

UVM ENVIRONMENTAL SAFETY FACILITY
667 SPEAR STREET
BUILDING 728

Project No. ENSF 89020 (1818)
Scale AS SHOWN
Drawn by MEB
Checked by DBM
DATE: 12/1/92

Revisions

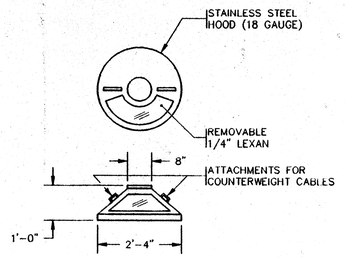
No.	Date	
1	3/25/93	ADDENDA 1 & 2
2	4/30/93	DRAWING MODIFICATIONS
3	7/15/94	AS BUILTS JDL

Drawing Title

SECOND LEVEL ALARM SYSTEMS PLAN

Drawing No.

E7



EXHAUST DROP DETAIL
SCALE: 1/2"=1'-0"

REGISTER SCHEDULE

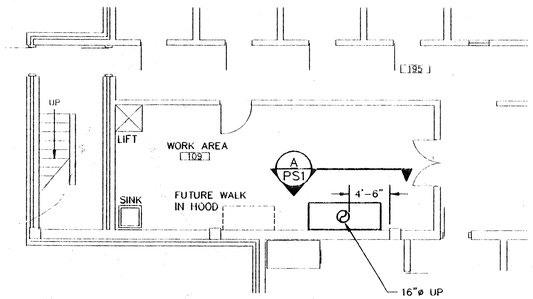
PLAN SYMBOL	DESCRIPTION	MANUFACTURER & MODEL #	SIZE	CFM	MATERIAL	NOTES
A	EXHAUST AIR REGISTER	CARNES RTRAV	24"x24"	600	STAINLESS STEEL	WITH KEY OPERATED DAMPER

EXHAUST FAN SCHEDULE

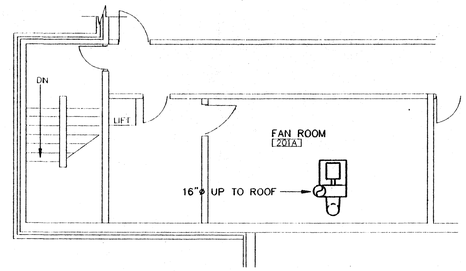
PLAN SYMBOL	DESCRIPTION	MANUFACTURER & MODEL #	CHARACTERISTICS	ELECTRIC	NOTES
EF 7	POURING STATION EXHAUST FAN	BUFFALO-FORGE SIZE 50 FRPMW	3000CFM @ 1.8" S.P., 428 RPM, W/ DRAIN CONNECTION, VIBRATION ISOLATION, BELT GUARD, FIBERGLASS REINFORCED PLASTIC CONSTRUCTION	208/3/60 2.0 HP	NEC CLASS 1 DIV 2 EXPLOSION PROOF, SPARK PROOF. SUBMIT SHOP DRAWINGS

GENERAL NOTES:

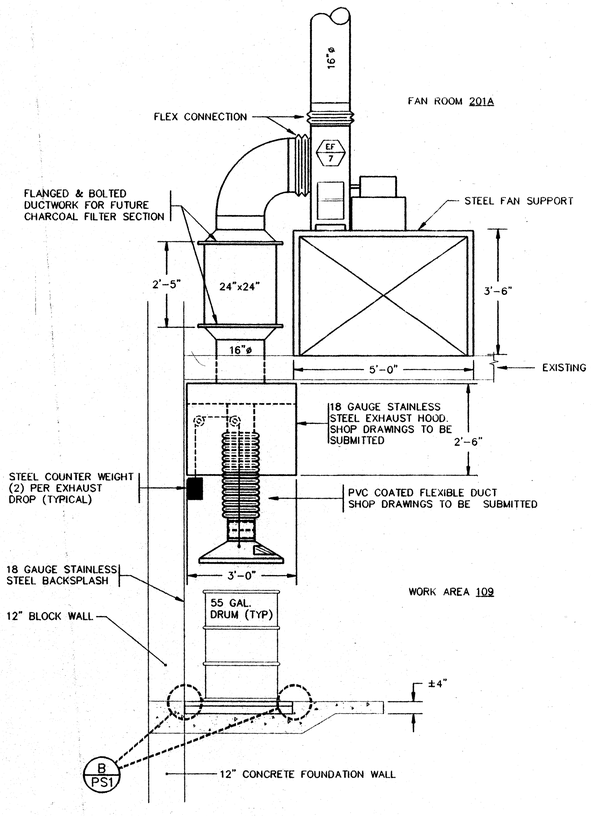
1. EF-7 TO BE MOUNTED ON VIBRATION ISOLATORS PROPERLY SIZED FOR THE WEIGHT OF THE EXHAUST FAN.
2. EXHAUST STACK TO EXTEND 10'-0" ABOVE THE ROOF PEAK.
3. PROVIDE SHOP DRAWINGS.
4. FIELD VERIFY ALL EXISTING CONDITIONS
5. ANSUL SYSTEM HEAT DETECTORS & SPRAY NOZZLES TO BE INSTALLED PER MANUFACTURERS INSTRUCTIONS. ANSUL SYSTEM TO BE LOCATED IN THE LAB (RM.69). ANSUL SYSTEM IS TO BE SUPPLIED WITH A SET OF CONTACTS THESE CONTACTS ARE TO BE USED TO SHUT DOWN FAN EF-7 UPON ACTIVATION THROUGH THE HONEYWELL CONTROL SYSTEM.



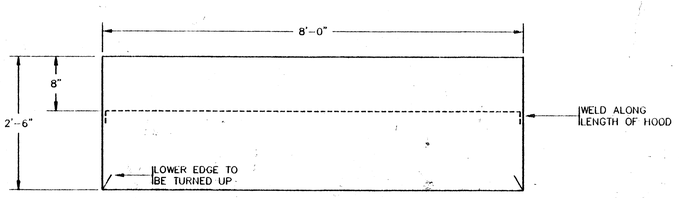
FIRST FLOOR - PARTIAL PLAN
SCALE: 1/8" = 1'-0"



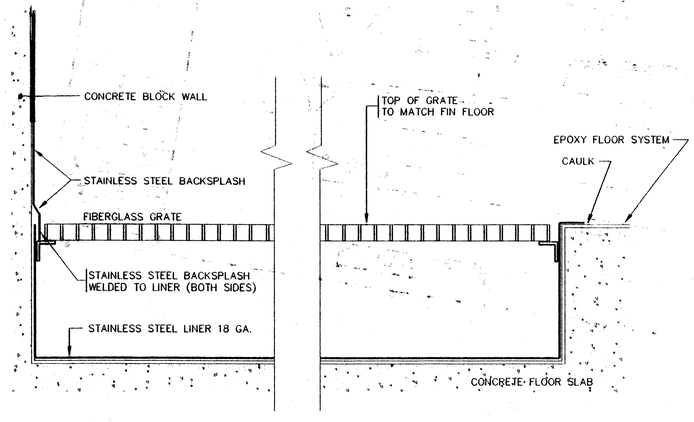
SECOND FLOOR - PARTIAL PLAN
SCALE: 1/8" = 1'-0"



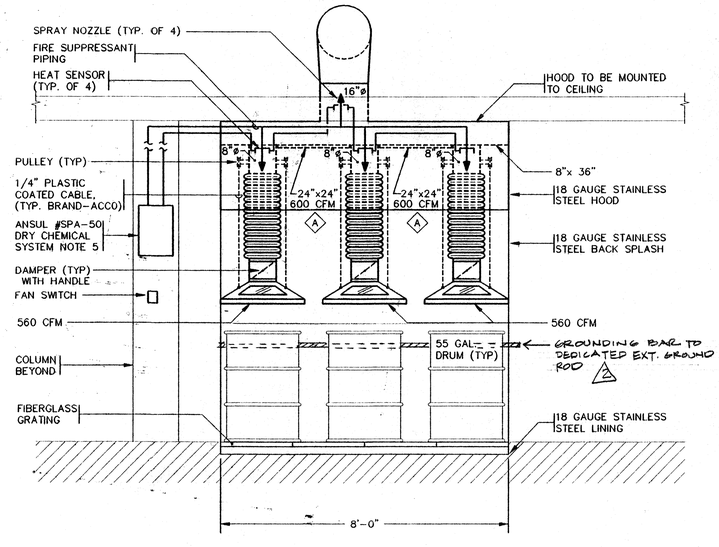
POURING STATION SECTION SIDE VIEW
SCALE: 1/2"=1'-0"



HOOD DETAIL
SCALE: NONE



LIQUID CONTAINMENT ASSEMBLY
NO SCALE
B / PS1



POURING STATION ELEVATION
SCALE: 1/2"=1'-0"
A / PS1

University of Vermont
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Project

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667 SPEAR STREET
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Project No. ENSF 89020 (1818)
Scale AS NOTED
Drawn by RHG
Checked by MVB
DATE: 08/11/93

Revisions

No.	Date	
1	8/26/93	DRAWING CHANGES
2	3/4/93	ADD GROUND BAR

Drawing Title

POURING STATION

Drawing No.

PS1

Attachment B-3

Flood Plain Certification

State of Vermont

...ment of Fish and Wildlife
...ent of Forests, Parks and Recreation
...ment of Environmental Conservation
State Geologist
Natural Resources Conservation Council

AGENCY OF NATURAL RESOURCES
103 SOUTH MAIN STREET
Waterbury, Vermont 05676

Department of Environmental Conservation

FLOOD PLAIN MANAGEMENT
10 North Building
(802) 244-6951

October 25, 1988

PROJECT ENVIRON. SAFETY FACILITY
FEAS / DES / CONST.
CLIENT A IN
EQUIP. B OUT
CONSUL.

Mr. Ken Bean
University of Vermont
Architectural and Engineering Services
107 South Prospect Street
Burlington, VT 05405-0016

Dear Mr. Bean:

Subject: Flood Plain Site Investigation

The site of a proposed University hazardous waste storage building to be located in the field south of the Ram Test Barn at the Bioresearch Complex off Spear Street is not within the 100-year flood plain of the small tributary of Potash Brook.

If this does not meet with your needs, please give me a call at 244-6951.

Sincerely,

Roy Gaffney

Roy Gaffney
Flood Plain Management

vld

ATTATCHMENT

RECEIVED
OCT 27 1988
Architectural &
Engineering Services

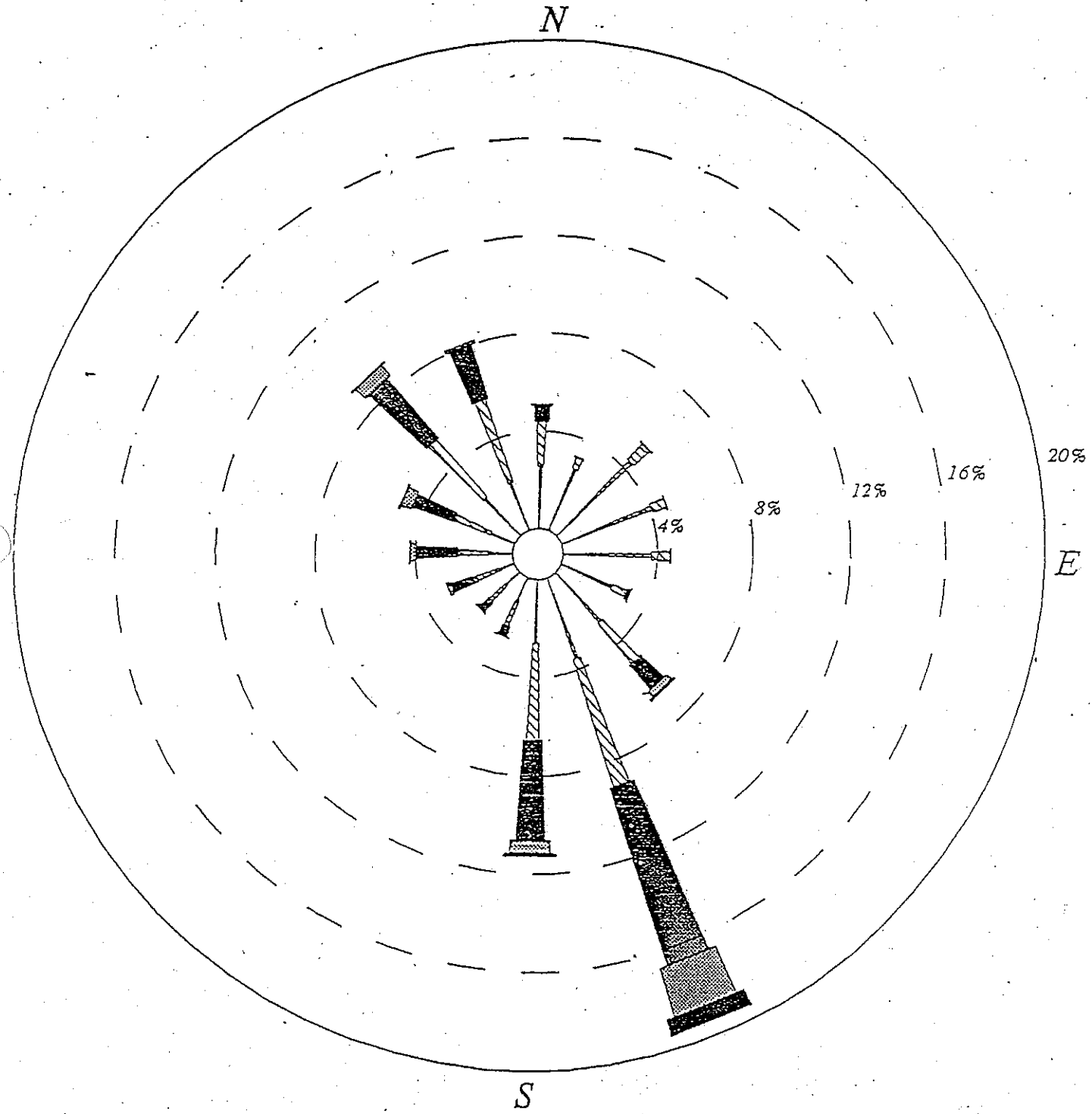
Attachment B-4

Wind Rose

FIGURE B-3 - WIND ROSE

Burlington, VT 1989

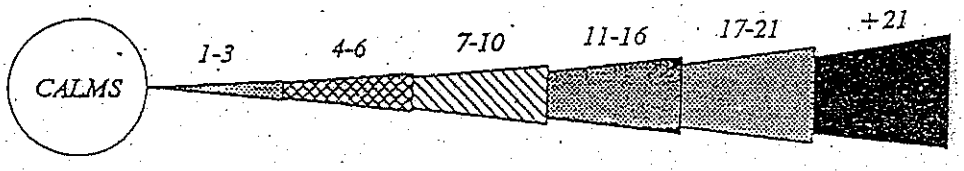
January 1-December 31; Midnight-11 PM



CALM WINDS 2.07%

NOTE: Frequencies indicate direction from which the wind is blowing.

WIND SPEED (KNOTS)



Appendix C

Hazardous Wastes Accepted

The Environmental Safety Facility (ESF) accepts all wastes generated by The University of Vermont and State Agricultural College (UVM) operations, including waste from laboratories, fleet maintenance, facilities maintenance, and other miscellaneous campus operations.

UVM has research and teaching laboratories, including art studios, in many buildings on its campuses. These laboratories handle "laboratory scale" chemicals, which means the work involves containers that can easily and safely be manipulated by one person, multiple chemical procedures or chemical substances are used, and protective laboratory practices and equipment are available and in common use to minimize the potential for employee and environmental exposures to hazardous chemicals. The wastes and leftover chemicals from these labs and studios contribute an average of approximately 65% of UVM's annual hazardous waste.

UVM maintains over 150 buildings, as well as a fleet of vehicles. Cleaning chemicals, fuels, oils, paints, and other maintenance related materials constitute an average of approximately 15% of UVM's hazardous wastes.

As part of maintaining these facilities, UVM engages in construction, renovation, and excavation projects. These projects often generate non-routine hazardous wastes such as debris from the removal of lead paint, removal of fuel storage tanks, clean up of spills, and remediation of contaminated soils. These wastes make up an average of approximately 20% of UVM's annual hazardous waste stream; however, these totals can vary greatly from year-to-year, based on the projects on campus.

Additionally, several universal waste types are generated from research, teaching, maintenance, and dormitory activities at any of UVM's campuses.

For the purposes of this permit, UVM has 10 distinct campuses:

1. Main campus (including Central, Athletic, Redstone, and Centennial campuses) in Burlington
2. Trinity campus in Burlington
3. Environmental Safety Facility (including BioResearch Center, 705 Spear Street, and Miller Education and Research Center) in Burlington and South Burlington
4. Blasberg Horticulture Research Center in South Burlington
5. Rubenstein Ecoscience Systems Lab in Burlington
6. Fort Ethan Allen (including automotive repair shop) in Essex (Essex Junction)
7. Colchester Research Facility in Colchester
8. Proctor Maple Research Facility in Underhill
9. Jericho Research Forest in Jericho and Richmond
10. Morgan Horse Farm in Weybridge (Middlebury)

UVM owns and leases properties throughout Vermont, conducts field research on lands and waters throughout the state, and maintains clinical research facilities, extension offices and administrative offices in off-campus locations. Any of the hazardous wastes, universal wastes and oil wastes generated by activities of UVM and its affiliates and tenants may be accepted at the Environmental Safety Facility. Additionally, UVM may accept waste from source generators as listed in Appendix D.

List of Hazardous Wastes Accepted

Wastes received at the ESF will be in the form of small containers that are lab packed into larger shipping containers or shipping containers that hold liquid or solid waste in bulk.

Lab packed containers may be solid, liquid, multi-phased, or compressed gas. They may contain unused product or spent reactants. These wastes are assigned a wide variety of hazardous waste codes. Bulk hazardous wastes are usually contained in 5-gallon to 55-gallon containers.

The following tables list the hazardous waste codes that can be accepted at the ESF.

EPA Hazardous Wastes

Waste Codes	Waste Description
F001	The following spent halogenated solvents generated in degreasing processes and their byproducts as noted in 40 CFR 261.31: tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1 trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons.
F002	The following spent halogenated solvents and their byproducts as noted in 40 CFR 261.31: tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1 trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, o-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichlorethane.
F003	The following spent non-halogenated solvents and their byproducts as noted in 40 CFR 261.31: xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol.
F004	The following non-halogenated solvents and their byproducts as noted in 40 CFR 261.31: cresols, cresylic acid, and nitrobenzene.
F005	The following spent non-halogenated solvents and their byproducts as noted in 40 CFR261.31: toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, and 2-nitropropane.
F027	Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulation containing compounds derived from these chlorophenols.
D001	Wastes exhibiting the characteristics of ignitability as defined in 40 CFR 261.21
D002	Wastes exhibiting the characteristics of corrosivity as defined in 40 CFR 261.21
D003	Wastes exhibiting the characteristics of reactivity as defined in 40 CFR 261.21
D004 - D043	Wastes exceeding the maximum concentration as defined when tested in accordance with 40 CFR 261.24
All “P”& “U” Listed Wastes	Waste that are specifically listed in VHWMR 7-214 and 7-215 or 40 CFR 261.33

Vermont Wastes

Waste Codes	Waste Description
VT01	Wastes containing polychlorinated biphenyls in concentrations equal to or greater than 50 ppm
VT02	Waste containing greater than 5% by weight of petroleum distillates with melting points of less than 100 degrees F, including but not limited to kerosene, fuel oil, hydraulic oils, lubricating oils, penetrating oils, tramp oils, quenching oils, and crankcase and automotive oils which have not been exempted under Section 7-203(n), (o), and (p).
VT03	Waste water soluble oils which have not been exempted under Section 7-203 (1)
VT06	Pesticidal wastes and obsolete pesticidal products not specifically listed otherwise in Subchapter 2.
VT08	Waste ethylene glycol based coolants, antifreezes, solutions containing greater than 700 ppm of ethylene glycol.
VT11	Wastes determined to be hazardous under provisions of Section 7-213 or 7-216
VT20	A solid material that when mixed with an equal weight of distilled water causes the liquid fraction of the mixture to exhibit the properties of the corrosivity characteristic as specified under Section 7-206(a)(3).
VT99	Non-hazardous waste.

Low-Level Mixed Wastes

Low-Level Mixed Waste (LLMW) generated by UVM may be received and stored at the ESF. LLMW is waste that contains both a RCRA hazardous waste and a low-level radioactive waste as defined in 40 CFR §266.210. This waste may be exempt from RCRA hazardous waste determination in accordance with Vermont Hazardous Waste Management Regulations §7-203(f) and 40 CFR §266.230. LLMW that is exempted will be managed under UVM's Vermont Department of Health Radioactive Materials License #: 44-00728-13.

RCRA Waste Codes included in this exemption: D001, D002, D003, D008, D022, F001, F002, F003, F004, F005, VT01, VT02.

List of Universal Wastes to be Accepted

Universal waste generated from activities at UVM may be accepted at the ESF.

"**Universal waste**" means any of the following hazardous wastes that are subject to the universal waste requirements of Vermont Hazardous Waste Management Regulations (VHWMR):

(a) Batteries as described in VHWMR § 7-902, generated from equipment throughout campus
(b) Pesticides as described in VHWMR § 7-903, generated from UVM farms, greenhouses, and research operations
(c) Thermostats as described in VHWMR § 7-904, generated from maintenance operations and equipment disposal.
(d) PCB-containing fluorescent light ballasts as described in VHWMR § 7-905, generated

from maintenance operations and equipment disposal

(e) Lamps as described in VHWMR § 7-906, generated from maintenance operations and equipment disposal

(f) Mercury-containing devices as described in VHWMR § 7-907, generated from maintenance operations and equipment disposal

(g) Cathode ray tubes (CRTs) as described in § VHWMR 7-908, generated from equipment disposal.

(h) Postconsumer paint as described in VHWMR § 7-909, generated from maintenance operations and campus projects

(i) Aerosol cans as described in VHWMR § 7-910, generated throughout campus

Appendix D

Source Generators

UVM Source Generators

The University of Vermont and State Agricultural College's (UVM) Environmental Safety Facility (ESF) is permitted to accept waste from the following generators:

- The UVM facilities, operations, or activities;
- UVM tenants and affiliates operating at UVM facilities, that have either been issued a temporary or permanent EPA Identification Number or have a written agreement with UVM to have their waste managed by UVM;
- Very small quantity generators within the City of Burlington who have been issued a temporary or permanent EPA Identification Number;
- The Chittenden County Solid Waste District, as well as very small quantity generators who have been issued a temporary or permanent EPA Identification Number and households within the district; or
- Primary and secondary educational institutions, in the State of Vermont, who have been issued a temporary or permanent EPA Identification Number.

Appendix E

Process Information and Container Management Plan

Process Information and Container Management Plan

Receiving Containers of Waste at the ESF

Wastes shipped to the University of Vermont and State Agricultural College's (UVM) Environmental Safety Facility (ESF) are accompanied by a hazardous waste manifest (manifest) or a standard bill of lading (BOL). As the ESF is a permitted captive hazardous waste storage facility for UVM and performs no disposal operations, Land Disposal Restriction notifications do not accompany shipments from UVM personnel. Land Disposal Restriction notifications are required for hazardous wastes shipped from non-UVM generators. Wastes are transported in appropriate containers (see Appendix E4 for a list of container compatibilities) to the ESF from the University in a hazardous waste permitted vehicle. The waste containers are unloaded from the truck into the building at the loading dock using the hydraulic dock leveler, if necessary. The waste containers are moved into the waste storage rooms after being unloaded from the truck.

Hazardous and Non-hazardous Labeling and Inventory

ESF uses a waste inventory and tracking system to communicate:

- waste information as described in Appendix I: Waste Analysis Plan,
- inventory, tracking, and labeling of waste containers, and
- tracking of waste during consolidation and repackaging, as described in this Appendix.

Individual waste container information is entered into an online waste database. This information follows the waste from the point of generation on UVM's campuses through the waste management process to the ESF. Non-UVM waste accepted at ESF is entered into the online database upon arrival at the ESF.

Upon receiving hazardous and non-hazardous wastes, ESF personnel input container information into the waste database, and container labels are printed. These labels include generator information, container identification, and waste information. Printed labels are affixed to the containers to replace the labels affixed to the container upon receipt. ESF personnel verify the new label is consistent with the original label. All container labels meet the container markings required in VHWMR § 7-311(f). Each container is issued a unique container number, which is used for waste tracking and inventory purposes.

The database can produce a complete inventory of all wastes stored in any room at the ESF. ESF personnel check the physical inventory in accordance with the Inspection Plan (Appendix J). For each container the waste database can report its location in the ESF, content information as reported in the online system, and the ESF arrival date.

Non-hazardous wastes are managed in the same manner as hazardous waste except that the label states "Non-Hazardous Waste."

Florescent Lamp Labeling and Inventory

Upon receiving spent florescent lamps at the ESF, personnel count and repack the bulbs into similar types. Due to the variability in frequency and volume, lamps awaiting repack may be temporarily stored in Room 109 of the facility. Lamps are counted and packaged in cardboard containers. When a new container is started, it is labeled with a "Universal Waste Lamps" sticker. When the containers are full, the box is sealed with packing tape to prevent unintentional opening during transport. Each time lamps are added, the paper inventory is updated. The inventory is kept on the door of the storage room and contains information regarding the type of lamp, type of container and number of containers currently in storage. Both the inventory and the container label have storage dates recorded on them to ensure no container is stored longer than one year.

ESF Operations: Consolidate, Repack, and Treat

To mitigate costs and facilitate disposal, ESF personnel consolidate, repack, and treat hazardous and non-hazardous wastes at the ESF. Details are these processes are described below.

Waste Consolidation - Labeling and Inventory

At the ESF, some wastes are consolidated, according to their chemical compatibility, to help reduce waste costs and facilitate disposal. New containers used for consolidation are entered into the online waste database with a unique container number and properly labeled. Wastes that are consolidated are tracked into the new container using the online waste database. Containers that are emptied through the process of consolidation are removed from the inventory, but the tracking history remains available in the online waste database.

When waste consolidation is complete, containers are transported to their appropriate storage room and a complete container inventory is generated.

Repackaging of Lab Packs – Labeling and Inventory

At the ESF, lab packs may be repackaged to meet the requirements of regulations or end disposal facilities, and to lower costs. If a new lab pack container is entered into the online waste database, a new label is printed, that includes a unique container number, and is affixed to the container. Lab packed wastes are tracked into the new container using the online waste database. Containers that are emptied through the process of repackaging are removed from the inventory, but the tracking history remains available in the online waste database.

When waste repacking is complete, containers are transported to their appropriate storage room and a complete container inventory is generated.

Treatment – Methods, Labeling, and Inventory

At the ESF wastes may be treated in the following way: 1) compaction for consolidation; 2) puncturing aerosol cans; 3) gases captured or liquefied, and 4) stabilization of reactive compounds. The following are procedures for each of these methods.

Compaction for Consolidation

ESF personnel compact waste to minimize its total volume saving raw materials (drums, liners etc.), energy and lowering disposal costs. Some examples of wastes that are compacted include:

- plastic contaminated with lead paint chips,
- empty waste containers, and
- paper towels containing trace amounts of mineral spirits.

Compaction is performed using the hydraulic crusher located in Room 109, the mixing room. Wastes are compacted and consolidated into a new container. Procedures for labeling and inventorying the waste containers is the same as listed in the "Consolidation – Labeling and Inventory" section of this Appendix.

Puncturing Aerosol Cans

ESF personnel who puncture aerosol cans follow a written procedure detailing how to safely puncture and drain aerosol cans. This includes the proper assembly, operation, and maintenance of the unit, segregation of incompatible wastes, and proper waste management practices to prevent fires or releases.

All puncturing and draining activities utilize a device specifically designed to safely puncture aerosol cans and effectively contain the residual contents and any emissions thereof. The emptied aerosol cans are sent for metal reclamation. The captured contents are labeled and inventoried following the same procedures as those listed in the "Consolidation – Labeling and Inventory" section of this Appendix.

Not all waste aerosols cans are punctured. Some are collected and managed as universal waste. This determination is made based on the contents and classification of the aerosol cans.

Management of Compressed Gas Cylinders

Cylinders containing unwanted and unused gases and liquefied compressed gases are occasionally generated as a result of teaching and research activities. Prior to off-site disposal, it is sometimes prudent to transfer these compressed gases from the cylinders into containers of compatible liquid solvents or into filters (e.g., carbon filter).

The recontainerization of the compressed gas is performed by specialists who are trained to handle cylinders and chemicals; these specialists may include outside contractors. Prior to conducting this treatment activity, notice will be provided to the Secretary that meets the information requirements of "The Treatment of Hazardous Waste in Containers or Tanks by Generators," VHWMR 7-502(o), and a site-specific health and safety plan will be developed.

Stabilization of Reactive Compounds

Reactive wastes such as unstable peroxide formers and nitro-compounds should be stable prior to being received at the ESF. However, in the case where stabilization is required prior to shipment off-site, compounds will be stabilized by means of remote or safe opening and then wetting with water or appropriate solvent at the ESF. This stabilization process will be performed with all appropriate safety measures in place and specialized contractors trained to stabilize reactive materials will be utilized, as appropriate. Prior to conducting this treatment activity, notice will be provided to the Secretary and a site specific health and safety plan will be developed.

Movement and Storage of Waste Containers within the ESF

Upon receipt at the ESF, all waste containers are moved to storage rooms, based on compatibility.

All hazardous, non-hazardous, and universal wastes at the ESF are stored in appropriate containers (see Attachment E-4) that maintain structural integrity and are compatible with the contents of the container.

All containers are kept closed during storage except when necessary to add or remove waste (e.g., consolidation). Containers holding waste will not be opened, handled, or stored in a manner that may rupture the container or cause it to leak. Containers will be placed in storage areas in such a way that at least 24 inches of aisle space will be maintained.

Containers may be stacked no higher than the equivalent height of two stacked 55-gallon drums. Stacking will only take place as long as the containers are stable, the integrity of the containers is not impaired, the appropriate markings are visible for inspection, and the required aisle space is maintained.

Containers of hazardous wastes are transported throughout the ESF on drum carts, flat bed carts, service carts with shelf sides, or other appropriate means.

Reactive wastes (air reactive, water reactive, high-energy compounds, etc.) are stored in their original containers and lab packed or overpacked into appropriate DOT-rated containers. Most of these containers are stored in the Reactives Storage Building; air-reactive materials that are packed in water may be stored in the main ESF building to prevent the water from freezing. No more than eight (8), 55-gallon drums or the equivalent of reactive and water-reactive wastes will be stored in the Reactives Storage Building. The maximum manufacturer's suggested capacity for this building is twelve (12), 55-gallon drums.

Transport to Off-Site TSDFs

All hazardous waste removed from the ESF will be transported to permitted TSD facilities. Hazardous wastes leaving the ESF for off-site treatment, storage, and disposal may be staged within the workroom prior to shipment. Staging in the corridor is allowed for no more than 24

hours. Drums and containers are staged according to the line items on the manifest or according to the destination site's accepted waste information profiles.

All hazardous wastes transported from the ESF will be packaged in accordance with DOT regulations as set forth in 49 CFR §172 and §173. Containers are loaded onto vehicles destined for off-site treatment, storage, or disposal with the aid of the hydraulic loading dock leveler, located at the end of the truck bay. All hazardous waste shipped from the ESF will be transported by Vermont permitted hazardous waste haulers in vehicles permitted for hazardous waste hauling.

Wastes in Storage for Longer than 1-Year

Under 40 CFR §268.50, the ESF is allowed to store hazardous wastes for up to one year. In some instances, storage beyond one year is necessary for the purpose of accumulating such quantities of hazardous waste to facilitate proper recovery, treatment, or disposal. ESF personnel document all containers of waste that are stored at the ESF for more than one year. Such documentation will include the reason for storage of the waste as well as the intended fate of the container. Examples of this documentation are listed in Attachment E-2 of this Appendix; additional documentation letters may be created as needed.

Personal Protective Equipment

ESF personnel wear appropriate levels of personal protective equipment (PPE) to control the risks associated with handling hazardous materials. Attachment E-1 includes a list of the PPE associated with specific ESF operations.

Prevention of Hazardous Release to the Environment

Precautions to Prevent Accidental Ignition or Reaction of Ignitable, Reactive, or Incompatible Wastes

The UVM Environmental Safety Facility has the following precautions in place to prevent accidental ignition or reaction of ignitable, reactive, or incompatible wastes:

- Only compatible materials are stored together in each of the waste storage rooms.
- All lights, switches, fans, and other electrical devices in the areas where hazardous wastes are stored are intrinsically safe to guard against fire or explosion caused by sparks.
- There are separate ventilation systems for the East and the West waste storage rooms.
- Each room is ventilated above and below the floor grate to prevent a buildup of fumes.
- The storage areas are constructed of 2-hour fire rated concrete block with 1½-hour fire rated doors to meet the building code requirements for Type H (Hazardous) Occupancy rating of this building.
- The facility is protected by a wet sprinkler system connected to the Champlain Water District water main. The alarm systems are supervised 24 hours a day by the University's Physical Plant and Police Services Departments at a central monitoring station on the main campus.

- Water-reactive and air-reactive wastes are stored in a separate, appropriately labeled, building designed for reactive storage.
- Drums of bulk ignitable wastes are grounded during consolidation at the pouring station and in the storage rooms.
- Before co-mingling, samples of the wastes to be co-mingled are combined in a smaller container at the pouring station to ensure that the wastes are compatible.
- Non-ferrous, spark-proof tools are used when appropriate.
- The facility has ABC fire extinguishers accessible throughout the building as well as a Class D extinguisher for use on flammable metal fires.
- Smoking is not allowed anywhere within the facility fence line. "No smoking" signs are prominently displayed throughout the facility, including exterior doors to waste storage areas.
- All ESF personnel are trained in the appropriate emergency response procedures and there is an emergency response drill conducted annually as part of the emergency response training refresher course.
- Daily inspections reduce the likelihood of a potentially dangerous incident developing. Any noted deficiencies to any of the emergency and fire protection equipment discovered during the daily inspections are corrected as soon as possible.
- UVM Police Services regularly patrol the area during nights, weekends, and holidays.

Secondary Containment System Design and Operation

The waste storage rooms are designed and operated to provide the secondary containment system at the ESF; design specifications for each room are found in Attachment E-3 of this Appendix. The floor of each room is constructed of a removable, epoxy-coated fiberglass grate that allows any spilled material to fall into a ventilated sump area. Each sump measures approximately 21.5 feet by 8.5 feet (same footprint as the storage room) by 2 feet in depth.

1. The floor and walls of each sump are constructed of epoxy-coated concrete and the joints are filled with non-shrink grout. This creates a base that underlies the containers which is free of cracks or gaps and is sufficiently impervious to contain leaks and spills until the collected material is detected and removed. Appendix J (Inspection Plan) contains an inspection plan to ensure that the sump areas are free of visible cracks and gaps.
2. The floor of each sump is sloped to the center of the sump/room. The removable, epoxy-coated fiberglass grate elevates the waste containers approximately 2 feet above the base, protecting them from contact with accumulated liquids.
3. The capacity of the sump in each room is equal to the volume of all the drums (20 x 55 gallons =1,100 gallons) plus 20 minutes of fire sprinkler flow. The containment system has sufficient capacity to contain 10% of the volume of containers that could be stored in the room. Furthermore, the threshold at the emergency exit door of each room is 8 inches higher than the door into the hallway; in the event of a catastrophic release, the materials would overflow into the building instead of to the exterior.
4. The roof and walls of the ESF prevent run-on into the containment system.
5. The removable floor grates allow for timely removal of spilled or leaked waste from the sump/containment area as necessary to prevent overflow of the collection system.

A containment sump is located below the loading dock leveler in the truck bay to contain a spill within the building should occur at this transfer point. The control valve for the containment sump is maintained in a closed position.

The Reactives Storage Building contains a 6-inch deep sump area located below the grated floor with capacity to store 250 gallons of material below the floor level at which waste is stored. In addition, all reactive hazardous wastes stored in this building are in individual containers that are lab packed or over-packed into appropriate DOT-rated shipping containers that serve as secondary containment.

In accordance with 40 CFR§264.15, a written schedule for inspecting equipment and devices that are important to preventing, detecting, or responding to environmental or human health hazards is included in Appendix J.

Leaking Containers

If a container is found to be leaking, the contents of the container will be transferred into an appropriate container, or the leaking container will be overpacked into an appropriate overpack container. Any material that has leaked will be absorbed using an appropriate absorbent material (e.g., Speedi-Dri, absorbent pads, etc.). Hazardous waste spill debris will be placed in appropriate containers, sealed, labeled, stored in an appropriate storage room, and ultimately transported off site to a certified TSDF.

Control of Stormwater

The ESF is elevated above the surrounding area and enclosed by a drainage ditch that leads to a water retention pond to prevent run-on from outside the facility and run-off from within the facility. There is a subsurface drainage system outside along the north side of the building adjacent to the waste storage rooms to divert rain and snow water away from the facility.

Removal of Accumulated Liquids from Containment System

Any liquids, from spills, leaks, etc., which accumulate within the ESF, will be removed immediately upon detection as soon as possible through standard spill response practices. The ventilated sump areas in each waste storage room are easily accessible by removing the epoxy coated grated floors. All spill and cleanup materials that are removed from the sumps will be assumed to be hazardous waste and managed accordingly. Materials from a known waste container will be disposed of according to requirements and standards necessary for that waste type. Materials from an unknown source will be containerized and handled as an unknown waste (Appendix I).

The truck bay is designed to drain to the containment sump where spilled materials could be pumped out of the building. The control valve for the truck bay containment sump is maintained in the closed position and opened only for the following non-emergency uses:

- Snowmelt from vehicles in the truck bay is drained into the retention pond via the containment sump.
- City water generated from flushing safety showers and eye wash stations may be discharged into the drain leading to the containment sump and released into the retention pond. This material also may be discharged into the sanitary sewer system.
- City water used to hose down ordinary dirt and grit from the truck bay floor is discharged into the drain leading to the containment sump and into the retention pond.

The retention pond is equipped with a manual release valve that is maintained in a closed position. When necessary, ESF personnel open the valve to drain the pond to control mosquitoes and drain excess water. After draining, the pond valve is returned to the closed position. The pond valve is inspected weekly.

Attachment E-1

Personal Protective Equipment Minimum Requirements

University of Vermont Environmental Safety Facility
Personal Protective Equipment Minimum Requirements

Task	PPE Level	Body Protection	Eye/Face Protection	Respiratory Protection	Foot Protection	Hand Protection	Head Protection	Hearing Protection
Delivering Chemicals	D	Work Uniform*	Safety Glasses	None	ANSI or ASTM-approved footwear	Nitrile gloves	None	None
Collecting Chemical Waste	D	Work Uniform	Safety Glasses	None	ANSI or ASTM-approved footwear	Nitrile gloves	None	None
Bulking Chemicals (Pourer and Assistant)	C	Tychem Coveralls (or equivalent)	Full-face cartridge respirator		ANSI or ASTM-approved footwear	Inner: Nitrile gloves; Outer: Neoprene (or other compatible) gloves	None	None
Lab-Packing	D	Work Uniform	Safety Glasses	None	ANSI or ASTM-approved footwear	Nitrile gloves	None	None
ESF Inspections	N/A	none	Safety Glasses	None	Closed-toe shoes	None	None	None
Lab Visits	N/A	none	Safety Glasses	None	Closed-toe shoes	None	None	None
Biowaste handling	D	Work Uniform	Safety Glasses	None	ANSI or ASTM-approved footwear	Nitrile gloves	None	None
Moving Drums	D	Work Uniform	none	None	ANSI or ASTM-approved footwear	Leather/Cotton gloves	None	None
Performing Lab Tests	D	Work Uniform	Safety Glasses	None	ANSI or ASTM-approved footwear	Nitrile gloves	None	None
Outdoor work	D	Work Uniform	Safety Glasses	None	ANSI or ASTM-approved footwear	Leather/Cotton gloves	Hard Hat, if necessary	As needed
Spill Clean-up	C - D	To be determined by emergency coordinator on-site						

*"Work Uniform" includes UVM issued 100% cotton shirts and 100% cotton pants or UVM issued lab coat.

These recommendations are made based on hazard assessments reviewed by the ESF staff April 2022.

Attachment E-2

Storage Documentation

The University of Vermont
Environmental Safety Facility
667 Spear Street
Burlington, VT 05405
802-656-0767

Storage Documentation

Drum #: XXXXX

Date when drum was first stored at ESF: xx/xx/xx

Contents of Drum: _____<No U.S. Disposal Option>_____

Comments:

There are no permitted disposal outlets in the United States that can manage this material in a cost effective and environmentally acceptable manner. When a cost-effective, legal and acceptable disposal outlet is identified, this drum will be closed out and transported on the next available shipment, which can handle this type of waste in accordance with all regulations and end disposal requirements, for proper recovery, treatment or disposal.

_____ _____
Environmental Compliance Manager Date

The University of Vermont
Environmental Safety Facility
667 Spear Street
Burlington, VT 05405
802/656-0767

Storage Documentation

Drum #: XXXXX

Date when drum was first stored at ESF: xx/xx/xx

Contents of Drum: _____<Drum Not full>_____

Comments:

This drum is not full, and due to the costs associated with proper handling of the hazardous waste, continued storage is necessary until the drum is full to facilitate proper recovery, treatment or disposal.

Once filled, the drum will be transported on the next available shipment, which can handle this type of waste in accordance with all regulations and end disposal requirements, for proper recovery, treatment or disposal.

_____ _____
Environmental Compliance Manager Date

The University of Vermont
Environmental Safety Facility
667 Spear Street
Burlington, VT 05405
802/656-0767

Storage Documentation

Drum #: XXXXX

Date when drum was first stored at ESF: xx/xx/xx

Contents of Drum: ____<Drum not filled within one year>_____

Comments:

This drum was not full within one year of its storage date, and due to the costs associated with proper handling of the hazardous waste, continued storage was necessary until the drum became full to facilitate proper recovery, treatment or disposal.

This drum became full on XX/XX/XX and will be transported on the next available shipment, which can handle this type of waste in accordance with all regulations and end disposal requirements, for proper recovery, treatment or disposal.

_____ _____
Environmental Compliance Manager Date

The University of Vermont
Environmental Safety Facility
667 Spear Street
Burlington, VT 05405
802/656-0767

Storage Documentation

Drum #: XXXXX

Date when drum was first stored at ESF: xx/xx/xx

Contents of Drum: _____<cylinders>_____

Comments:

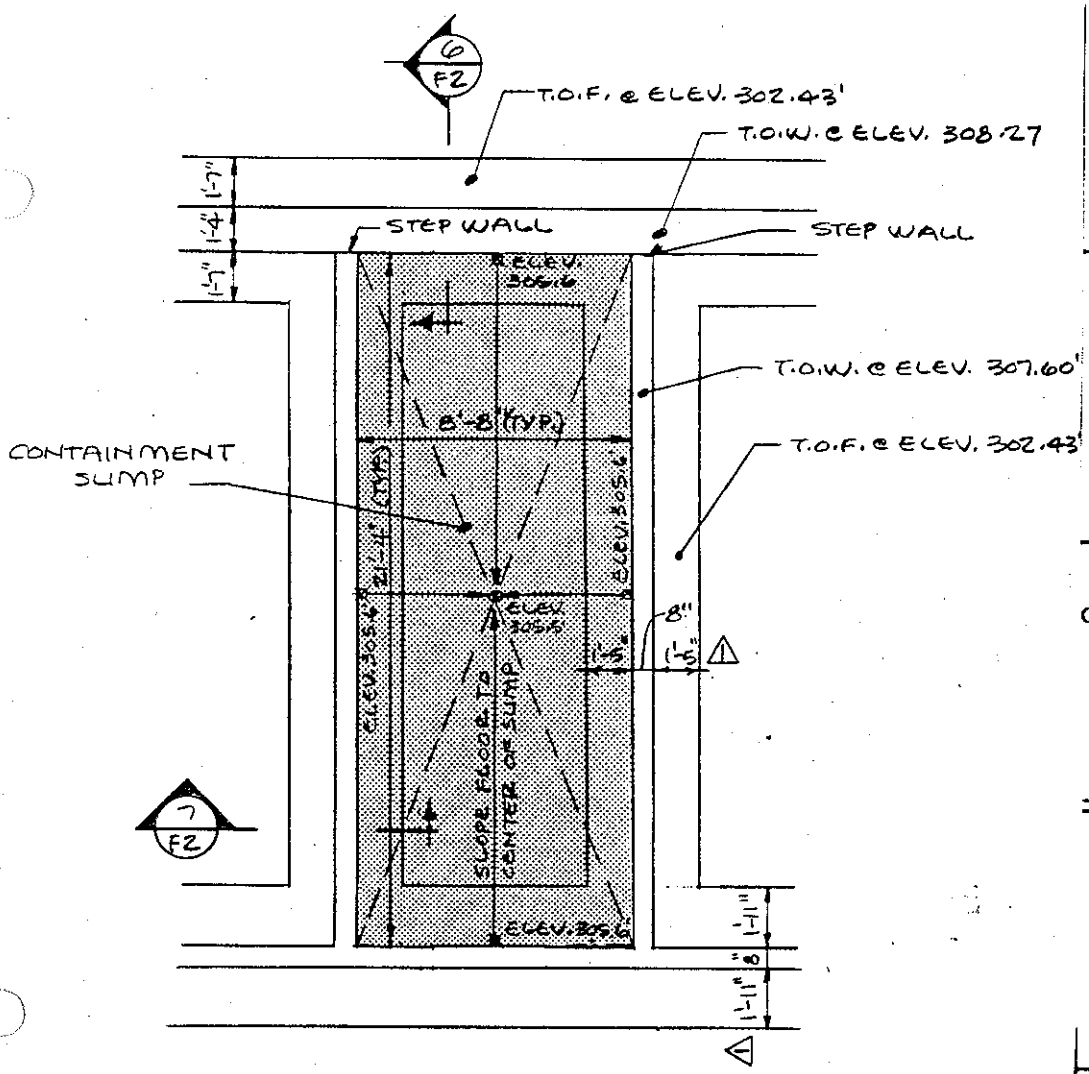
Due to the costs associated with proper handling of compressed gas cylinders containing hazardous materials, continued storage is necessary to accumulate quantities sufficient to facilitate proper recovery, treatment or disposal; specifically hiring a qualified contractor to download these cylinders into an appropriate solvent.

When sufficient amounts of this material have been accumulated, treatment and disposal will be scheduled at the next available opportunity to handle this type of waste in accordance with all regulations and end disposal requirements, for proper recovery, treatment or disposal.

_____ _____
Environmental Compliance Manager Date

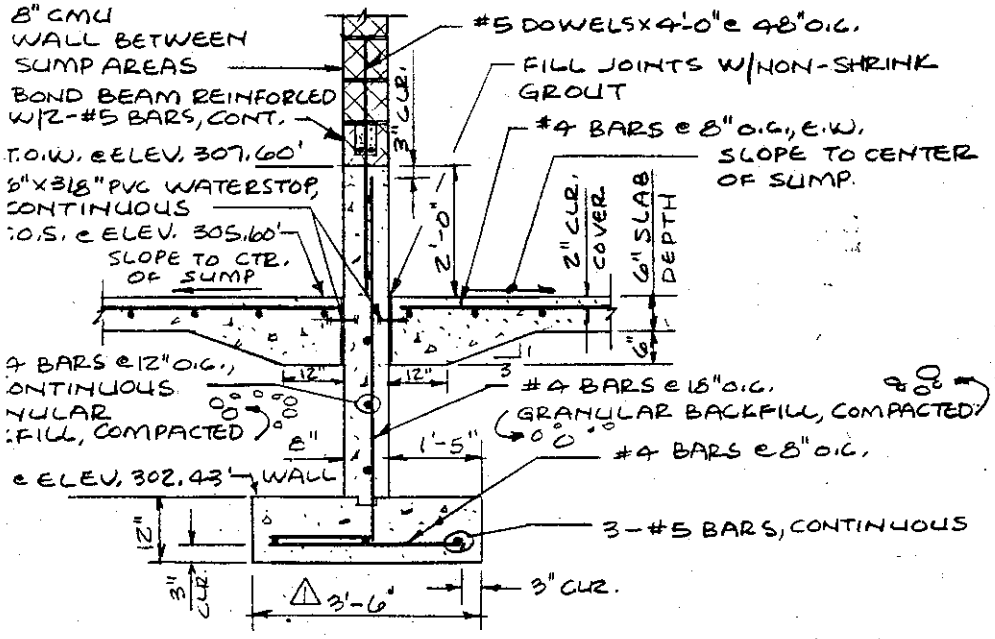
Attachment E-3

Sump Area Construction Plans



⚠1 (5) TYPICAL CONTAINMENT SUMP PLAN

1/4" = 1'-0"



⚠1 (7) CONTAINMENT SUMP WALL DETAIL

1/2" = 1'-0"

University of Verm

ARCHITECTURAL & ENGINEERING SER
109 SOUTH PROSPECT S1
BURLINGTON, VERMONT 05405
(802) 656

STATE OF VERMONT
GREGORY J. BOMBARDIER
NO. 4496
REGISTERED
PROFESSIONAL ENGINEER

Consultants

CHAMPLAIN CONSULTING ENGINEE
HARBORSIDE PROFESSIONAL BUILDI
SUITE 1D
128 PRIM ROAD
COLCHESTER, VERMONT 05446
(802) 863-8060

Project

UNIVERSITY OF VERMONT
ENVIRONMENTAL SAFETY FACILTY

ENSF 89020

Project No.	90138
Scale	NOTED
Drawn by	LRB
Checked by	4/1/93
Date	12/1/92

Revisions

No.	Date	
⚠	4/1/93	FINAL PLAN

Drawing Title

FOUNDATION DETAILS

Drawing No.

F-2

Attachment E-4

Waste Container Compatibility

Compatibility of Waste with Containers

Hazardous wastes stored at the Environmental Safety Facility (ESF) at the University of Vermont and State Agricultural College (UVM) will be stored in appropriate containers that have good structural integrity and are made of, or lined with, materials that will not react with, and are otherwise compatible with, the hazardous waste to be stored.

UVM's ESF uses DOT standards as set forth in 49 CFR §172 and §173 as a guideline for compatibility of hazardous waste with its container. All hazardous materials destined for off-site disposal, recycling or those managed as Universal Wastes, are shipped according to DOT requirements, and are stored with compatible materials.

Below are examples of commonly generated hazardous wastes and their corresponding compatible container.

WASTE TYPE	COMPATIBLE CONTAINER MATERIAL
Alkaline liquids	Poly/fiber/stainless steel
Acid liquids	Poly/fiber/stainless steel
Flammable liquids/solids	Steel, Poly/fiber
PCB liquids/solids	Steel
Poison liquids	Steel, Poly/fiber
Halogenated solvents	Steel, Poly/fiber
Flammable, corrosives	Poly/fiber
Other Haz waste (i.e., lead paint chips, oily debris)	Steel, Poly/fiber, cubic yard boxes
Reactive Wastes	Steel, Poly/fiber, combination

Waste containers, such as laboratory wastes awaiting lab packing, may be stored in their original or accumulation containers, while bulking and re-packing activities are in progress. While these containers are still chemically compatible, they are not DOT shipping containers. These containers are either bulked into or lab packed into the appropriate waste stream with the chemically compatible DOT-approved shipping container prior to shipment.

Appendix F

Security Plan

Security Plan

The University of Vermont and State Agricultural College's (UVM) Environmental Safety Facility (ESF)has the following security features to minimize the possibility of unauthorized entry of persons or livestock onto the facility's premises.

Access control
A 6-foot high fence surrounds the perimeter of the facility approximately 50 feet from the building meeting the requirements of 40 CFR§ 264.14(b)(2)(i). The access road to the facility has a gate to restrict entry onto the premises. The gate is secured after hours except to allow access to authorized persons only.

Both the main ESF building and the Reactives Storage building have locks that operate on the campus master key system. The Reactives Storage building remains locked at all times. Daily inspections are used to verify that all exterior doors in both buildings are locked.

The security fence and locked doors prevent the unknowing entry, and minimizes the possibility for the unauthorized entry, of persons or livestock onto the active portion of this facility. Physical contact with the waste containers, structures, or equipment within the active portion of the facility will not injure unknowing or unauthorized persons or livestock which may enter the active portion of the facility because the waste is containerized. There are no open piles, lagoons or other uncontainerized waste storage.

During routine ESF operations, only the front entrance to the main ESF building is unlocked. Any building entrants must pass through the occupied office space prior to accessing the active portion of the facility. ESF staff, within these offices, control entry of personnel into the active portion of the facility. The front entrance is locked when these offices are unoccupied. This meets the requirements of 40 CFR§ 264.14(b)(2)(ii).

24-hour surveillance system
The main ESF building is connected to a central intrusion alarm system tied to the University's Physical Plant and Police Services dispatchers. This system includes contacts on all doors, and motion detectors in the offices, conference room, and laboratory. Furthermore, the ESF grounds are within the area that is patrolled by UVM police, who are on duty 24 hours every day. This meets the requirements of 40 CFR§ 264.14(b)(1). While the Reactives Storage Building is not monitored remotely for intrusion, it is always locked and located within the security fence and within the area of UVM Police patrols.

Lighting
Light poles are located around the parking area, and flood lamps are mounted on the exterior of the building. Three of the building mounted lights are on the wall outside of the waste storage area. The area lights are photosensitive and come on when the sky gets dark. The light pole closest to the gate stays on all night; a timer shuts off the other lights automatically.

Signage

Signs with the legend, "Danger - Unauthorized Personnel Keep Out" as well as signs with the legend, "No Smoking" are posted at each entrance to the active portion of the facility. This includes each of the two gates, the door entering into the waste storage area from the office area, the loading dock door, each of the hazardous waste storage room emergency exit doors, the two side doors leading out from the waste storage area, and the door to the Reactives Storage Building. This meets the requirements of 40 CFR§ 264.14(c).

Appendix G

Contingency Plan

Contingency Plan Control Sheet
This is copy #

Numbered copies of this contingency plan for UVM's permitted hazardous waste treatment, storage, and disposal facility (TSDF) will be issued to the following organizations and companies to ensure they are familiar with operations and potential hazards associated with UVM's Environmental Safety Facility (ESF). The copies must be kept at the specified location. Only these copies will be updated, do not make unauthorized copies.

1	**UVM Environmental Safety Facility** 667 Spear Street Burlington, VT 05405 *(Contained in ESF permit)
2	**UVM Police Services** 284 East Avenue Burlington, VT 05405
3	**UVM Rescue** 284 East Avenue Burlington, VT 05405
4	**Burlington Fire Department** Deputy Chief of Operations 136 South Winooski Avenue Burlington, VT 05401
5	**South Burlington Fire Department** 575 Dorset Street South Burlington, VT 054035
6	**University of Vermont Medical Center, Risk Management** 111 Colchester Avenue Burlington, VT 05401
7	**Vermont Statewide LEPC** c/o Chief Patrick McLaughlin Division of Fire Safety, Tier II, HAZMAT 45 State Drive Waterbury, VT 05671
8	**NRC East Environmental Services, Inc.** 280 Commerce Street Williston, VT 05495
9	**Absolute Spill Response, LLC** PO Box 309, 21 Metro Way Suite #7 Barre, VT 05641

Contingency Plan

Introduction

This plan describes the actions to be taken by University of Vermont and State Agricultural College (UVM) personnel in the event of an incident involving hazardous waste materials at the Environmental Safety Facility (ESF). The plan will be implemented as soon as possible should any of the following conditions exist at the facility: fire; explosion; or release of hazardous waste or hazardous waste constituents that could threaten human health or the environment. The contingency plan will be reviewed and, if necessary, amended whenever the facility's permit is revised, the plan fails in an emergency, changes in the facility's operations alter the plan, or changes occur in the list of emergency coordinators or emergency equipment. A copy of the plan is maintained in room 100 of the ESF.

The Quick Reference Guide, per **VHWMR 7-308**(b)(14)(ii), is included as Attachment G-1 - *Quick Reference Guide*.

Coordination Agreements

A critical event at the ESF may require resources beyond the capacity of ESF staff. Therefore, emergency preparedness planning and awareness within local response agencies is necessary. This planning takes place at several levels: formal response plans and training, informal tours, routine interactions, and activities coordinated through the Vermont Statewide Local Emergency Planning Committee (LEPC). Each agency is provided a copy of UVM's contingency plan (see Contingency Plan Control Sheet); however, the potential response is continuously improved by regular interaction with the agencies involved.

<u>Vermont Statewide Local Emergency Planning Committee (LEPC)</u>
On July 1, 2021, Vermont consolidated 13 separate Local Emergency Planning Committees (LEPCs) to one statewide LEPC to carry out the requirements of the Emergency Planning and Community Right-To-Know Act (EPCRA). The statewide LEPC will focus on identification of hazardous materials that pose a risk and evaluating the available resources for preparing and responding to a potential natural or manmade disaster that could result in the release of hazardous chemicals.

UVM ESF staff have been active participants in the Chittenden County LEPC since its inception in 1988 and will continue to be involved with the statewide LEPC.

ESF staff submits the annual Tier II chemical inventory, as well as all updated hazardous waste contingency plans to the LEPC. UVM participates in LEPC exercises, regular meetings, and routine communications. The LEPC provides a forum to plan, become familiar with and to coordinate activities with Burlington Fire Department, South Burlington Fire Department, University of Vermont Medical Center, Vermont Emergency Management, Vermont State Hazardous Materials team, District 3 EMS, Vermont Health Department, Vermont's Homeland Security office, Vermont State Police and other emergency response and planning organizations in Chittenden County and the State.

UVM Police Services
UVM's police officers and dispatchers monitor fire and intrusion alarms at the ESF. UVM Police are likely to be the first response personnel on scene to an off-hour emergency at the ESF. Each police officer receives training to become familiar with the layout of the ESF and the locations where hazardous materials are stored.

UVM Police are expected to respond no further than the closest point where the emergency is recognized or the front door of the ESF whichever is farthest from the hazard.

UVM police roles at an ESF emergency may include law enforcement activities, notification of additional responders, evacuating area personnel, site security, mobile communications, and participation in unified command structure.

Burlington Fire Department - **primary emergency response**
Burlington Fire Department (BFD) has the primary responsibility for fire alarms at the ESF. ESF staff and firefighters from Station 3, located on Mansfield Avenue, prepare trainings for all shifts of BFD firefighters; these have included planned tours of the building as well as presentations with photographs of the ESF. Additionally, BFD crews make impromptu visits to the ESF for tours.

Burlington Fire Department has primary responsibility for uncontrolled releases of hazardous materials at the ESF. As the ESF building is designed to contain most releases, BFD would only need to assume this responsibility in the event of fire, explosion, injury, death, or excessive water release (such as fire suppression sprinklers) in the waste handling area of the building.

Burlington Fire Department also has the training, equipment, and capability to decontaminate patients that have been exposed to hazardous materials. Burlington Fire Department's Emergency Medical Responders are trained to respond to hazardous materials emergencies. UVM Rescue acts as the primary medical responders for the ESF.

South Burlington Fire Department - **secondary emergency response**
South Burlington Fire Department (SBFD) will back-up BFD, as necessary, in responding to fire alarms at the ESF. Training for SBFD has comprised of tours of the ESF and exercises and trainings coordinated through the LEPC.

Vermont Hazardous Materials Response Team – Hazmat support to fire departments is organized under the State Emergency Response Commission (SERC) and operated through Vermont Emergency Management, the State HAZMAT Team. This support is available to any fire department in Vermont responding to hazardous materials emergencies. The team is equipped for response into environments that require Level A, B, C or D personal protective equipment. The team is also equipped to identify and evaluate hazardous materials emergencies.

The State HAZMAT team will respond in an offensive mode to contain a spill and stop the source. They will function under the incident command of the local fire department to assure the safety of personnel and the environment. UVM, not the State HAZMAT team, is responsible for the cleanup of material spilled at the ESF.

The team is supported by any of several fire departments that are trained and equipped to provide decontamination services at hazardous materials scenes. These decontamination lines can be used to decontaminate emergency responders or victims. Rinse water from the decontamination line would be containerized and become the responsibility of UVM for hazardous waste determination and management.

Once the emergency is over (there is no threat of fire or to life) the scene will be handed back over to UVM for clean-up and remediation, as needed.

UVM Rescue – **primary medical response**
ESF personnel will provide potential exposure information by chemical or chemical type, based on current waste stored at the facility to the responding personnel. UVM Rescue HAZMAT medical response procedures are listed by general chemical categories.

UVM Rescue is dispatched through UVM Police Dispatch.

UVM Rescue, like most Vermont EMS units, has a policy of receiving HAZMAT contaminated patients only after they have been decontaminated on-scene. Burlington Fire Department's emergency medical response team is prepared to backup UVM Rescue, if necessary. Additional support can be provided by UVM Rescue, if needed, by paging additional providers.

University of Vermont Medical Center (UVMMC) – **emergency and long-term medical care**
UVMMC has a policy of receiving HAZMAT contaminated patients only after they have been decontaminated on-scene. However, the emergency department (ED) operates a decontamination room in the emergency room to allow UVMMC to better support a HAZMAT incident. ESF personnel will provide potential exposure information by chemical or chemical type, based on current waste stored at the facility to the responding personnel and to UVMMC. This information is either provided via the ambulance team's communications to the ED or, for direct transport, the emergency coordinator can relay information through UVMMC's Provider Access System (PAS) to the ED.

Emergency Response Contractors – **24-hour HAZMAT emergency response and remediation**
(NRC East Environmental Services, Inc., and Absolute Spill Response, LLC)
ESF routinely contracts 2 emergency response vendors for additional labor in handling waste, cleaning up spills, removing fuel tanks, and other projects. ESF staff maintains open budgets with each contractor for spill response. The contractors have 24-hour emergency response phone lines to request immediate response. Each contractor plans to be able to provide a two-hour response to ESF emergencies. The contractors are familiar with the layout and operations of the ESF.

UVM Physical Plant – **facilities and mechanical systems management**
UVM's Physical Plant Department (PPD) staff maintain and repair building electrical, plumbing, air handling and other systems at the ESF. ESF personnel escort PPD personnel if their work will bring them into the waste handling areas.

Hazardous Materials Emergency Coordinator

UVM hazardous materials emergency coordinators are available 24 hours a day to respond to and coordinate hazardous materials emergency response measures at the ESF. The emergency coordinators are familiar with the contingency plan, the facility layout and operations, locations and characteristics of the wastes handled, and the location of hazardous waste records within the facility. The emergency coordinator has the authority to commit the resources needed to carry out the contingency plan.

In case of a fire, explosion, or chemical release involving hazardous waste, UVM police dispatch or UVM Physical Plant SOS (dispatch) will notify the emergency coordinator. SOS can send out mass communication via email and text to all emergency coordinators.

If the dispatcher is unable to reach the primary emergency coordinator, the dispatcher will contact one of the alternate emergency coordinators. The emergency coordinator or alternate emergency coordinator will be accessible by phone. The primary emergency coordinator or one alternate emergency coordinator will always be available on-site, or on call. A UVM Police Services Shift Supervisor is always on-site at the UVM campus and available to respond to nearby noncontiguous sites, including the ESF.

The ranking, on-duty Police Services Shift Supervisor will secure the site in the event of a spill or release until chemical handling and emergency response staff arrive on the scene. The UVM Police Services Shift Supervisor is authorized to contact a hazardous material response contractor in the unlikely event that none of the emergency coordinators can be reached.

The Contingency Plan will be reviewed with UVM Police Services' Supervisors at least annually.

The emergency coordinator will be prepared to provide the following:

1. Emergency coordinator's name and telephone number
2. Facility name and address
3. Time and type of incident
4. Name and quantity of material(s) involved to the extent known
5. Extent of any injuries
6. Possible hazards to human health and the environment outside the facility

Emergency Coordinator List	**June 2023**
Primary Emergency Coordinator	
Dorian Evans, MS, REM, CHMM *Environmental Compliance Manager* Emergency Contact #: **214-563-4955** Work: 802-656-0767 Home: 214-563-4955 34 Overlook Lane Richmond, VT 05477	
Alternate Emergency Coordinators	
(1) **Brian Medor** *Environmental Safety Technician* Emergency Contact #: **802-228-6729** Work: 802-656-5408 Home: 802-868-3727 53 Pine Street Swanton, VT 05488	(2) **Brian Hodge** *Environmental Safety Technician* Emergency Contact #: **802-777-9183** Work: 802-656-5408 Home: 802-434-3171 8368 Main Road Huntington, VT 05462
(3) **Francis Churchill** *Director, Environmental Health & Safety* Emergency Contact #: **802-316-9566** Work: 802-656-5405 Home/Cell: 802-316-9566 20 Wheeler Lane Richmond, VT 05477	

Emergency Notification Procedures

The following procedures are integrated into the University of Vermont's Emergency Operations Plan and, if necessary, the Emergency Operations Group will assemble in accordance with that plan. Should any conditions exist at the facility that could threaten human health or the environment, the emergency coordinator will immediately implement the following emergency notification procedures:

1. Activate the internal alarm or communication system by pulling fire alarm pull boxes or using facility intercom or telephone if necessary.
2. The internal alarm system will notify a UVM Police Services dispatcher that an emergency exists at the facility; alternatively, Police Services can be called directly. Police Services will notify the Environmental, Health, and Safety department if an alarm occurs outside of normal operating hours.
3. The emergency coordinator will notify the Burlington Fire Department through the UVM Police Services' dispatcher or directly if via mobile phone, if the incident involves fire or explosion, or if there is a potential need to evacuate areas outside of the facility.
4. The emergency coordinator will notify a hazmat spill response contractor if facility personnel cannot contain the release of hazardous waste.
5. The emergency coordinator will notify the Vermont HAZMAT Hotline immediately (as the response allows) upon determining that a reportable release has occurred.
6. The emergency coordinator will notify the US Coast Guard if the incident threatens surface waters.
7. The emergency coordinator will notify the National Response Center if it is determined that the facility has had a fire, explosion, or release that could threaten human health or the environment outside of the facility.
8. The emergency coordinator will notify the University of Vermont Office of Emergency Management. This activates, if necessary, UVM's Emergency Operations Center and Emergency Operations Group, including financial, public relations, police, and physical plant services.

Emergency Telephone Numbers

UVM Police / Rescue - Emergency (on campus)	911
UVM Police - Non-emergency	802-656-3473
UVM Rescue - Non-emergency	802-656-4287
Burlington Fire Department	911
UVMMC Provider Access System (PAS)	802-847-2700
HAZMAT Contractor: NRC East Environmental Services, Inc	800-899-4672
HAZMAT Contractor: Absolute Spill Response, LLC.	877-947-7455
Vermont HAZMAT Hotline	1-800-641-5005
Vermont DEC (business hours)	802-828-1138
National Response Center	1-800-424-8802
US Coast Guard	802-951-6792
UVM Physical Plant (Facilities)	802-656-2560

Evacuation Plan

The fire alarm is the signal to initiate an evacuation of the facility. Upon hearing the fire alarm, facility personnel will proceed to the nearest emergency exit. All emergency exits have an illuminated EXIT light.

- Facility personnel's normal work activities occur mostly in the offices and laboratory portion of the building. Personnel would exit from these areas through the main ESF entrance (East side) or through the laboratory in room 108 (West side).
- Routine waste activities occur in the workroom (109). There are two exits from this room that allow access to the exits at the West stair, East stair, or laboratory. Personnel would doff PPE, as necessary once they achieve a safe distance from the emergency.
- Emergency exiting from the waste storage rooms (110 – 120) will primarily happen through any of the 11 doors that exit directly to the outside (North side). If the situation requires alternative exits, personnel will exit the rooms into the main facility hallway and then proceed to the nearest, accessible stairwell exit.

All facility personnel will meet outside of the upwind (Northeast or Southeast) gate of the facility, at a safe distance, and will report to the emergency coordinator. The emergency coordinator will meet emergency responders at the gate. If there is a fire or excess release/fumes, the emergency coordinator will meet emergency responders at the entrance to the BioResearch Center at Spear Street.

The evacuation plan will be reviewed with all facility personnel on an annual basis. A copy of the building plan with emergency exits marked can be found in Attachment G-2 – *Site Plan and Floor Plan*.

Identification of Hazardous Waste Materials

Should a fire, explosion, or release occur at the facility, the emergency coordinator must immediately identify the character, source, amount, and extent of any released materials by observation, record review, or if necessary, chemical analysis.

The facility maintains a drum report identifying the DOT shipping name, quantity and locations of all bulk and lab-packed wastes stored at the facility. The inventory is updated whenever there is a change and posted in the front foyer of the ESF. This information can also be viewed remotely online. See Attachment G-3 – *Properties of Hazardous Waste* for a listing of hazardous properties associated with common wastes stored at the ESF.

Assessment of Risk to Community, Health & Environment

Whenever there is a release to the environment, fire, or explosion at the ESF, the emergency coordinator will assess the known hazards to human health and the environment, considering all direct and indirect effects. The assessment will include source, identity, amount, and extent of a release; the effects of any hazardous surface water run-off from water or chemical agents used to control fire and heat-induced explosions, wind direction, and containment.

If the assessment indicates that evacuation of a surrounding area may be advisable, the emergency coordinator will advise the ranking on-scene Fire Department officer of the situation and provide University assistance as requested. The emergency coordinator will also notify the National Response Center if it is determined that the facility has had a fire, explosion, or release that could threaten human health or the environment outside of the facility.

Control and Containment Procedures for Hazardous Waste Releases

The following actions must be taken in the event of a release of hazardous waste to the environment:

1. If a danger of fire exists, contact the Burlington Fire Department through the UVM Police dispatcher. See the notification section for the information that must be provided.
2. If facility personnel cannot contain the release, contact a hazardous material response contractor.
3. Identify the source of the leak. The emergency coordinator will determine the appropriate level of personal protective equipment.
4. Stop the source of the leak if possible.
5. Contain any leaked fluid by diking, if necessary, with absorbent materials or by trenching.
6. If necessary, the emergency coordinator or designee will close the control structure at the end of the stormwater retention pond.

Emergency Procedures for Fire and/or Explosion

The following actions must be taken in the event of a fire or explosion at the facility:

1. Activate the fire alarm system.
2. Initiate evacuation procedures. Evacuation routes are posted throughout the facility. In addition, all facility personnel will be trained in the proper evacuation procedures.
3. Meet the first arriving fire company and inform the officer of the following:
    a. Unaccounted facility personnel
    b. Amount and types of hazardous wastes involved
    c. Area of the facility involved
    d. Any additional information, as needed.
4. If a release of hazardous waste has occurred, implement the emergency procedures for hazardous waste releases, as outlined above.
5. During the emergency, the emergency coordinator will act as liaison between the Fire Department, the emergency contractor, and University personnel.
6. Once the fire department has given the "all clear" signal, the emergency coordinator or the designated emergency contractor will inspect the facility to determine if it is safe for others to enter the facility.

Prevention of Recurrence or Spread of Fires, Explosions, or Releases

1. Take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other areas at the facility. These measures will include, as applicable:
    a. Stopping processes and operations
    b. Collecting and containing released waste
    c. Removing or isolating containers
2. If the facility stops operations in response to a fire, explosion, or chemical release, the emergency coordinator or the designated emergency contractor will monitor for leaks, pressure buildup, gas generation or ruptures in valves, pipes, or other equipment, wherever this is appropriate.

Cleanup Procedures

Clean up and repair activities shall be initiated within 24 hours of discovering a spill or leak, once the scene has been handed back over to ESF personnel.

1. Personnel involved in cleanup activities will wear appropriate personal protective equipment. The emergency coordinator or the designated emergency contractor will evaluate the hazards present and recommend the appropriate level of protection.
2. All contaminated soil, vegetation, and absorbent material will be collected and placed in suitable DOT approved containers, which will be properly labeled for future disposal. decon materials will continue to be stored separately.
3. Any runoff water held within the storm water retention pond will be analyzed in accordance with appropriate test methods to determine if it meets the definition of hazardous waste. If it is determined to be hazardous, the run-off will be pumped out and transported to a permitted TSDF and remediation efforts will be implemented for contaminated soil. If the run-off is determined to be free of contamination, the control structure will be opened, and the pond will be drained in accordance with the laws and regulations enforced by the DEC Watershed Management Division.
4. Any freestanding liquid hazardous waste will be pumped into compatible, properly labeled, DOT approved containers. The drums will then be stored in the appropriate storage area until transported for final disposal.
5. The contents of any leaking drum will be transferred into a compatible structurally sound drum, or the leaking drum will be overpacked into a DOT approved drum.
6. All emergency equipment utilized during the emergency will be cleaned and returned to duty after the emergency. Any equipment determined to be unfit will be replaced.
7. The facility will not accept any waste for storage until the released material has been cleaned up.

Post-emergency Procedures

After the Emergency Coordinator has evaluated the situation and determined that the emergency is over and an adequate cleanup of the affected areas is complete, they must:

1. Notify the Secretary of Natural Resources that the facility is in compliance with Section 7-308(b)(14)(E)(ix) of the Vermont Hazardous Waste Regulations before operations are resumed in the affected areas of the facility.
2. Maintain on file with the contingency plan; the time, date, and details of any incident that requires implementing the contingency plan; and
3. Within 10 days after the incident, submit a written report on the incident to the Secretary of Natural Resources. Attachment G-4 – *Spill Report Form*, from the Vermont Agency of Natural Resources, is an example form that would be used for reporting. The report must include:
    - Name, address, and telephone number of the owner or operator of the facility
    - Name, address, and telephone number of the facility
    - Date, time, and type of incident
    - Name and quantity of material(s) involved
    - Extent of any injuries
    - Assessment of actual or potential hazards to human health or the environment, where this is applicable
    - Estimated quantity and disposition of the recovered material that resulted from the incident

Emergency Equipment

Fire Protection Equipment

The facility is equipped with a temperature-activated fire suppression system. All water-reactive waste is stored in a separate outdoor storage building that is equipped with fire-resistant wallboard and a dry chemical extinguishing system.

Hand-held ABC rated fire extinguishers are located within the chemical storage and work areas of the facility. In addition, a Class D extinguisher is mounted in the general work area for use on flammable metal fires. Fire extinguishers are visually inspected monthly.

Communications Equipment

- Internal and external phone lines allow communication among personnel throughout the building; phone locations are shown on maps on pages 1 and 2 of Attachment G1.
- A fire alarm system capable of summoning emergency assistance, including detection and pull stations, has been installed throughout the facility in accordance with local fire codes. Fire alarm pull box locations are shown on maps on pages G1-1 and G1-2.
- All ESF staff members carry cell phones.

First Aid

First Aid and emergency medical treatment is available through UVM rescue. The waste storage area is equipped with three safety shower and eyewash stations, and the work area is equipped with one safety shower eyewash station.

Respiratory Protective Equipment

All responding facility personnel will be provided with respiratory protection, respirator training, and annual quantitative fit testing. Responding personnel will complete an occupational physical including a pulmonary function test (PFT) according to UVM's respiratory protection program.

Spill Response Equipment
Spill response equipment, sufficient for any spill which would be contained by facility personnel without the aid of an outside emergency contractor, is maintained and kept accessible to the general work area. In the event of an emergency involving more than minimal spill equipment, the 24-hour emergency response contractor will be called to respond.

The following equipment is reserved at the ESF for emergency spills and maintained at positions indicated on the facility site plan:

2	Chemical splash goggles	2	Rubber gloves (pairs)
2	Rubber aprons	2	Pails
10	Sponges	1	Container of pH paper
10	Sample vials	10	Tychem suits
2	Level "B" suits	2	Dust pans
2	Brooms	20	Poly bags
2	Squeegees	1	Sodium bicarbonate
10	Bags Speedi-Dry	1	85-gallon overpack drum
2	Hand pumps	2	55-gallon steel closed head drums
2	55-gallon open head steel drum	2	30-gallon poly closed head drums
2	55-gallon poly closed head drums	2	15-gallon poly closed head drums
2	16-gallon poly open head drums		

Any spill containment equipment utilized during a spill will be decontaminated or properly disposed of and replaced. The decontamination process will be relative to the materials contaminated and may produce additional waste, which will be collected and managed accordingly.

Locations of emergency equipment and personal protective equipment are indicated on the floor plan included in this contingency plan (Attachment G-2, page 1).

Procedures and equipment used to mitigate the effects of equipment failure or power outage

The ESF has an emergency generator located outside the building capable of powering phones, ventilation, exhaust fans, heat, fire alarms, security alarms, interior emergency lighting, and exterior site lighting. In the case of a power outage, the emergency generator powers critical ESF equipment. The physical plant department is responsible for maintaining the onsite generator. Routine testing by physical plant occurs monthly, and planned maintenance by on outside contractor occurs every 6 months. The location of the emergency generator is shown on page 3 of Attachment G1.

Critical ESF systems are monitored 24 hours a day by UVM's Physical Plant Department. Should a critical piece of equipment fail during off-hours, both ESF staff and physical plant personnel are on-call to address the situation.

Contingency Plan for the Reactives
Storage Building at the Environmental Safety Facility

Prevention
In order to minimize the chance of a reaction, all reactive chemicals will be stored in the laboratory bottles in which they were shipped. To protect against a release, all bottles will be placed in secondary containers. Containers of reactive waste will be stored in the Reactives Storage Building. During periods of extreme hot or cold weather, some materials may be stored in the main ESF building when the temperature poses a safety concern. Packaging or repacking of containers of reactive chemicals is done in room 109 of the main ESF building.

Building Specifications
The Reactives Storage Building is used to store water reactive, air reactive, spontaneously combustible, poly-nitrated compounds, and other reactive material. This building is a commercially manufactured product with the following safety features:

- Fire resistant wallboard and steel construction
- Corrosion protected steel
- Pressure release panel on rear wall, safety chained to wall
- 6" deep secondary containment sump lined with 20 mils HDPE
- Dry chemical fire suppression system, with fusible-link, automatic activation, and manual pull station activation
- Exterior audible fire alarm
- Class 1, Groups C & D, Division 1 lighting, fan & electrical outlet
- Static grounding system

Response to a release of hazardous materials
In case of a release that does not result in an energetic reaction, the material will be stabilized only if the exact contents are known. For instance, sodium metal would be covered in mineral oil. The material would then be cleaned up using the emergency spill equipment located within the East Stairwell of the main ESF building which includes static-proof brooms, shovels, and water absorbing towels.

Small reactions or fires can be controlled with the Class D fire extinguisher, located outside of room 109 in the loading area of the ESF (see map on page G1-1). This extinguisher is approximately 120 feet from the reactive storage building and 30 feet from room 109.

Response to explosion, fire, or other energetic release
ESF personnel WILL NOT attempt to control a large, energetic reaction, explosion, or fire. ESF personnel will attempt to control the resulting release using absorbents, diking, and trenching methods; and the pond valve will be closed. Emergency response personnel will be called as specified in the notification portion of the contingency plan.

In all instances

- The emergency coordinator will choose the proper PPE.
- Clean-up personnel will follow decontamination procedures.
- Emergency coordinator will follow Emergency Notification Procedures.

Contingency Plan for Transporting Hazardous Wastes
For operators of UVM vehicles that transport hazardous materials

Prevention
Wastes are packaged in sealed DOT-approved containers and transported to the ESF only in properly permitted, vehicles that are placarded in accordance with DOT regulations. The waste containers are unloaded at the loading dock inside the truck bay. DOT-required shipping documents are within arm's reach of the driver or on the driver's seat if the driver is not on the truck at all times.

Response to accident or release

1. Protect Yourself
Stay upwind and uphill of any accident involving suspected hazardous materials. Do not touch any spilled material; breathe any smoke, fumes, or vapors. Do not eat, drink, or smoke.
Use Personal Protective Equipment! All vehicles carrying hazardous materials are equipped with the PPE necessary for dealing with discharges of those materials.

2. Call for Help
All ESF vehicles are equipped with a cellular telephone while transporting hazardous waste. UVM Police will notify appropriate fire department and / or EMS.

UVM Police Services / Rescue	911
Burlington Fire Department	911
South Burlington Fire Department	911

Relay all pertinent information including:
- Location of accident
- Injuries
- Chemical involved
- Size of spill
- Danger to public and environment
- Potential impacts to waterways
- Assistance needed

ESF will notify spill contractors.

NRC East Environmental Services, Inc.	800-899-4672
Absolute Spill Response, LLC.	877-947-7455

3. Rescue the Injured
While considering all hazards, using appropriate safety equipment, recognizing your training limitations, and assessing the immediate danger to the victim and yourself, administer first aid and emergency response.

- For contamination, flush area with water for 15 minutes, remove contaminated clothing. Protect yourself.
- Do not move victim unless there is an immediate danger in that area.

- Administer First Aid, being aware that the victim may be contaminated with a hazardous material.
- Inform EMS, hospital, and any other responder of the nature of the hazardous exposure.
- Blankets can be used to prevent contamination of the ambulance interior.

4. Contain the Spill

Using proper PPE determined by the emergency coordinator, attempt to stop, slow, or contain the leak. Plugging holes, constructing dikes, or simply changing the position of the drum can accomplish this. All hazardous materials hauling vehicles should carry proper PPE.

If the discharge has reached the ground, use absorbent materials or trenching techniques to control the spread of the material. Prevent spilled material or firefighting runoff from entering sewers, drains, buildings, and water sources, by using absorbents, trenching, diking, or diverting the material. All hazardous materials hauling vehicles should also have proper spill containment equipment, such as absorbent materials, broom, shovel, and a salvage type drum.

Prevent the public from entering the area. Evacuate all unnecessary persons. Direct and reroute traffic. Consult North American Emergency Response Guidebook, table of Isolation & Evacuation Distances to determine if downwind evacuation or contamination zones need to be implemented.

5. Allow Trained Personnel to Perform Their Tasks

When the fire department arrives, inform them of the nature of the chemical, and allow them to work. Assist spill response personnel with information but allow them to lead the cleanup efforts.

Attachment G-1
Quick Reference Guide

Emergency Coordinator List

<table>
<tr><th colspan="2">Primary Emergency Coordinator</th></tr>
<tr><td colspan="2">Dorian Evans, MS, REM, CHMM
Environmental Compliance Manager
Emergency Contact #: 214-563-4955

Work: 802-656-0767
Home: 214-563-4955
34 Overlook Lane
Richmond, VT 05477</td></tr>
<tr><th colspan="2">Alternate Emergency Coordinators</th></tr>
<tr><td>(1) Brian Medor
Environmental Safety Technician
Emergency Contact #: 802-228-6729

Work: 802-656-5408
Home: 802-868-3727
53 Pine Street
Swanton, VT 05488</td><td>(2) Brian Hodge
Environmental Safety Technician
Emergency Contact #: 802-777-9183

Work: 802-656-5408
Home: 802-434-3171
8368 Main Road
Huntington, VT 05462</td></tr>
<tr><td>(3) Francis Churchill
Interim Director of Risk Management
Emergency Contact #: 802-316-9566

Work: 802-656-5405
Home/Cell: 802-316-9566
20 Wheeler Lane
Richmond, VT 05477</td><td></td></tr>
</table>

Waste Storage Information

ROOM	Hazardous Waste Types	Hazards	Max. Volume (gallons)
109	Temporary storage, all types	Varies	Varies
110	Flammables, Poisons	Ignitable, Toxic[2], Reactive with Acids[3]	1,100
111	Flammables, Poisons	Ignitable, Toxic[2], Reactive with Acids[3]	1,100
112	Flammables, Poisons, Corrosives	Ignitable, Toxic[2], Corrosive[4]	1,100
113	Flammables, Poisons	Ignitable, Toxic[2]	1,100
116	Flammables, Poisons, Organic acids, Organic peroxides, Other regulated material	Ignitable, Corrosive, Toxic, Reactive/Intensify Fire	1,100
118	Inorganic acids, Oxidizers	Corrosive[4], Toxic[2], Reactive/Intensify Fire	1,100
119	Alkaline/Bases, Mercury, PCBs	Corrosive, Toxic[5]	1,100
120	Ballasts, Fluorescent lamps, Mercury, PCBs	Toxic[5]	1,100
RSB[1]	Reactive wastes	Pyrophoric, water-reactive, self-reactive	440

1. Reactives Storage Building
2. Exposure to cyanide containing materials and vapors will require specialized medical treatment.
3. Cyanide bearing waste may form potential inhalation hazards on contact with acids.
4. Exposure to acids, including hydrofluoric acid solution and vapors, could require specialized medical treatment.
5. Exposure to heavy metal bearing wastes may require specialized medical treatment.

Properties of Hazardous Waste Stored at the ESF

Type of Waste
Hazardous properties, injury or illness that could result from exposure to chemicals involved in fires, explosions, or releases at ESF
Flammable Liquids and Gases
Flammable liquids and gases readily catch fire and burn in air. Containerized flammable liquids may boil or become pressurized in a fire and vent explosively with either a spout of flame or shrapnel from the container. These can cause serious tissue burns. Superheated vapors can be inhaled causing excessive burns to the respiratory system.
Flammable Solids
Flammable solids readily catch fire and burn in air, often with intense heat. These are often difficult to extinguish and can cause deep tissue burns.
Pyrophoric or Spontaneously Combustible Materials
Pyrophoric chemicals react with the air to catch fire, or release a toxic, flammable, or corrosive gas. These can cause temperature burns, corrosive burns, asphyxiation, or other toxic effects.
Water Reactive
Water reactive chemicals react with water (including excessive humidity in the air) to catch fire, or release a toxic, flammable or corrosive gas.
Oxidizing Agents
Oxidizing agents may react violently when they come into contact with reducing agents and sometimes with ordinary combustibles. The resulting fire or explosion can cause serious burns.
Corrosive Materials
Corrosive materials are acids (pH less than 2.0) and bases (pH>12.5). These can cause destruction of living tissue by chemical action at the site of contact and can be solids, liquids or gases. Corrosive effects can occur on the skin and in eyes, as well as in the respiratory or gastrointestinal tract. Corrosive effects can happen rapidly. Some materials, such as hydrofluoric acid, are specific to the materials they target, making emergency decontamination difficult. Many oxidizing agents also have corrosive effects.
Toxic – Irritants
Irritants are non-corrosive chemicals that cause reversible inflammatory effects.
Toxic – Allergen
Chemical allergies can result from low-level exposures to chemicals, following previous sensitization. Allergy-related symptoms can range from mild skin irritation to chemical pneumonitis and anaphylactic shock. Allergy symptoms can present soon after exposure or can be delayed.
Toxic – Asphyxiant
Asphyxiants prevent oxygen from getting into the body (simple asphyxiants) or prevent oxygen from getting to organs and tissue once inside the body (chemical asphyxiants).
Toxic – Carcinogens, Reproductive & Developmental toxins
Carcinogenic materials cause, or are suspected to cause, cancer or uncontrolled cell growth. Mutagens cause mutations in cell growth. Teratogens cause birth defects in the offspring of the exposed individual. Reproductive toxins may target the male or female reproductive systems resulting in adverse effects on fertility, gestation, lactation, or reproductive performance. Developmental toxins produce adverse effects on the development of an embryo or fetus.
Toxic – Neurotoxin
Neurotoxins target the central nervous system (brain, spinal cord, neurotransmission, cerebrospinal fluid) or the peripheral nervous system (nerves and neurons). Neurotoxic effects range from slurred speech and headaches to neuropathy, paralysis, and death.
Toxic – Toxins affecting specific organs or systems
Specific chemicals can target and disrupt the function of the kidneys, liver, blood formation system and other body systems and organs.

The general hazards described in the above table do not account for routes of exposure, duration or frequency of exposure, concentration of chemical, or the hazards of mixed chemicals. A chemical may be expected to have more than one hazard (i.e., flammable and toxic). Those factors, along with the acute and chronic effects of exposure, need to be considered in any hazard analysis.

Evacuation Procedure and Routes

The fire alarm is the signal to initiate an evacuation of the facility. Upon hearing the fire alarm, facility personnel will proceed to the nearest emergency exit. All emergency exits have an illuminated EXIT light.

- Facility personnel's normal work activities occur mostly in the offices and laboratory portion of the building. Personnel would exit from these areas through the main ESF entrance (East side) or through the laboratory in room 108 (West side).
- Routine waste activities occur in the workroom (109). There are two exits from this room that allow access to the exits at the West stair, East stair, or laboratory. Personnel would doff PPE, as necessary once they achieve a safe distance from the emergency.
- Emergency exiting from the waste storage rooms (110 – 120) will primarily happen through any of the 11 doors that exit directly to the outside (North side). If the situation requires alternative exits, personnel will exit the rooms into the main facility hallway and then proceed to the nearest, accessible stairwell exit.

All facility personnel will meet outside of the upwind (Northeast or Southeast) gate of the facility, at a safe distance, and will report to the emergency coordinator. The emergency coordinator will meet emergency responders at the gate. If there is a fire or excess release/fumes, the emergency coordinator will meet emergency responders at the entrance to the BioResearch Center at Spear Street.

The evacuation plan will be reviewed with all facility personnel on an annual basis. A copy of the building plan with emergency exits marked is attached and can also be found in Attachment G-2 – *Site Plan and Floor Plan*.

Maps and Diagrams

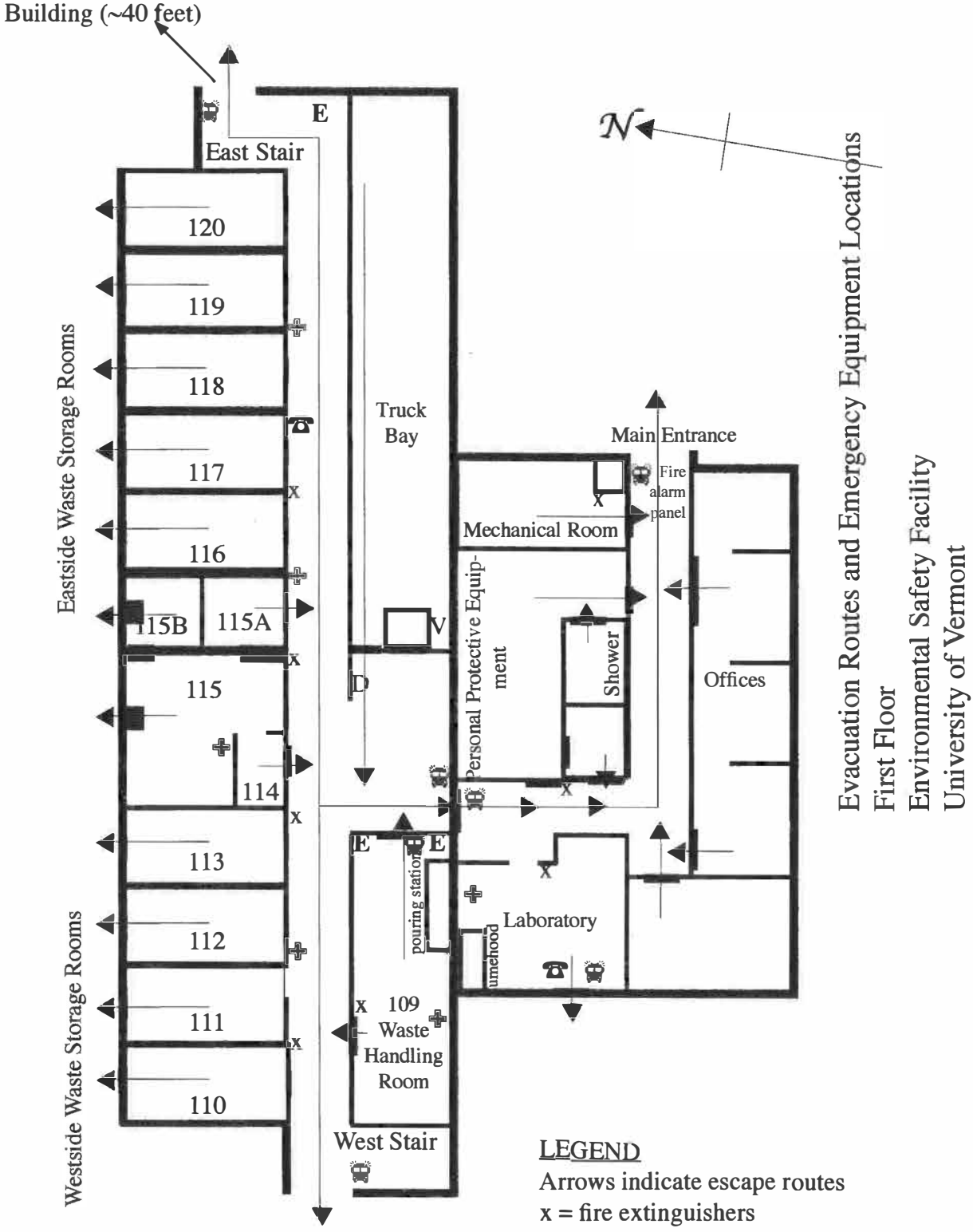
Site Plan – Attachment G-2

Page 1 includes where hazardous wastes are generated, accumulated, and treated. It also includes routes for accessing these wastes and the evacuation routes. Page 1 also shows the location on the fire alarm panel, located near the main entrance.

Page 3 shows the Reactives Storage Building, where additional hazardous wastes are stored. Also shown on Page 3 is the fire hydrant, fencing around the property, and containment moat. The fire hydrant available to service the ESF has a flow rate of 711.89 gallons per minute.

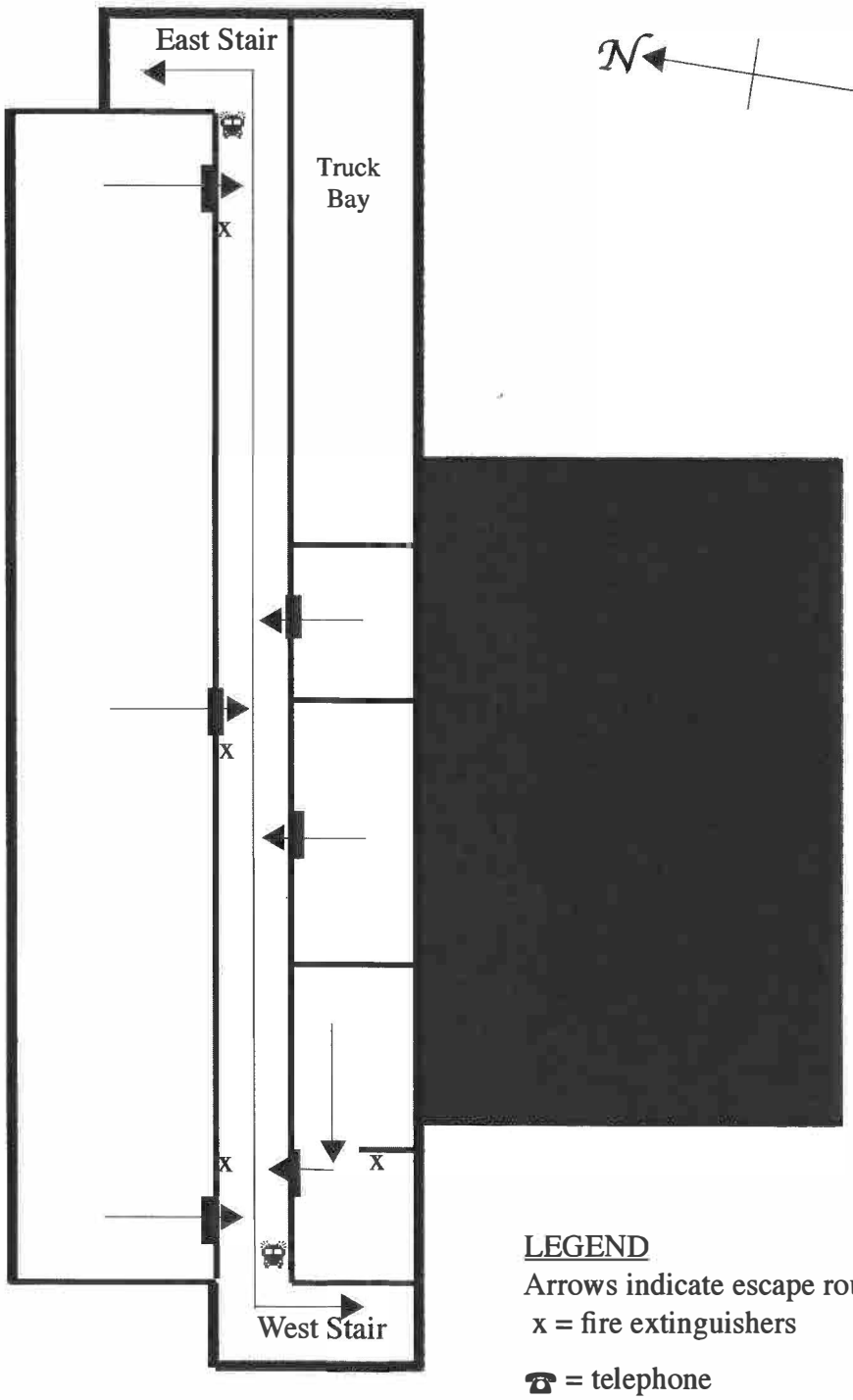
Surrounding Properties

The ESF is located approximately one mile South of UVM's athletic facilities within the UVM BioResearch Complex (BRC) on the West side of Spear Street. The Burlington Country Club golf course forms the North and West boundaries of the site, approximately 300 feet from the ESF. The Meadowbrook Condominium Association's multi-family housing, and the Roman Catholic Diocese's Rice High School, are located approximately 1000 feet to the South, and southwest respectively. of the ESF on the other side of a field cultivated by the UVM's Miller Research Farm. The following Ortho map provides an aerial view of the ESF and surrounding properties.



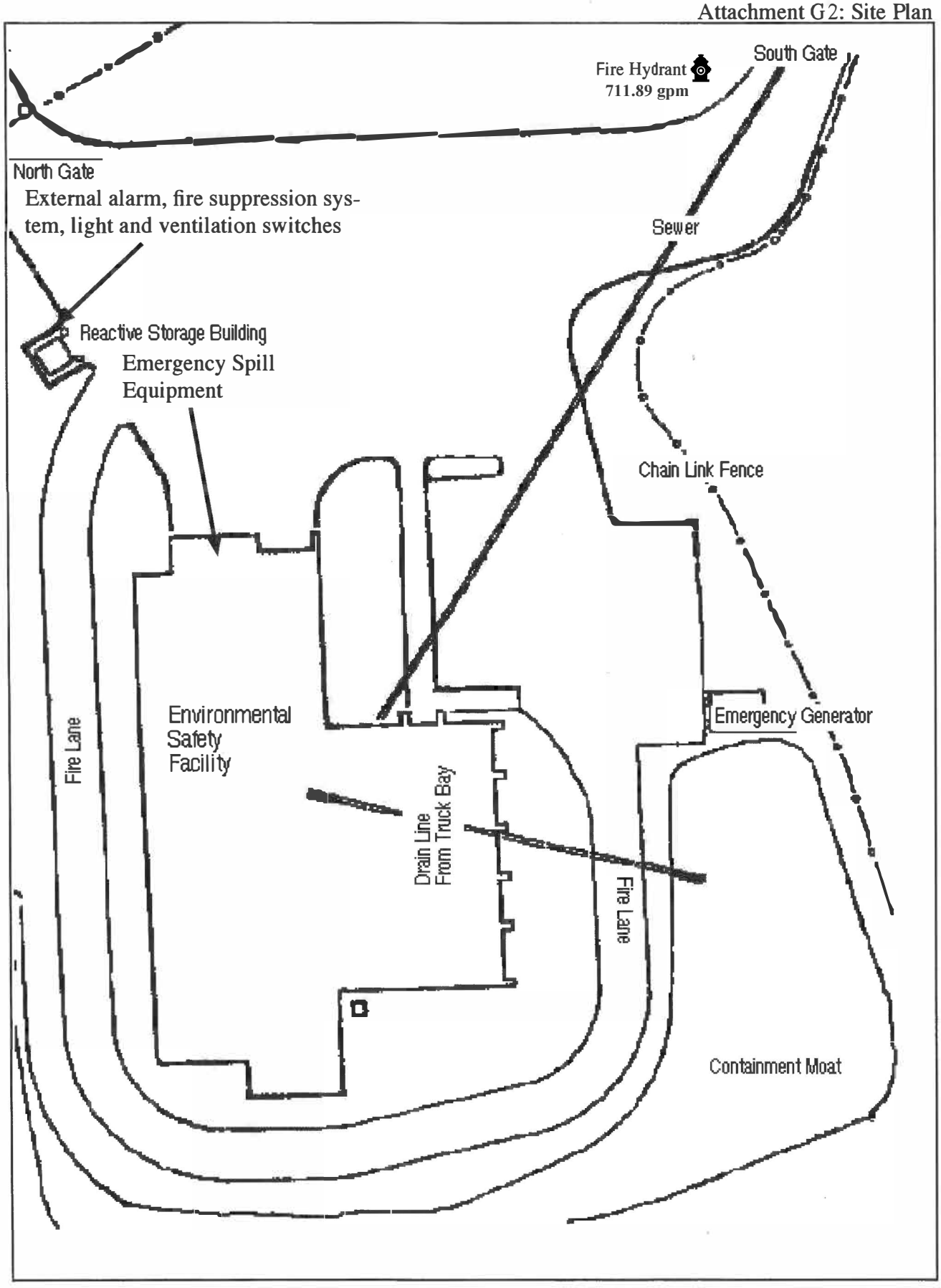
LEGEND

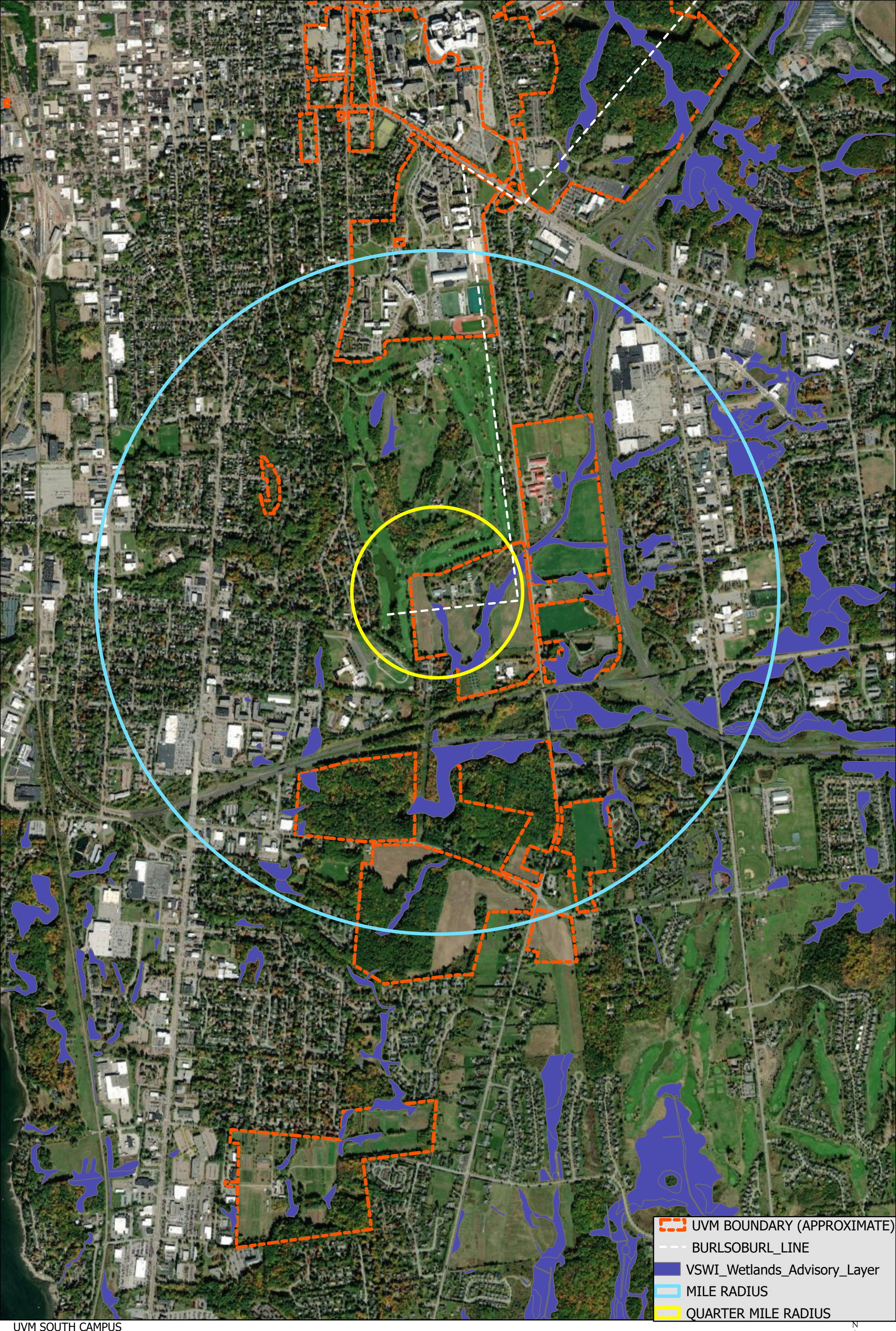
Arrows indicate escape routes
x = fire extinguishers
D = Class D fire extinguisher
= fire alarm pull station
☎ = telephone
✙ = eyewash / safety shower
E = Emergency Spill Equipment
V = Shut-off valve for trench drain in truck bay



Evacuation Routes and Emergency Equipment Locations
Second Floor
Environmental Safety Facility
University of Vermont

LEGEND
Arrows indicate escape routes
x = fire extinguishers
☎ = telephone
= fire alarm pull station

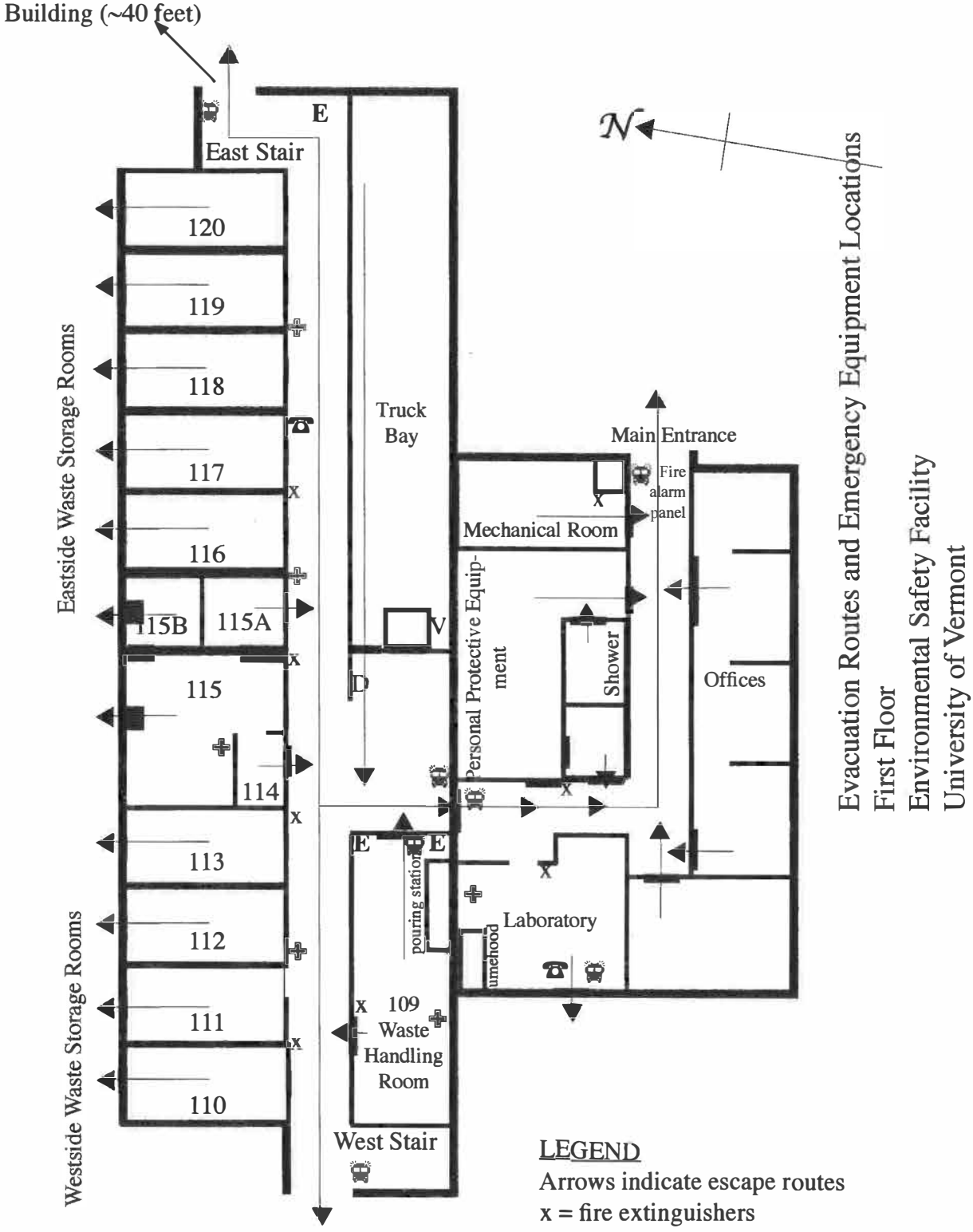

South Gate
Fire Hydrant
711.89 gpm
North Gate
External alarm, fire suppression system, light and ventilation switches
Sewer
Reactive Storage Building
Emergency Spill Equipment
Chain Link Fence
Environmental Safety Facility
Emergency Generator
Fire Lane
Drain Line From Truck Bay
Fire Lane
Containment Moat



UVM SOUTH CAMPUS
2018 ESRI IMAGERY
Map Produced by UVM Planning, Design, & Construction

Attachment G-2

Site Plan &
Floor Plans



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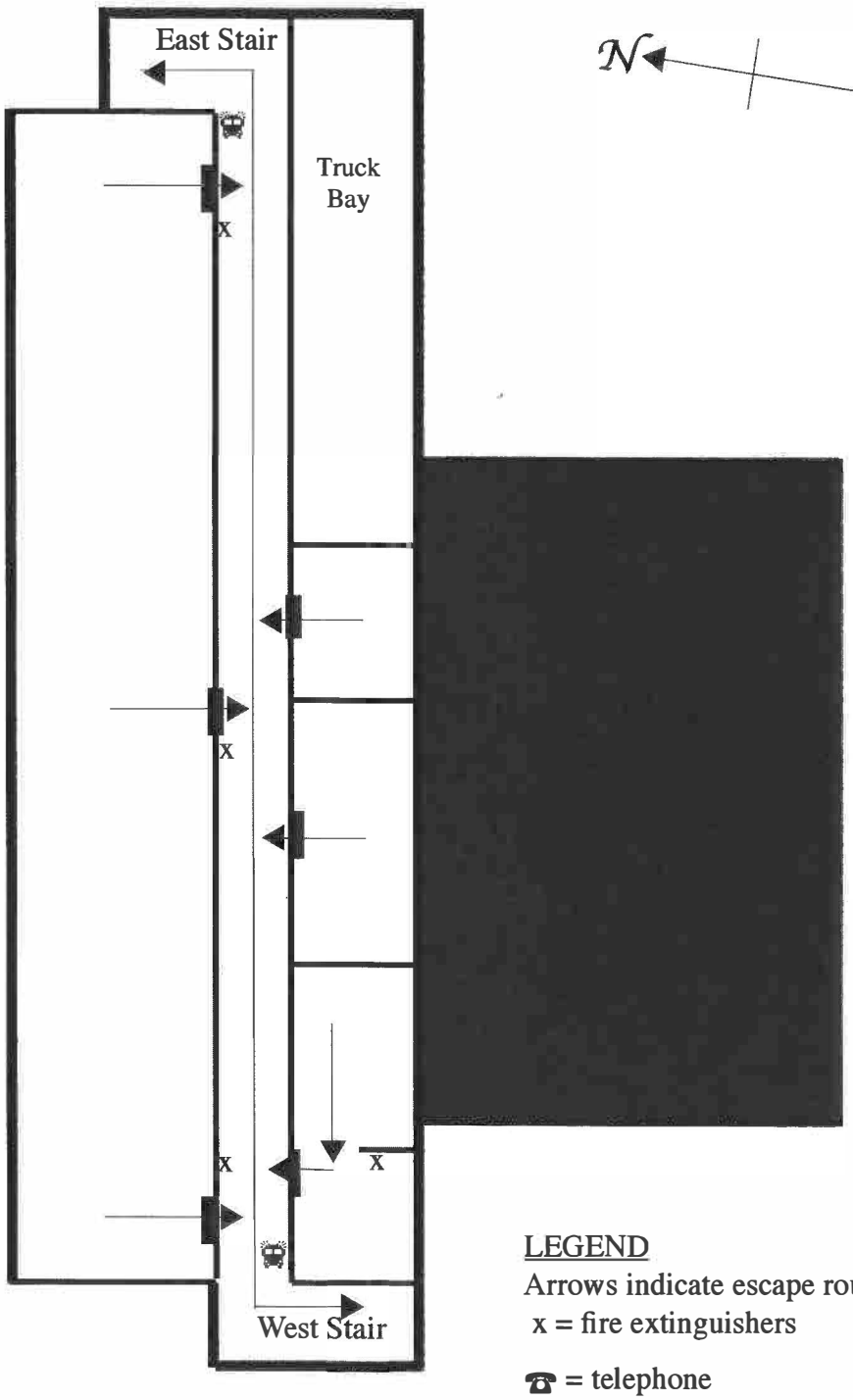

Evacuation Routes and Emergency Equipment Locations
Second Floor
Environmental Safety Facility
University of Vermont

LEGEND
Arrows indicate escape routes
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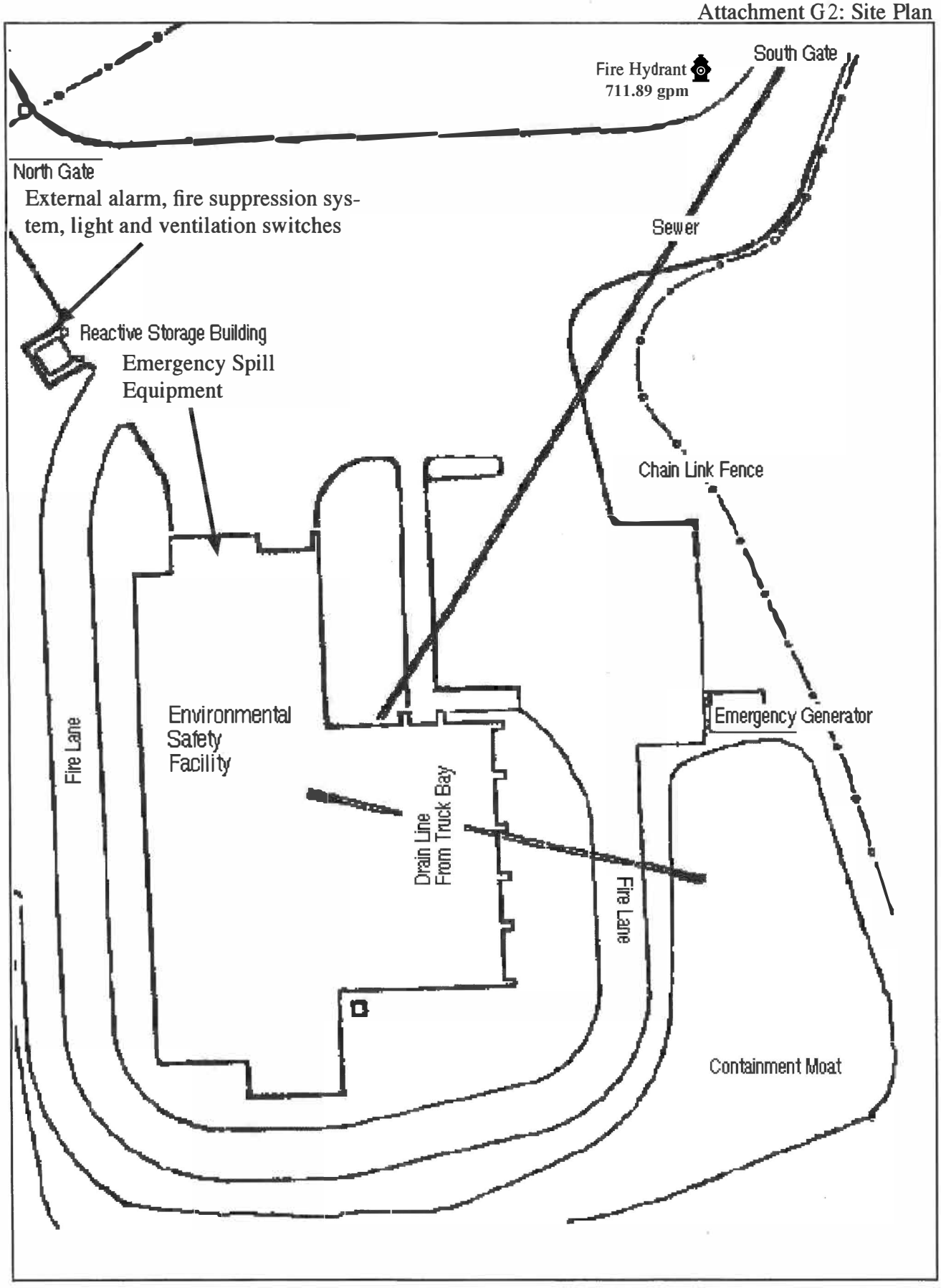
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Emergency Spill Equipment
Chain Link Fence
Environmental Safety Facility
Emergency Generator
Fire Lane
Drain Line From Truck Bay
Fire Lane
Containment Moat

Attachment G-3

Properties of Hazardous Waste Stored at the ESF

Properties of Hazardous Waste Stored at the ESF

The ESF receives waste chemicals from all of UVM's laboratories. At any point, the ESF will store waste from between 1,000 and 5,000 chemicals. Most of these are in laboratory amounts (less than 1 gallon, less than 1 pound). The following table, extracted from Prudent Practices in the Laboratory summarizes the types of waste, along with the associated hazards and types of injuries or illnesses that could result from fires, explosions, or releases at the facility.

Type of Waste	Hazardous properties, injury or illness that could result from exposure to chemicals involved in fires, explosions, or releases at ESF
Flammable Liquids and Gases	Flammable liquids and gases readily catch fire and burn in air. Containerized flammable liquids may boil or become pressurized in a fire and vent explosively with either a spout of flame or shrapnel from the container. These can cause serious tissue burns. Superheated vapors can be inhaled causing excessive burns to the respiratory system.
Flammable Solids	Flammable solids readily catch fire and burn in air, often with intense heat. These are often difficult to extinguish and can cause deep tissue burns.
Pyrophoric or Spontaneously Combustible Materials	Pyrophoric chemicals react with the air to catch fire, or release a toxic, flammable or corrosive gas. These can cause temperature burns, corrosive burns, asphyxiation or other toxic effects.
Water Reactive	Water reactive chemicals react with water (including excessive humidity in the air) to catch fire, or release a toxic, flammable or corrosive gas.
Oxidizing Agents	Oxidizing agents may react violently when they come into contact with reducing agents and sometimes with ordinary combustibles. The resulting fire or explosion can cause serious burns.
Corrosive Materials	Corrosive materials are acids (pH less than 2.0) and bases (pH>12.5). These can cause destruction of living tissue by chemical action at the site of contact and can be solids, liquids or gases. Corrosive effects can occur on the skin and in eyes, as well as in the respiratory or gastrointestinal tract. Corrosive effects can happen rapidly. Some materials, such as hydrofluoric acid, are specific to the materials they target, making emergency decontamination difficult. Many oxidizing agents also have corrosive effects.
Toxic – Irritants	Irritants are non-corrosive chemicals that cause reversible inflammatory effects.

Toxic – Allergen	Chemical allergies can result from low-level exposures to chemicals, following previous sensitization. Allergy-related symptoms can range from mild skin irritation to chemical pneumonitis and anaphylactic shock. Allergy symptoms can present soon after exposure or can be delayed.
Toxic – Asphyxiant	Asphyxiants prevent oxygen from getting into the body (simple asphyxiants) or prevent oxygen from getting to organs and tissue once inside the body (chemical asphyxiants).
Toxic – Carcinogens, Reproductive & Developmental toxins	Carcinogenic materials cause, or are suspected to cause, cancer or uncontrolled cell growth. Mutagens cause mutations in cell growth. Teratogens cause birth defects in the offspring of the exposed individual. Reproductive toxins may target the male or female reproductive systems resulting in adverse effects on fertility, gestation, lactation or reproductive performance. Developmental toxins produce adverse effects on the development of an embryo or fetus.
Toxic – Neurotoxin	Neurotoxins target the central nervous system (brain, spinal cord, neurotransmission, cerebrospinal fluid) or the peripheral nervous system (nerves and neurons). Neurotoxic effects range from slurred speech and headaches to neuropathy, paralysis and death.
Toxic – Toxins affecting specific organs or systems	Specific chemicals can target and disrupt the function of the kidneys, liver, blood formation system and other body systems and organs.

Prudent Practices in the Laboratory, National Academy Press 1995,
Chapter 3: Evaluating Hazards and Assessing Risks in the Laboratory

The general hazards described in the above table do not account for routes of exposure, duration or frequency of exposure, concentration of chemical, or the hazards of mixed chemicals. A chemical may be expected to have more than one hazard (i.e. flammable and toxic). Those factors, along with the acute and chronic affects of exposure, need to be considered in any hazard analysis.

Hazard information about a specific chemical involved in an event will have to be researched. Whenever possible, three sources of information should be consulted. These sources can include material safety data sheets, a chemical dictionary, The Merck Index, Prudent Practices in the Laboratory, and A Comprehensive Guide to Hazardous Properties of Chemical Substances (Patnaik).

Attachment G-4

Example Spill Report Form

Spill Report Form

Vermont Agency of Natural Resources
Department of Environmental Conservation
Waste Management & Prevention Division

VERMONT

DEC Spill Number: Date of Release:
Company Preparing Report: Company Contact:

Release Location	Responsible Party
Property Name:	Name:
Street Address:	Mailing Address:
Town: Zip:	Town: Zip:
Contact Person:	Contact Person:
Contact Phone:	Contact Phone:
Contact Email:	Contact Email:

Release Information (check all that apply)		
☐ Aboveground Storage Tank	☐ Residential	**Product Type:**
☐ Underground Storage Tank	☐ Commercial/Industrial	☐ #2 Heating Fuel
☐ Vehicle Accident	☐ Surface Water	☐ Kerosene
☐ Hydraulic Equipment	☐ Indoor Air	☐ Diesel Fuel
☐ Fire	☐ Free Product	☐ Gasoline
☐ Railway	☐ Other:	☐ Waste Oil
☐ Improper Disposal/Poor Housekeeping		☐ Hydraulic Oil
Estimated Quantity of product released:		☐ Other:

Receptor Information					
YES	**NO**		**YES**	**NO**	
☐	☐	Water Supply Well On-site	☐	☐	Drinking Water (DW) Impacted
☐	☐	Municipal Water Supply	☐	☐	Indoor Air (IA) Impacted
☐	☐	Leachfield potentially at risk	☐	☐	Surface Water Impacted
☐	☐	Surface Water Protection Area	☐	☐	Groundwater (GW) Impacted
☐	☐	Groundwater Source Protection Area	☐	☐	Drainage impacted
☐ Other:					

Corrective Actions Performed (check all that apply)	
☐ Free Product Recovery ☐ Vacuum Truck ☐ Drums ☐	Quantity Recovered (units): ☐ Absorbents (ongoing) ☐ Over/under dam
☐ Soil Excavation*	Quantity Excavated (units):
☐ Soil Stockpiling*	Stockpile Location:
☐ Soil Disposal* ☐Drums ☐Truck	Disposal Location: ☐Roll-off
☐ Other Spill Waste: ☐Shipped for disposal	☐Onsite Awaiting Disposal
☐ Vapor Abatement ☐Sub-slab vent ☐Indoor Air	☐ Surface Water Protection/Containment ☐Sorbent boom/pads ☐Hard boom

*Unless performed under emergency response, a Soil Management Plan is required per §35-804

Waste Management & Prevention Division
1 National Life Drive – Davis 1
Montpelier, VT 05602-3704
(802) 828-1138
www.vermont.gov/waste-management/spills

Investigation Measures Performed (check all that apply)		
☐ Soil Borings Advanced: #	☐ MWs Installed: #	☐ Test Pits: #
☐ Soil Samples: #	☐ GW Samples: #	☐ DW Samples: #
☐ PID screening	☐ IA Screening/Sampling	☐ Notes/other:

Attachments (as applicable, consult §35-503 if relating to a heating fuel release)		
☐ Site Plan(s) incl PCS location	☐ Laboratory Analytical Report(s)	☐ Field Screening Results
☐ Site Photos	☐ Disposal Receipts	☐ Boring/MW Log(s)
☐ Tabulated Analytical Data	☐ Daily Work Sheet(s)	
☐ Other:		

Release Response Summary and Conclusions

Recommendations (Check all that apply)			
☐	§35-505 Additional Site Investigation	☐	Contaminated soil excavation
☐	Vapor intrusion evaluation	☐	Soil vapor extraction
☐	Groundwater investigation	☐	Spill Closure
☐	Drinking water sampling	☐	Soil Disposal
☐	Disposal of drummed waste	☐	Other (specify)

Spill Report Form Directions

This form and attachments may be submitted to the Vermont Agency of Natural Resources, Department of Environmental Conservation, Waste Management & Prevention Division, Spill Program to document initial and potentially follow-up response actions conducted to address releases of hazardous materials. When a response summary is required by §35-503 of the Investigation and Remediation of Contaminated Properties Rule or if response costs are eligible for reimbursement through the Petroleum Cleanup Fund, this form must be submitted to the Spill Program unless the consultant/contractor instead submits a proprietary report. Completed forms may also be submitted with a proprietary report.

Release Location: Enter the physical address where the release occurred. Contact information requested is for the on-site contact, which may not be the Responsible Party.

Responsible Party: Enter the name and contact information for the person or entity that is responsible for the release.

Release Information: Enter the general information that is applicable to the release; including source, setting, and type and quantity of material released.

Receptor Information: Enter the information pertaining to impacted sensitive receptors as known.

Corrective Actions Performed: Enter the information for corrective actions that were undertaken to address the release. Include waste disposal or treatment information.

Investigation Measures: Enter the information about investigation work performed, including field screening results, the collection of environmental media samples for laboratory analysis, and/or the advancement of soil borings and installation of monitoring wells.

Attachments: Include documentation that supports the information entered on the Spill Report Form. When the form is being submitted to document the Initial Release Investigation required by §35-503, tabulated analytical results (i.e. lab data, PID table, etc.) site plan, photos, laboratory report(s), and disposal receipts ARE REQUIRED. Additional details are provided below:

> Analytical results: Tabulated analytical results with direct comparison to environmental media standards are required by §35-503(3). For other reporting efforts, attaching complete laboratory reports is acceptable.
>
> Site plan(s): Should depict the location of the release (UST, AST, pipe, etc.), extents of buildings in the vicinity, soil stockpiles, and monitoring points or systems installed. Extents of soil excavation(s) should be included as well.
>
> Waste disposal documentation: If still pending, indicate in Summary the anticipated date on which the documents will be provided to the Spill Program.

Release Response Summary and Conclusions: Provide a brief narrative description of the site, property history, release, response actions completed, and conclusions. If more space is needed, submit a separate narrative document along with the completed form.

Recommendations: If there is a recommendation for additional response or investigation and the options are not presented with a check box, include the recommendations in the summary narrative component of the form.

Appendix H

Training Plan
And Job Descriptions

Introduction

The University of Vermont (UVM) operates the Environmental Safety Facility (ESF), a hazardous waste treatment and storage facility at 667 Spear Street in Burlington, Vermont. UVM has prepared this plan in accordance with VHWMR 7-309.

Training Program Content, Frequency and Techniques

The training program in place for ESF personnel ensures that they know how to operate and maintain the ESF in a safe manner. The program consists of both introductory and continuing training and includes on the job as well as classroom training. New employees will complete their introductory training within six months of their first day of work at the ESF. Trained ESF staff will closely supervise new employees until they successfully complete their initial training. Introductory training includes instructions, descriptions and demonstrations of daily operations including, as appropriate:

- Emergency systems, alarms and communication systems;
- Emergency response procedures including response to fires and ground water contamination incidents, where applicable;
- Inspecting, repairing and replacing ESF emergency and monitoring equipment;
- Internal waste tracking instructions;
- Container management;
- Waste packing; and
- Waste stream verification.

ESF Chemical Handling and Emergency Response Staff receive a 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training, which meets the requirements of 29 CFR 1910.120. Other ESF personnel receive, at a minimum, HAZWOPER Awareness Level Training which meets the requirements of 29 CFR 1910.120.

ESF personnel participate in annual training relevant to their position. This training is provided through qualified internal personnel or through contractors who specialize in various aspects of the hazardous waste management field. The program must be directed by a person trained in hazardous waste procedures.

Topics included in a typical annual training program are listed below. Similar timely and equivalent information is presented each year. Training is reviewed annually.

- Implementation of the Contingency Plan (Appendix G)
- Chemical Safety and Toxicology
- Personal Protective Equipment and Respiratory Protection
- Emergency Procedures
- RCRA and DOT Regulations
- Waste Minimization
- OSHA HAZWOPER (29 CFR 1910.120) refresher training

Job Description for ESF Chemical Handling and Emergency Response Staff

All ESF chemical handling and emergency response personnel have an appropriate level of training and experience or education to adequately perform the tasks described below:

Basic Function
To manage the UVM Hazardous Waste Management program in accordance with applicable state and federal regulations. Train the campus community in the relevant hazardous waste laws and regulations including proper disposal of waste materials and minimization techniques.

Characteristic Duties/Responsibilities

- Manage ESF, including inventory and daily inspections.
- Pickup, label, and transport waste chemicals in accordance with all applicable local, state, and federal regulations.
- Prepare waste for proper disposal.
- Respond to chemical spills and releases.
- Implement Contingency Plan (Appendix G)
- Maintain records related to program activities including hazardous waste manifests and other documents required as part of the ESF operating record.
- Serve as a liaison with agencies regulating hazardous waste.

Transportation
ESF personnel required to drive the hazardous waste transport vehicle as part of their job duties will attend a training course for hazardous materials/waste transporters. They are also required to maintain a Commercial Driver's License (CDL) with HAZMAT endorsement.

In addition, any employee who is required to drive a UVM vehicle must complete UVM's Driver Training and Certification program.

ESF Job Titles & Descriptions Relating to Hazardous Waste

Title:	Environmental Compliance Manager, or equivalent
Job Description:	Provide regulatory and technical oversight for hazardous waste operations and coordinate emergency response to chemical spills and releases. Ensure site security, proper building maintenance and conduct daily/weekly inspections as needed.
Title:	Director of Environmental, Health, and Safety, or equivalent
Job Description:	Coordinate emergency response to chemical spills and releases. Ensure site security, proper building maintenance and conduct daily/weekly inspections as needed.
Title:	Environmental Safety Technician, or equivalent
Job Description:	Collect, transport, package and consolidate hazardous waste. Additionally, arrange, schedule, and oversee end disposal shipments and coordinate emergency response to chemical spills and releases. Ensure site security, proper building maintenance and conduct daily/weekly inspections as needed.
Title:	Safety Professional (Laboratory or Occupational Health/Safety) or similar
Job Description:	Provide safety and environmental management system training and oversight to campus users of hazardous materials, and coordinate emergency response to chemical spills and releases. Ensure site security, proper building maintenance and conduct daily/weekly inspections as needed.

Recordkeeping

The following training information is kept as part of the ESF's operating record:

- Job titles and the names of the employees filling those positions;
- Written job descriptions;
- Descriptions of introductory and continuing training, and;
- Records that document the training received by personnel.

Training records on current personnel are kept until closure of the facility. Training records on former employees must be kept for at least three years from the date the employee last worked at the facility.

Appendix I

Waste Analysis Plan

Waste Analysis Plan

Purpose
The purpose of this plan is to describe how wastes accepted at The University of Vermont and State Agricultural College's (UVM) Environmental Safety Facility (ESF) are identified, in order to safely manage them and arrange for proper final disposition. This plan assures compliance with applicable requirements found in 40 CFR 270.14(b)(2) and 264.13.

Introduction

All wastes accepted at the ESF go through an approval process based predominantly on "generator knowledge." The ESF primarily accepts waste from UVM, and its tenants and affiliates (referred to as "University personnel" or "UVM personnel" hereafter). UVM can also accept waste at the ESF from the generators not affiliated with the University that are listed in Appendix D. Procedures for waste analysis vary depending on whether the waste is generated by University personnel or not.

Waste Analysis Procedures for Wastes from UVM Personnel

The University of Vermont assumes generator status of all wastes from the activities of University personnel at the point of generation. The main activities generating UVM wastes are laboratory activities (teaching/research), on-going campus maintenance, and one-time facility projects.

Laboratory Waste
The majority of wastes accepted at the ESF are generated in UVM's research and teaching labs. These "laboratory wastes" consist of small containers (usually less than 4 liters) filled or partially filled with different types of laboratory chemicals. A substantial percentage of the University's laboratory waste is composed of surplus or excess unused chemicals still in the original containers with manufacturer labels describing the chemical constituents and their relative concentrations. Other laboratory wastes are typically mixtures of known materials generated as byproducts from activities performed by, or under the supervision of, qualified laboratory personnel. Occasionally, due to laboratory closures and errors in labeling or marking, some laboratory wastes are considered "unknowns." Procedures for managing and screening unknowns are outlined later in this Appendix (see "Procedures for Unknown Wastes"). A small portion of laboratory wastes are collected in containers greater than 5 gallons.

Facilities Waste (on-going maintenance and one-time projects)
UVM generates wastes from facilities maintenance and construction activities. Examples of facility wastes include, but are not limited to, oily debris, paint related materials and lead paint debris. UVM also generates used oil and universal wastes such as spent batteries, florescent lamps, mercury-containing devices, ballasts, and cathode ray tubes.

Waste Identification
ESF personnel typically rely upon the knowledge of the person creating a waste, not on laboratory analysis, to identify the hazardous constituents and/or characteristics of the waste (i.e., "generator knowledge"). The University personnel who control the processes and experiments

generating laboratory and facility wastes generally know, and can provide supporting documentation of, the chemical components used.

University personnel identify and communicate chemical constituent information to ESF personnel by filling out a waste tag for each container of waste generated. Waste tags include contact information, general waste information (i.e., physical state and quantity/amount) and the chemical constituents or appropriate waste profile. Waste profiles are used in cases where certain waste streams are frequently generated. The waste profiles are generated by ESF personnel, based on disposal and shipping requirements. Laboratories are only allowed to use these profiles if the wastes generated match the constituents and characteristics provided in the profile or contain only constituents that are chemically and reactively similar.

Each waste tag, with its unique identification number, is entered into an on-line tracking system, along with the waste-specific information provided on the tag.

The generator knowledge provided to the ESF by UVM personnel has been excellent since the ESF began accepting waste in 1994. ESF personnel routinely communicate the importance of accurate generator knowledge and proper waste identification procedures to University personnel using the following methods:

- Regular classroom training provided by ESF personnel
- Regular ESF inspections/audits of laboratories and other UVM waste-generating activities
- On-line training and reference material available to all University personnel
- Printed reference material available to all University personnel
- Frequent interaction between ESF personnel and University personnel

UVM's waste management system provides no incentives for University personnel to mismanage waste or withhold information from ESF personnel.

Commercial TSDFs that accept waste from un-affiliated off-site generators cannot rely solely on "generator knowledge" for hazardous waste identification information because those generators may: 1) have a financial incentive to "downplay" the hazardous nature of a waste; 2) rely on TSDF representatives or a third party to complete waste profile information based on limited process and/or waste constituent information; 3) have a poor understanding of applicable state/federal hazardous waste regulations. Since UVM already owns its waste, UVM personnel do not have a financial incentive to improperly describe waste being sent to the ESF. In addition, ESF personnel are familiar with most waste generating processes conducted by UVM personnel and can follow-up immediately with the individuals responsible for generating waste to resolve waste identification questions.

Waste Pickup and Verification

Once waste is ready for removal by the generator, the generator submits an online request for waste pickup. Once the request is received, ESF personnel collect tagged waste from UVM campus locations. As wastes are collected, ESF personnel inspect the waste containers and their contents to verify that the wastes visually conform to the information on the tag. Wastes that do not visually conform to the expected waste in the container undergo additional review with the

generator. ESF personnel will attempt to resolve the discrepancy by communicating with University personnel at the time of the waste pickup. If the discrepancy is resolved, the information is corrected on the tag and in the database, and the waste is accepted.

If the ESF personnel cannot visually verify a waste at the time of pickup and no University personnel are present, the container will be left under the control of the person or group that generated the waste, until sufficient information can be gathered. When campus safety or security is of concern, main campus wastes may be moved to the short-term storage area until sufficient information can be gathered.

If sufficient waste information is not available and cannot be obtained, ESF personnel will follow the procedures for managing and screening unknowns outlined later in this Appendix (see "Procedures for Unknown Wastes").

In addition to visually inspecting waste, ESF personnel regularly field test liquid wastes to verify the pH and oxidation potential. These tests are performed at the time of pickup or upon arrival at the short-term storage area, and results are compared to the waste tag information and recorded on the physical tag attached to the chemical container. Any discrepancy between tag information and field verification results in a communication between ESF personnel and the person or group who generated the waste.

In any instance where waste is non-conforming or is not managed appropriately, ESF personnel communicate with the person or group who submitted the tag information, investigate the waste identification procedures used, and re-emphasize the importance of proper waste identification and management. When ESF personnel observe repeated instances of incorrect or inadequate tag information, they will address this performance issue with the generator and supervisor(s), as appropriate. If the problems are not resolved, they will be handled through the oversight procedure in UVM's Environmental Management Plan.

Short-term Storage Operations and Waste Verification

ESF personnel operate the UVM on-campus short-term storage area. The primary function of the short-term storage area is to receive wastes from main campus locations, evaluate tag and label information for the purpose of making hazardous waste determinations, and provide short-term storage prior to transfer to the ESF.

In most cases, wastes generated from on-campus activities are transported to the campus short-term storage area. Once received, waste containers are segregated into compatible groups, labeled and, if appropriate, marked with applicable EPA and Vermont hazardous waste codes.

When waste is not generated on main campus, ESF personnel accept wastes and transport them directly to the ESF, instead of the short-term storage area. The same waste labeling/tagging and waste verification/determination procedures apply for wastes not generated on main campus.

ESF Operations and Waste Verification
Prior to accepting wastes at the ESF, ESF personnel have verified that the wastes conform to tag and label information and have determined if the wastes are hazardous according to the procedures described above.

At the ESF, many wastes are consolidated, or "bulked," with other compatible wastes into larger containers. Prior to bulking any waste, ESF personnel re-examine waste tag information to ensure that all wastes to be bulked are compatible with each other and the container. After reviewing the tag information, a small amount of each waste to be bulked is poured into a bucket to further ensure waste/container compatibility. Throughout this process, any discrepancy noted results in a review of relevant tag and process information related to the waste to determine where the error in identification occurred. Additional follow up is provided to the generators, as necessary.

End Disposal Verification
ESF personnel prepare hazardous waste profiles for all hazardous wastes prior to shipping them to commercial end disposal facilities. Those disposal facilities are required to perform waste analysis on UVM wastes, according to their TSDF permit procedures. If they inform UVM of a discrepancy, ESF personnel review relevant tag and process information related to the waste to determine where the error in identification occurred. A communication from ESF to the person or group who made the error will re-emphasize the importance of proper waste identification.

Waste Analysis Procedures for Wastes from Generators Not Affiliated with UVM

In order to assist local governments in managing household waste and waste from very small quantity generators in their communities, the ESF allows several generators to ship hazardous waste to the ESF. Refer to Appendix D for a complete listing of accepted source generators. While UVM is required to be available to accept these wastes, they are typically managed by the local solid waste district. The following procedures are designed for those situations when UVM accepts wastes from generators not affiliated with UVM.

Non-UVM generators must complete a Waste Profile (Attachment I-1) and submit this to the ESF for approval. ESF personnel will approve or reject the waste based on information provided in the profile as well as any additional information that may be necessary to properly identify the waste (sample, SDS, etc.). Only approved wastes can be shipped to the ESF. ESF personnel maintain the right to reject hazardous wastes from off-site generators at any time.

Wastes received at the ESF from off-site generators are transported by a Vermont-certified hazardous waste transporter and must be accompanied by a uniform hazardous waste manifest or, if appropriate, a standard bill of lading. If applicable, completed Land Disposal Restriction notifications must also be provided. In all cases, the off-site generator's EPA ID# must be included on the shipping document.

To ensure quality control, every non-labpack container received at the ESF from "Non-UVM" generators will be visually inspected to verify the information on the waste profile and checked

for pH and oxidation potential. One of every ten non-labpack containers will be randomly sampled for analysis by an independent, NELAP certified laboratory to verify profile information. Results of the analysis will be compared to the approved Waste Profile. If the analysis results differ from the profile, ESF will work with the generator to resolve the discrepancy. Additional wastes from the shipment may be sampled and analyzed. If obvious discrepancies remain, ESF may return all hazardous wastes from the shipment to that generator.

Procedures for Characterizing Unknown Wastes

Wastes will be classified and tagged as "unknowns" when generator knowledge is insufficient for purposes of making a hazardous waste determination. ESF personnel or a contracted waste management firm will screen unknowns prior to shipping the wastes. In addition to screening unknown wastes, samples of the wastes may be taken for further testing and analysis. Characterized unknowns will be lab packed and sent for disposal.

Screening does not always specifically identify the unknown material being tested, but is used to accomplish the following three objectives:

1.) Determine the compatibility of unknown materials to safely labpack or consolidate them.
2.) Determine any dangerous properties of a material to ensure safe transportation and storage.
3.) Determine if the material exhibits any hazardous waste characteristics to ensure proper disposal.

Materials believed to be reactive or contain unstable peroxides produced by the decomposition of organic solvents will not be screened. These will be individually packed, handled, stored, and managed as reactive wastes as described in the container management plan (Appendix E).

Screening Methods for Characterization of Unknown Wastes
The following analytical parameters and test methods may be used for wastes stream identification on unknown wastes prior to shipment to the ESF:

- Physical description - including liquid - solid - sludge content, water layer, color, and viscosity - an inspection of the general wastestream is used to determine its suitability for consolidation and consistency with tag and label information.
- pH - used to determine the corrosivity of the waste by using a pH indicator strip which measures waste stream as a strong acid, moderately acidic, weak acid, neutral, moderately basic, or a strong base.
- Oxidizer screen - used to determine if the waste is an oxidizer having the potential to react with a wide range of waste streams. The test method uses a potassium iodide-starch, or equivalent, indicator strip that turns color if the waste is an oxidizer.
- Reactive Cyanides - used to determine if the waste would produce hydrogen cyanide if mixed with a strong acid by using a hydrogen cyanide indicator strip and reagents.
- Reactive Sulfides - used to determine if the waste would produce hydrogen sulfide if mixed with a strong acid by using a hydrogen sulfide indicator strip and reagents.
- Water reactivity - used to determine whether the waste has the potential to react with water to generate heat, flammable gases, or other products. Water reactivity is determined by adding approximately 3 mls of water to 1/10 ml of liquid or 1/10 gm of solid. If there is gas evolution or a significant rise in temperature the test is considered positive.
- Peroxides - used to determine if the waste contains explosive peroxides. If there are crystalline solids on or in a container that is suspected to contain a peroxide-forming compound, the container will not be opened, and the peroxide test will be assumed positive. The test uses peroxide indicator strips.

- Ignitability - used to indicate the fire-producing potential of the waste and determines whether the waste is RCRA ignitable. A closed crucible ignitability screening test may be used. A closed cup flash test is used to determine the flash point of wastes if necessary.
- Specific gravity - used in conjunction with other test data to determine whether the waste conforms to generator supplied data. A hydrometer is used to determine specific gravity.
- Lead - used to indicate whether the waste is RCRA hazardous due to lead toxicity by using a colorimetric strip and an acetic acid reagent.
- Chlorine - used to indicate if the waste is chlorinated. This information is used to determine disposal options. The test uses either colorimetric test strips or flame color.
- Organic solvents - used to indicate if the waste contains organic solvents. This information is used to determine disposal options. This test uses colorimetric test strips.
- Arsenic - used to indicate whether the waste is RCRA hazardous due to arsenic toxicity by using colorimetric strips.
- Compatibility - used to verify compatibility of liquid or sludge waste prior to commingling with other wastes. A representative sample of the waste to be consolidated is mixed with a representative sample of the wastes with which it will be commingled. If any reactions are observed, the wastes are considered incompatible and will not be commingled.

Results from the screening of unknowns are recorded on a characterization sheet and attached to the hazardous waste manifest.

Attachment I-1

Waste Profile

The UNIVERSITY of VERMONT
University of Vermont - Environmental Safety Facility
667 Spear Street, UVM-ESF, Burlington, VT 05405
Tel: 802-656-0767

ESF USE ONLY
Approved Profile # _____
Management Code: _____
Date: _____
Approved by:

Waste Profile for Non-UVM Generators of Hazardous Waste

1. Generator Information

Name: _____

U.S. EPA ID #: _____

Site Address: _____

Mailing Address: _____

Contact Name: _____ Phone #: _____

Generator type
(Check One)
☐ City of Burlington VSQG
☐ Chittenden Solid Waste District
☐ Primary/Secondary School

2. Waste Description

Common Name of Waste:
_____
_____

Process Generating Waste:
_____
_____
_____

Source of Waste (check one)
☐ Unused chemical
☐ Process waste by-product
☐ Spill clean-up
☐ Lab pack
☐ Other: _____

Form Code: _____
Source Code: _____

Waste Composition SDS attached? ☐ Yes ☐ No

Chemical Name	Concentration	Units	CAS#

Metals
(☐ Total, ☐ TCLP)
Arsenic: _____
Barium: _____
Cadmium: _____
Chromium: _____
Lead: _____
Mercury: _____
Selenium: _____
Silver: _____

Air Reactive	☐
Asbestos	☐
CFC	☐
Dioxins	☐
Explosive	☐
Gas	☐
Halogens	☐
Infectious	☐
PCB	☐
Strong odor	☐
Water Reactive	☐

3. Physical Properties (at 25°C or 77°F)

Physical State:
☐ Solid
☐ Liquid
☐ Semi-solid (pumpable? Y/N)
☐ Gas

Number of Phases:
☐ 1 ☐ 2 ☐ 3

%: Top ___ Mid ___ Bot ___

Viscosity:
☐ low (water)
☐ med (oil)
☐ high (molasses)

Specific Gravity:
☐ < 1
☐ 1
☐ >1

Flash Point:
☐ <100°F
☐ 100 – 140°F
☐ >140°F

Boiling Point: ☐ <100°F ☐ >100°F

pH: _____

4. Manifest Information

Is this a DOT Hazardous Material? ☐ Yes ☐ No

Proper DOT Shipping Name: _____

Hazard Class: _____ ID number: _____ PG: _____ RQ: _____

EPA Waste Code(s): _____

5. Generator Assurance

I certify that the information provided regarding this hazardous waste, including this profile, any sample submitted or additional conversations is accurate.

This information is based upon ☐ **Process knowledge** ☐ **Waste analysis** (check one).

_____
Signature Printed name Date

Appendix J

University of Vermont
Environmental Safety Facility
Inspection Plan

Inspection Plan

The Environmental Safety Facility (ESF) inspection plan is designed to detect malfunctions, deterioration, operator errors or discharges that could result in a release of hazardous waste constituents into the environment or pose a threat to human health.

All ESF staff members are trained in the use of the Daily Inspection Checklist and the Weekly Inspection Checklist included in this section. This training includes instruction on how to perform inspections, inspection recordkeeping procedures, procedures for corrective actions, and documented follow-up. Daily inspections are recorded every day that ESF personnel are normally scheduled to be on site. The inspection checklists are maintained at the ESF.

Daily Inspection

ESF staff members will perform a daily inspection of the main ESF building, Reactives Storage Building and grounds.

Any indication of unusual odors, possible spills or leaks, inadequate aisle space between drums, container defects or mechanical problems will be immediately reported to other ESF staff members who will promptly assist in investigating the problem. If necessary, the contingency plan will be implemented. The UVM Physical Plant Department will be notified if there are any mechanical problems.

Example Daily Inspection Walkthrough:
Upon entering the waste storage area, the ESF staff member (inspector) checks the truck bay for any noticeable problems such as spills, unusual odors, or unsecured waste containers. The containment sump control valve is checked to make sure that it is in the closed position; a sign in the truck bay indicates the open and shut positions. Power to the truck bay door is switched off to lock the door. The switch it located adjacent to the overhead door.

The inspector proceeds into the chemical workroom (room 109). This room is checked for evidence of spills or releases, the presence of required safety equipment, and the integrity and inventory of waste containers. Drums stored in this room may be partially filled drums that are awaiting further consolidation or lab packing. Other drums stored in this room may be drums that are stored in the pouring station following consolidation activities. Containers may also be stored in this room when they are staged for a scheduled shipment to an off-site TSDF.

The inspector checks the rooms where wastes are stored, including rooms 110, 111, 112, 113,116, 118, 119, and 120; as well as rooms 115, 115-A, 115-B, and 117 where virgin product, and laboratory chemicals are stored. While inspecting each storage room for leaking or deteriorated containers, the inspector also takes a drum inventory to compare with the Emergency Response Inventory that is posted at the entrance of the facility. The barrel count also confirms that the maximum storage capacity of each room (twenty, 55-gallon drums or the equivalent) has not been exceeded. The exterior doors in the storage rooms are checked to confirm that they are locked and the lights in the hallway and in each storage room are inspected to ensure that they are functioning properly.

The second floor rooms 200 (heating), 201 (storage), 201-A (fan room), 202 (mechanical room) and EF-1 (fan room) are checked for water leaks, odors and odd mechanical noises. The upper truck bay delivery doors are checked to confirm that they are locked. The inspector checks the stairwells to ensure that they are accessible.

The inspector checks the Reactives Storage Building for any evidence of chemical leaks or spills, water leaks, unusual odors, container defects, or mechanical problems. The inspector confirms that there is adequate aisle space and that the storage limit of the building (eight, 55-gallon drums or the equivalent) has not been exceeded. Finally, the inspector ensures that the door is locked (this should always be in the locked configuration) and closed.

The ESF Main Building exterior is inspected to ensure that exterior doors are locked (Note: the front door to the ESF may remain unlocked at the time of the inspection; this door is locked, and the security alarm is set, when the last ESF staff member leaves the ESF for the day). The inspector checks the fire alarm panel to be sure the power light is on and the trouble lights are off. The inspector also checks the security alarm to ensure that the power light is lit. The inspector compares the result of the reviewed inventory to the Emergency Response inventory and makes sure that the emergency response inventory is posted in the foyer. The inspector checks the communications system by activating the intercom to the waste storage area from the office area.

Throughout the inspection, the inspector observes the grounds and general building structures and systems for necessary maintenance or repairs. These include, but are not limited to, lighting, plumbing, snow removal, and housekeeping. Deficiencies in these areas, that do not increase the risk of a release of hazardous materials nor the threat to human health or the environment, may be remedied through UVM's general work order process and do not have to be documented on the inspection form.

After concluding a complete walk around the ESF and building exterior, the inspector fills out the daily inspection checklist and records any problems or corrective actions taken. Records of the daily inspection are retained at the ESF for three years, as part of the facility operating record.

Weekly Inspection

ESF staff members perform weekly inspections of safety showers, eyewashes, and emergency equipment. During the inspection, the safety showers are flushed in accordance with VOSHA regulations.

ESF staff members also check the emergency spill supplies specified in the Contingency Plan portion of this permit. These supplies are located in room 109 and in the East Stairwell of the ESF.

ESF staff members also inspect the retention pond on a weekly basis to assure the control valve is in the closed position. If the pond is holding water, it is drained. The retention pond control valve is returned to the closed position after draining. This process ensures that the valve is

operable. The exterior features of the building, including fences, gates, and lighting, are also checked.

Records of the weekly inspection are kept at the ESF for three years, as part of the facility operating record.

Fire Extinguisher Inspection
All fire extinguishers are inspected and tagged monthly by UVM's Department of Physical Plant to verify that they are charged and full, and to comply with Vermont Department of Labor regulations. Fire alarms and the main building sprinkler system are inspected and tagged annually in compliance with Vermont Department of Labor regulations. The dry chemical fire suppression systems in the pouring station and in the Reactives Storage Building are inspected semi-annually and tagged in accordance with Vermont Department of Labor regulations. The fire safety equipment are tagged to show current certification.

Additional Inspections
UVM's Electrical Department checks all exterior lights as part of the routine campus maintenance program and makes repairs as necessary. UVM's Grounds Department routinely maintains the lawns and vegetation in the moat; the use of chemical pesticides and herbicides is avoided. Preventative maintenance and repairs on air handling systems, heating systems, electrical, plumbing and other building operational systems are scheduled and performed by UVM's Department of Physical Plant.

At a frequency of every 10 years, to coincide with the permit renewal, the sump area beneath each waste storage room will be inspected to ensure that the epoxy-coated concrete is free of cracks or gaps and is sufficiently impervious to contain leaks and spills, so that it complies with 40 CFR§264.175. Records of these inspections, including the inspector's name, the date of the assessment, the method of the assessment and the results of the assessment will be maintained with the ESF permit.

Environmental Safety Facility Daily Inspection Checklist

This completed checklist is part of the facility operating record for three years following the inspection date.

Inspected by: _____

Inspection Date: _____

Inspection Time: _____

Deficient? Yes/No

Storage Areas
Chemical Releases (spills, leaks, odors): [] []
Water Leaks: ----------[] []
Container Defects/Deterioration: ------[] []
Aisle Space: ----------[] []
Labels (deficient if not visible): --------[] []

Spill Control Supplies
Inventory & Location (deficient if used and not replaced or if not in proper location):[] []

Truck Loading/Unloading Bay
Containment sump control: ----------[] []
Unsecured waste containers: ----------[] []
Evidence of spills or releases: ----------[] []

Communications
Internal Communications - cell phone: --[] []
On-site notification systems - fire alarm: [] []

Fire Equipment
Extinguishers (deficient if missing or discharged): ----------[] []
Alarm panel (deficient if power light is off or if trouble lights are on): ----------[] []
Emergency Response Inventory --------[] []

Security Check
Door Locks: ----------[] []
Reactives Building: ----------[] []
Fence & Gate: ----------[] []
Alarm (deficient if power light is off): ---[] []

Storage Room	Number of Containers	Visual Inspection Comments
109		
110		
111		
112		
113		
114, 115, 115A, 115B	(Non-waste)	
116		
117	(Nonwaste)	
118		
119		
120		
Reactives Storage Bldg		

Mechanical Rooms/Comments

200 (Heat)	
201 (Storage)	
201-A (Fan)	
202 (Mech.)	
EF-1 (Fan)	

Repair or Corrective Action for each item identified above as being deficient:

Deficiency	Repair or Corrective Action	Date/Time Completed

Environmental Safety Facility Weekly Inspection Checklist

This completed checklist is part of the facility operating record for three years following the inspection date.

Inspected by:_____

Inspection Date: _____

Inspection Time:_____

Safety Showers & Eyewashes

Flush Safety Showers and Eye Wash Stations.

Check when completed	Safety Showers	Eye Wash Stations
Chemical Workroom	❑	❑
West Hallway	❑	❑
Center Hallway	❑	❑
East Hallway	❑	❑
Chemical Distribution	❑	❑
Laboratory Drench Hose	❑	

Emergency Spill Supplies

Check that spill supplies, as specified in Contingency Plan are in proper locations.

Supplies in room 109 Yes ❑ No ❑

Supplies in East Stairwell Yes ❑ No ❑

Truck Bay

Valve is operable and left closed Yes ❑ No ❑

Heat is on (November – March) Yes ❑ No ❑

Exterior Inspection

Retention Pond Control Valve

Inspected and drained if there is standing water. Yes ❑ No ❑

Pond valve operable & returned to closed position? Yes ❑ No ❑

Perimeter fence intact? Yes ❑ No ❑

Exterior lights intact? Yes ❑ No ❑

Repair or Corrective Action for each item identified above as being deficient:

Deficiency	Repair or Corrective Action	Date/Time Completed

Appendix K

Closure Plan and Closure & Liability Insurance

Introduction

The University of Vermont and State Agricultural College (UVM) operates the Environmental Safety Facility (ESF), a hazardous waste treatment and storage facility at 667 Spear Street in Burlington, Vermont. UVM has prepared this closure plan, including a cost estimate for all closure activities, in accordance with UVM's Hazardous Waste Storage Facility Permit, Vermont Hazardous Waste Management Regulations (VHWMR) Sections 7-309(c) and 7-504(e), 40 CFR Part 264 Subpart G (facility closure) and Section 264.197 (tank closure), and 40 CFR Part 761.

This closure plan will be implemented if final closure of the entire facility becomes necessary. If closure of individual hazardous waste management units or areas of the facility becomes necessary, UVM will implement those provisions of this closure plan that are applicable to the unit(s) being closed. Such partial closures may be necessary due to equipment, changes in regulatory requirements, modifications of operations, or replacement of permitted units or portions of permitted units during the operating life of the facility. Partial closure of a portion of a hazardous waste management unit would proceed in the same manner described herein for final closure of the entire unit, with respect to removal of inventory and residues, as well as decontamination of equipment and structures and verification sampling and analysis. The closure activities discussed herein are intended to achieve clean closure of the facility or the unit(s) being closed.

Closure Plan and Closure Performance Standard

The purpose of this plan is to identify the steps necessary to perform partial and/or final closure of the UVM ESF. Appendix B provides a description of the hazardous waste management unit that is subject to closure. Until closure is completed and certified, a copy of the original approved closure plan, and all approved revisions of that plan, will be maintained as part of the UVM ESF operating record.

Partial Closure
The ESF is considered a single hazardous waste management unit. UVM does not anticipate a request for partial closure as all hazardous waste operations at the ESF are anticipated to cease at the time of final permit closure.

Post Closure Plan
The ESF is not a hazardous waste disposal facility, nor does it operate a waste pile, surface impoundment, or tank system. Hazardous waste will not remain on site, nor will access to the site pose a hazard to the public or domestic livestock, after the ESF has been closed. Therefore, a post closure plan, to include an inspection plan, and monitoring plan as identified in 40 CFR§264.117, is not required.

Amendment of the Closure Plan

UVM shall submit a written request for certification modification to authorize a change in the approved closure plan. The written request shall include a copy of the amended closure plan for approval by the Secretary of Natural Resources.

UVM may submit a written request to the Secretary for a certification modification to amend the closure plan at any time prior to notification of final closure of the ESF.

UVM shall submit a written request for certification modification to authorize a change in the approved closure plan whenever:

1. Changes in operating plans or facility design affect the closure plan; or
2. There is a change in the expected year of closure, if applicable; or
3. In conducting partial or final closure activities, unexpected events require a modification of the approved closure plan.

UVM shall submit the written request for certification modification including a copy of the amended closure plan to the Secretary:

In order to modify this closure plan, UVM will submit a written request to the Vermont Department of Environmental Conservation, Waste Management Division Director. Any written request for modification of the closure plan will include a copy of the amended plan with all changes clearly identified (e.g., underline / strikeout). The request will be submitted for approval at least 60 days prior to the proposed change in facility design or operation, or no later than 60 days after an unexpected event has occurred which has affected the closure plan. If an unexpected event occurs during the closure period, the request for modification will be made no later than 30 days after the unexpected event. In addition, a verbal notification will be made to the Waste Management Division Director within 24 hours of an unexpected event has occurred which affects the plan.

Closure Performance Standard

In the event that UVM must close the ESF, this plan identifies steps needed to close the ESF in manner that:

1. Minimizes the need for further maintenance by controlling, minimizing, or eliminating, to the extent necessary to protect human health and the environment, the post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the groundwater or surface waters or to the atmosphere; and

2. Removes or decontaminates all contaminated equipment, structures and soil and any remaining hazardous waste residues from short-term storage areas including containment system components (e.g., pads, liners, etc.), contaminated soils and subsoils, bases, and structures and equipment contaminated with waste.

3. If the generator demonstrates that any contaminated soils and wastes cannot be practicably removed or decontaminated as required in **subsection (A)(ii) of this section**, then the short-term storage area is considered to be a landfill and the

generator must close the area and perform post-closure care in accordance with the closure and post-closure care requirements that apply to landfills (**40 CFR § 265.310**). In addition, for the purposes of closure, post-closure, and financial responsibility, such an area is then considered to be a landfill, and the generator must meet all of the requirements for landfills specified in **subchapter 5 of these regulations** and **subparts G and H of 40 CFR part 265**.

Notification of Partial of Final Closure

In accordance with 40 CFR 264.112(d) and VHWMR 7-504(e), UVM will notify the Waste Management Division Director in writing at least 60 days prior to the date on which partial or final closure activities are expected to begin.

Maximum Inventory

[40CFR§264.112(b)(2) & (3)]
All waste stored at the ESF will be stored in drums or other suitable containers. The following is a listing of a hypothetical maximum inventory for each room:

Room 110	20x55 gallon drums	Poisons/Flammables/non-hazardous
Room 111	20x55 gallon drums	Poisons/Flammables/non-hazardous
Room 112	20x55 gallon drums	Flammables/corrosives
Room 113	20x55 gallon drums	Poisons
Room 116	20x55 gallon drums	Other regulated material/organic acids
Room 117	20x55 gallon drums	Inorganic acids/oxidizers
Room 118	20x55 gallon drums	Inorganic acids/oxidizers
Room 119	20x55 gallon drums	Caustics/mercury 10x55 gallon drums
Room 120	20x55 gallon drums	Ballasts/fluorescent lights
Reactives Storage Building	8x55 gallon drums	Reactive wastes

UVM, or a hired hazardous material cleanup company, will package and remove all hazardous waste from the ESF for disposal within 90 days of receipt, at the ESF, of the final volumes of hazardous waste [40CFR§264.114]. All hazardous waste will be removed from the ESF and transported to permitted TSD facilities. All hazardous wastes transported from the ESF will be packaged in accordance with DOT regulations as set forth in 49 CFR §172 and §173. All hazardous waste, shipped from the ESF, will be transported by Vermont permitted, hazardous waste haulers in vehicles permitted for hazardous waste hauling.

Closure of Equipment, Containers

Decontamination of Facility [40CFR§264.112(b)(4) and 40CFR§264.114]
After all hazardous wastes are removed from the ESF, UVM will begin activities to decontaminate or dispose of equipment and structures. UVM may contract a hazardous material cleanup company to perform these closure activities; a hazardous waste management and

cleanup company (Environmental Products and Services of Vermont) was consulted to develop the scope of closure activities and determine the estimate of costs for the closure. These activities will be complete within 180 days of receipt of the final volumes of hazardous waste at the ESF, unless an extension is requested from and granted by the Regional Administrator.

All walls, air ducts, ceilings, and floors of the waste storage rooms, the waste handling room and the hallway will be cleaned by hand scraping and or scrubbing followed by the use of a HEPA vacuum. All containment sump areas will be visually inspected for cracks and sealed prior to wet cleaning. The surfaces will then be steam cleaned using a steam generator, pressure washer and detergent. Additional cleaning will be performed where necessary. Additional cleaning solutions may be used if necessary; the specific solution will vary with the contaminant and the area being cleaned; these will need to be identified at the time of closure activities. The surfaces will be triple rinsed with clear water; the rinseate will be collected and sampled for hazardous waste determination by UVM or its contractor. Cleaning procedures will be repeated until the rinseate is determined to be non-hazardous.

The Reactives Storage Building will be cleaned by hand scraping followed by the use of a HEPA vacuum. The containment sump area will be visually inspected for cracks and sealed prior to wet cleaning. The surfaces will then be steam cleaned using a steam generator, pressure washer and detergent. Additional cleaning will be performed where necessary. Additional cleaning solutions may be used if necessary; the specific solution will vary with the contaminant and the area being cleaned; these will need to be identified at the time of closure activities. The surfaces will be triple rinsed with clear water; the rinseate will be collected for hazardous waste determination by UVM or its contractor. Rinse waters may be commingled if the contaminants are shown to be compatible. UVM or its contractor will collect samples from the final rinse water for hazardous waste determination. Cleaning procedures will be repeated until the rinseate is determined to be non-hazardous.

The truck bay and containment sump will only require pressuring washing because any spill that affects this area will have been cleaned immediately after the spill occurred. If any noticeable contaminants are discovered through rinseate analysis, the area will be decontaminated using the same protocol as the waste storage rooms.

Rinseate sampling parameters will vary depending upon the storage area. Composite samples will be taken from rooms storing similar types of wastes. Decontamination efforts will continue until contamination levels are at or below the most stringent, accepted, risk-based criteria in effect at the time of closure.

A hazardous waste cleanup contractor estimated that seven 55-gallon drums be generated during the decontamination process. UVM has increased that estimate to nineteen (19), 55-gallon drums from the following areas:

- One drum from each of rooms 110, 111, 112 and 113 which are used primarily for organic waste storage,
- One drum from each of rooms 116, 117, 118, 119 and 120 which are used primarily for inorganic waste storage,
- Two drums from the waste handing room,

- Two drums from the hallway, and
- One drum from the Reactives Storage Building
- Five drums from final rinse water.

These decontamination wastes will be treated and disposed of according to the Best Demonstrated Available Technology (BDAT) at the time of closure; these technologies can only be identified at the time of closure.

Any releases to the retention pond and associated drainage ditch during the life of the ESF will have been cleaned up immediately following the release. Therefore, there are no anticipated closure costs associated with the retention pond and the drainage ditch.

Decontamination Sampling and Analysis Quality Assurance
To ensure that decontamination efforts have been thoroughly and effectively completed, UVM or its hired contractor will sample and analyze the decontamination areas and residues. Materials will be examined to monitor the efficacy of the decontamination procedure and include DI rinses, area scrapings, decontamination tools, and affected areas.

Sampling and analysis of these materials will be performed in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publications SW-846. Test methods with the most applicable protocol edition and/or method will be used.

Appropriate sampling procedures will be implemented as dictated by the sample media type. Analytical procedures best suited to evaluate the hazards and contaminants associated with specific waste classifications will be selected. Test methods will use the most applicable protocol edition and/or method at the time.

Decontamination procedures and subsequent analyses will continue until residues of contaminants are at levels that are at or below the most stringent, accepted, risk-based criteria in effect at the time of closure. This will be evaluated by UVM, or the engineer hired to certify closure activities.

Environmental Sampling [40CFR§264.112(b)(5)]
It is not anticipated that there will be any releases of hazardous waste to the area outside of the ESF.

If a release does occur however, or if contamination outside of the ESF is suspected, UVM will conduct an environmental monitoring program in consultation with a hydrogeology firm and revise the closure cost estimate accordingly. UVM has installed 6 pairs of monitoring wells surrounding the ESF. If determined to be necessary, samples will be taken from these wells and analyzed to determine if contamination from the ESF is present. In addition, soils samples will be taken in the area surrounding the ESF and from the retention pond, as needed. The consulting geologist will determine the proper number of sampling points and will determine if there is any environmental contamination.

Closure Schedule

Proposed Closure Date
The proposed final closure date for the ESF and the Reactives Storage Building is January 1, 2042. This is based on the design life of the building and mechanical systems without major renovation (see Attachment K-5 "Structural Assessment Letter"). UVM reserves the right to change the closure date based on future renovations and needs.

Closure Schedule for UVM's One (1) Hazardous Waste Management Unit
(40CFR§264.112 & §264.113)

- January 1, 2041 – Notify the Secretary of Natural Resources and the EPA Regional Administrator
- July 5, 2041 – Last shipment of hazardous waste received at the ESF.
- September 3, 2041 – Demonstrate requirements of 40 CFR 264.113 if requesting an extension to waste removal deadline.
- October 3, 2041 – Complete removal of all wastes for final disposal
- October 31, 2041 – Initial decontamination of the ESF complete & samples submitted for analysis.
- November 7, 2041 – Determination made as to need for further decontamination.
- November 21, 2041 – Subsequent decontamination of the ESF complete (if necessary) and samples submitted for analysis.
- November 30, 2041 – Determination made as to need for further decontamination.
- December 2, 2041 – Demonstrate requirements of 40 CFR 264.113 if requesting an extension to final closure activities deadline.
- December 15, 2041 – All clean up materials decontaminated and removed from site or removed for final disposal.
- January 1, 2042 – Final closure activities are complete.
- March 1, 2042 – Certification of closure completed by a Vermont licensed, independent, professional engineer.

Extension for Closure

If the activities required to remove all hazardous wastes from the ESF will, of necessity, take longer than 90 days to complete; or if the ESF has the capacity to receive additional hazardous wastes, and there is a reasonable likelihood that UVM or another person will recommence operation of the hazardous waste management unit or the ESF within one year; and closure of the hazardous waste management unit or ESF would be incompatible with continued operation of the site; and UVM has taken and will continue to take all steps to prevent threats to human health and the environment, including compliance with all applicable permit requirement then UVM will request of the Regional Administrator, an extension to the waste removal deadline. Such request and demonstration of compliance with 40 CFR§264.113 will be made at least 30 days prior to the deadline.

If the activities required to complete final closure of the ESF will, of necessity, take longer than 180 days to complete; or if the ESF has the capacity to receive additional hazardous wastes, and there is a reasonable likelihood that UVM or another person will recommence operation of the hazardous waste management unit or the ESF within one year; and closure of the hazardous

waste management unit or ESF would be incompatible with continued operation of the site; and UVM has taken and will continue to take all steps to prevent threats to human health and the environment, including compliance with all applicable permit requirement then UVM will request of the Regional Administrator, an extension to the final closure deadline. Such request and demonstration of compliance with 40 CFR§264.113 will be made at least 30 days prior to the deadline.

Certification

[40CFR§264.115]
The ESF will be certified closed by a Vermont licensed, independent Professional Engineer (P.E.) on or before March 1, 2042. The engineer will review disposal records, decontamination procedures and laboratory analysis, visually inspect the site and conduct any interviews necessary to certify the closure of the site. The engineer will summarize these reviews in a closure report; a copy of the engineer's report will be forwarded to the Secretary and Regional Administrator. The Certification of Facility Closure at the ESF will be signed by the owner or operator of the facility and the P.E.

The ESF has no landfill cells or hazardous waste disposal units at this site. Therefore, the survey plat specified in 40CFR§264.116 is not required.

Future Use [40CFR§264.117]
Once the ESF has been certified closed, UVM reserves the right to utilize this space for other efforts in conjunction with its overall mission.

Closure Cost

[40CFR§264.142]
A detailed, written estimate, in current dollars, of the cost of closing the ESF is included in the spreadsheet in attachment K-1. This estimate assumes that:

- The ESF is operating at its maximum extent and manner;
- No UVM personnel are assisting with the closure and all costs are based on hiring a third-party contractor; and
- No value is realized from the salvage of materials from the ESF or from hazardous waste that may have economic value.

This cost estimate will be updated as required by Permit Conditions 9.2 and 9.3.

Financial Guarantee for Liability and Closure

Financial Assurance for Closure

UVM has established financial assurance for the closure of the ESF, satisfying the requirements of §264.143, and demonstrates this with a surety bond guaranteeing performance of closure as specified in 40 CFR§264.143(c). UVM demonstrates that it meets these criteria by submitting a copy of the executed bond and standby trust worded as specified in §264.151(c) and §264.151(a)(1), respectively.

The closure costs are described on the closure cost worksheet, included as attachment K-1. The closure cost is updated for inflation annually as required by Permit Condition 9.3. Updated closure costs are kept in the ESF's operating record.

Financial Assurance for Liability Coverage

UVM establishes financial assurances for coverage of sudden accidental occurrences at the ESF, satisfying the requirements of §264.147(a), and demonstrates this coverage as specified in §264.147 (a)(1) by evidence of a Certificate of Liability Insurance. UVM demonstrates that it meets these criteria by submitting a certificate worded as specified in §264.151(i).

UVM assures liability coverage for sudden accidental occurrences in the amount of $10 million per occurrence with an annual aggregate of $20 million, exclusive of legal costs.

To demonstrate that UVM meets the financial tests described above, the UVM will submit annually the following items to the Director:

- The updated closure cost. An example closure cost is provided in Attachment K-1.
- A copy of the executed surety bond and standby closure trust fund (if different from previous year). An example of these documents is provided in Attachment K-2
- A copy of the Hazardous Waste Facility Certificate of Liability Insurance. An example of this document is provided in Attachment K-3.
- A copy of UVM's Annual Financial Report. An example report is provided in Attachment K-4.

Attachment K-1

Closure Cost Worksheet

University of Vermont & State Agricultural College
Environmental Safety Facility
Hazardous Waste Facility Permit

Attachment K-1
Closure Cost Worksheet

Disposal of Maximum Inventory of Hazardous Waste							
Room 110	Bulk poisons & flammables for incineration	20	x55	@	$175.62	=	$ 3,512.39
Room 111	Labpacked poisons & flammables for incineration and treatment	20	x55	@	$421.83	=	$ 8,436.57
Room 112	Labpacked flammables & corrosives for incineration and treatment	20	x55	@	$421.83	=	$ 8,436.57
Room 113	Labpacked poisons for incineration and treatment	20	x55	@	$421.83	=	$ 8,436.57
Room 116	Bulk acids for treatment	20	x55	@	$288.61	=	$ 5,772.17
Room 117	Labpacked oxidizers and acids for incineration and treatment	20	x55	@	$421.83	=	$ 8,436.57
Room 118	Labpacked caustics for treatment	20	x55	@	$421.83	=	$ 8,436.57
Room 119	Labpacked caustics for treatment	10	x55	@	$421.83	=	$ 4,218.29
Room 119	Labpacked mercury for retorting	10	x55	@	$1,507.27	=	$ 15,072.65
Room 120	Electronic ballasts for recycling	10	x55	@	$0.27	=	$ 2.71
Room 120	Fluorescent light bulbs for recycling	20,000	ft	@	$0.07	=	$ 1,407.90
Room 120	Fluorescent light bulbs for recycling	1,500	bulbs	@	$2.71	=	$ 4,061.25
Reactives Bld	Labpacked reactives for treatment and incineration	8	x55	@	$836.08	=	$ 6,688.61
	Transportation Fees	6	trips	@	$2,500.00		$ 15,000.00
	Labor for shipping papers and final packing	80	hrs	@	$85.00	=	$ 6,800.00
	Materials and Equipment						$ 2,000.00
	Fuel and Insurance surcharge	20%					$ 21,343.76
Total disposal cost for maximum hazardous waste inventory:							**$ 128,062.57**
	Based on contracted costs provided by active 2022 UVM vendors						
Decontamination of Facility							
Site Manager & vehicle for 180 day closure period		1040	hrs	@	$110.00		$ 114,400.00
Decontamination of waste storage rooms, includes dry clean, wet clean & PPE							$ 10,000.00
Decontamination of reactives building, includes dry clean, wet clean & PPE							$ 1,000.00
Truck bay and containment sump sampling							$ 450.00
Decontamination of containment sump							$ 1,200.00
Lab analysis (3) - composite sample wipes for PCB and mercury area							$ 2,070.00
Lab analysis	(3) - analysis of rinse water from organic storage rooms, inorganic storage rooms & reactive storage building						$ 2,100.00
Disposal of estimated 19x55 gallon drums of wash water @ $250							$ 4,750.00
Disposal of HEPA filter							$ 1,000.00
	Transportation Fees						$ 2,000.00
	Labor for packaging materials and preparing manifests & paperwork	10	hrs	@	$85.00	=	$ 850.00
	Materials and Equipment						$ 2,000.00
Total for facility decontamination:							**$ 141,820.00**
	Based on cost estimate provided by Environmental Products & Services of Vermont						
Environmental Monitoring Contingency (soils, moat, monitoring wells, etc)							**$ 19,000.00**
	Based on 1989 screening for environmental contaminants at facility's proposed site.						
Closure Certification & Report by Registered Professional Engineer		20	hrs	@	$100.00		**$ 2,000.00**
	Based on cost estimate provided by ESPC Engineering and Environmental Services						
	Subtotal						**$ 290,882.57**
	15% contingency (required by VT DEC)						**$ 43,632.39**
	Total Closure Costs based on FY2022 pricing *(*Adjusted for inflation)*						**$ 334,514.96**
** Based on annual average inflation of 8.3% (Bureau of Labor and Statistics posted 05/12/2021)*							

Attachment K-2

Executed Surety Bond and Standby Closure Trust Fund

PERFORMANCE BOND

Date Bond Executed: **June 24, 2013**
Effective Date: **July 1, 2013**

Bond Premium: **$5,000.00**
Bond Number: **K08902732**

PRINCIPAL

Legal name and business address of owner or operator: **University of Vermont State Agricultural College**
Environmental Safety Facility
667 Spear St.
Burlington, VT 05405

Type of organization: **Part B Permitted Facility owned and operated by University of Vermont**

State of Incorporation: **Vermont**

SURETY

Name and business address: **Westchester Fire Insurance Company**
436 Walnut Street
Philadelphia, PA 19106

EPA Identification Number: **VTD000636563**
Name: **The Environmental Safety Facility**
Address: **667 Spear St, Burlington VT**
Closure Amount: **$361,109**

Total penal sum of bond: **$400,000**

Surety's Bond Number: **K08902732**

Amount for Closure: **$361,109**

KNOW ALL PERSONS BY THESE PRESENTS, That we, the Principal and Surety(ies) hereto are firmly bound to the Vermont Agency of Natural Resources (hereinafter called VTANR), in the above penal sum for the payment of which we bind ourselves, our heirs, executors, administrators, successors, and assigns jointly and severally; provided that, where the Surety(ies) are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety, but if no limit of liability is indicated, the limit of liability shall be the full amount of the penal sum.

WHEREAS said Principal is required, under the Vermont Hazardous Waste Management Regulations as amended, to have a permit in order to own or operate each hazardous waste management facility identified above, and

WHEREAS said Principal is required to provide financial assurance for closure, or closure and post-closure care, as a condition of the permit;

Whereas said Principal shall establish a standby trust fund as is required when a surety bond is used to provide such financial assurance;

NOW, THEREFORE, the conditions of this obligation are such that if the Principal shall faithfully perform closure, whenever required to do so, of each facility for which this bond guarantees closure, in accordance with the closure plan and other requirements of the permit as such plan and permit may be amended, pursuant to all applicable laws, statutes, rules, and regulations, as such laws, statutes, rules, and regulations may be amended,

AND, if the Principal shall faithfully perform post-closure care of each facility for which this bond guarantees post-closure care, in accordance with the post-closure plan and other requirements of the permit, as such plan and permit may be amended, pursuant to all applicable laws, statutes, rules, and regulations, as such laws, statutes, rules, and regulations may be amended,

OR, if the Principal shall provide alternate financial assurance as specified in 40 CFR part 264 subpart H, and obtain the written approval of such assurance from the Secretary of the Agency of Natural Resources (hereinafter called Secretary)), within 90 days after the date notice of cancellation is received by both the Principal and the Secretary from the Surety(ies), then this obligation shall be null and void, otherwise it is to remain in full force and effect.

The Surety (ies) shall become liable on this bond obligation only when the Principal has failed to fulfill the conditions described above.

Upon notification by the Secretary that the principal has been found in violation of the closure requirements of40 CFR part 264 subpart G, for a facility for which this bond guarantees performance of closure, the Surety (ies) shall either perform closure in accordance with the closure plan and other permit requirements or forfeit the closure amount guaranteed for the facility to the Department as directed by the Secretary.

Upon notification by the Secretary that the Principal has been found in violation of the post-closure requirements of 40 CFR part 264 for a facility for which this bond guarantees performance of post-closure care, the Surety (ies) shall either perform post-closure care in accordance with the post-closure plan and other permit requirements or forfeit the post-closure amount guaranteed for the facility to the VTANR as directed by the Secretary.

Upon notification by the Secretary that the Principal has failed to provide alternate financial assurance as specified in 40 CFR part 264 subpart H and obtain written approval of such assurance from the Secretary during the 90 days following receipt by both the Principal and the Secretary of a notice of cancellation of this bond, the Surety(ies) shall forfeit funds in the amount guaranteed for the facility(ies) to the standby trust fund as directed by the Secretary.

The Surety(ies) hereby waive(s) notification of amendments to closure plans, permits, applicable laws, statutes, rules, and regulations and agrees that no such amendment shall in any way alleviate its (their) obligation on this bond.

The liability of the Surety (ies) shall not be discharged by any payment or succession of payments hereunder, unless and until such payment or payments shall amount in the aggregate to the penal sum of this bond, but in no event shall the obligation of the Surety (ies) hereunder exceed the amount of said penal sum.

The Surety (ies) may cancel the bond by sending notice of cancellation by certified mail to the principal (owner or operator) and to the Secretary, provided, however, that cancellation shall not occur during the 120 days beginning on the date of receipt of the notice of cancellation by both the Principal and the Secretary, as evidenced by the return receipts.

The Principal may terminate this bond by sending written notice to the Surety(ies), provided, however, that no such notice shall become effective until the Surety(ies) receive(s) written authorization for termination of this bond by the Secretary.

IN WITNESS WHEREOF, the Principal and Surety (ies) have executed this Performance Bond and have affixed their seals on the date (s) set forth below.

The persons whose signatures appear below hereby certify that they are authorized to execute this surety bond on behalf of the Principal and Surety (ies) and that the wording of this surety bond is equivalent to the wording specified in of 40 CFR subpart H as such regulation was constituted on the date (s) this bond was executed.

Affix Corporate Seal

Principal

University of Vermont State Agricultural College

By: Claire L Bry Date 3/6/14

Name CLAIRE L. BURLINGHAM Title University Controller

State of Incorporation
Pennsylvania
Liability Limit
$400,000
Affix Corporate Seal

Surety

Westchester Fire Insurance Company

By: Kathryn W. Allen Date: 06/24/2013

Kathryn W. Allen, Attorney-In-Fact

Bond Premium $5,000.00 Per Annum

Standby Closure Trust Agreement

Trust Agreement, the "Agreement," entered into as of November 13, 2013 by and between **THE UNIVERSITY OF VERMONT AND STATE AGRICULTURAL COLLEGE**, an instrumentality of the State of Vermont and a nonprofit educational corporation, the "**Grantor**," and **WILMINGTON TRUST, NATIONAL ASSOCIATION**, a national banking association with its principal place of business in the State of Delaware, the "**Trustee.**"

WHEREAS, the United States Environmental Protection Agency, "EPA," an agency of the United States Government, has established certain regulations applicable to the Grantor, requiring that an owner or operator of a hazardous waste management facility shall provide assurance that funds will be available when needed for closure and/or post-closure care of the facility,

WHEREAS, the Grantor has elected to establish a trust to provide all or part of such financial assurance for the facilities identified herein,

WHEREAS, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this agreement, and the Trustee is willing to act as trustee,

NOW, THEREFORE, the Grantor and the Trustee agree as follows:

Section 1. Definitions. As used in this Agreement:

(a) The term "Grantor" means the owner or operator who enters into this Agreement and any successors or assigns of the Grantor.
(b) The term "Trustee" means the Trustee who enters into this Agreement and any successor Trustee.

Section 2. Identification of Facilities and Cost Estimates.
This Agreement pertains to the facilities and cost estimates identified on attached Schedule A.

Section 3. Establishment of Fund.
The Grantor and the Trustee hereby establish a trust fund, the "Fund," for the benefit of EPA. The Grantor and the Trustee intend that no third party have access to the Fund except as herein provided. The Fund is established initially as consisting of the property, which is acceptable to the Trustee, described in Schedule B attached hereto. Such property and any other property subsequently transferred to the Trustee is referred to as the Fund, together with all earnings and profits thereon, less any payments or distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by the Trustee, IN TRUST, as hereinafter provided. The Trustee shall not be responsible nor shall it undertake any responsibility for the amount or adequacy of, nor any duty to collect from the Grantor, any payments necessary to discharge any liabilities of the Grantor established by EPA.

Section 4. Payment for Closure and Post-Closure Care.
The Trustee shall make payments from the Fund as the EPA Regional Administrator shall direct, in writing, to provide for the payment of the costs of closure and/or post-closure care of the facilities covered by this Agreement. The Trustee shall reimburse the Grantor or other persons as specified by the EPA Regional Administrator from the Fund for closure and post-closure expenditures in such amounts as the EPA Regional Administrator shall direct in writing. In addition, the Trustee shall refund to the Grantor such amounts as the EPA Regional Administrator specifies in writing. Upon refund, such funds shall no longer constitute part of the Fund as defined herein.

Section 5. Payments Comprising the Fund.
Payments made to the Trustee for the Fund shall consist of cash or securities acceptable to the Trustee.

Section 6. Trustee Management.
The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund, without distinction between principal and income, in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this section. In investing, reinvesting, exchanging, selling, and managing the Fund, the Trustee shall discharge his duties with respect to the trust fund solely in the interest of the beneficiary and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims; *except that:*

(i) Securities or other obligations of the Grantor, or any other owner or operator of the facilities, or any of their affiliates as defined in the Investment Company Act of 1940, as amended, 15 U.S.C. 80a-2.(a), shall not be acquired or held, unless they are securities or other obligations of the Federal or a State government;
(ii) The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent insured by an agency of the Federal or State government; and
(iii)The Trustee is authorized to hold cash awaiting investment or distribution uninvested for a reasonable time and without liability for the payment of interest thereon.

Section 7. Commingling and Investment. The Trustee is expressly authorized in its discretion:

(a) To transfer from time to time any or all of the assets of the Fund to any common, commingled, or collective trust fund created by the Trustee in which the Fund is eligible to participate, subject to all of the provisions thereof, to be commingled with the assets of other trusts participating therein; and
(b) To purchase shares in any investment company registered under the Investment Company Act of 1940, 15 U.S.C. 80a-1 et seq., including one which may be created, managed, underwritten, or to which investment advice is rendered or the shares of which are sold by the Trustee. The Trustee may vote such shares in its discretion.

Section 8. Express Powers of Trustee.
Without in any way limiting the powers and discretions conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered:

(a) To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale. No person dealing with the Trustee shall be bound to see to the application of the purchase money or to inquire into the validity or expediency of any such sale or other disposition;
(b) To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted;
(c) To register any securities held in the Fund in its own name or in the name of a nominee and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, or to deposit or arrange for the deposit of such securities in a qualified central depositary even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee of such depositary with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the United States Government, or any agency or instrumentality thereof, with a Federal Reserve bank, but the books and records of the Trustee shall at all times show that all such securities are part of the Fund;
(d) To deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the Federal or State government; and
(e) To compromise or otherwise adjust all claims in favor of or against the Fund.

Section 9. Taxes and Expenses.
All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor, and all other proper charges and disbursements of the Trustee shall be paid from the Fund.

Section 10. Annual Valuation.
The Trustee shall annually, at least 30 days prior to the anniversary date of establishment of the Fund, furnish to the Grantor and to the appropriate EPA Regional Administrator a statement confirming the value of the Trust. Any securities in the Fund shall be valued at market value as of no more than 60 days prior to the anniversary date of establishment of the Fund. The failure of the Grantor to object in writing to the Trustee within 90 days after the statement has been furnished to the Grantor and the EPA Regional Administrator shall constitute a conclusively binding assent by the Grantor, barring the Grantor from asserting any claim or liability against the Trustee with respect to matters disclosed in the statement.

Section 11. Advice of Counsel.
The Trustee may from time to time consult with counsel, who may be counsel to the Grantor, with respect to any question arising as to the construction of this Agreement or any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting upon the advice of counsel.

Section 12. Trustee Compensation.
The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing from time to time with the Grantor.

Section 13. Successor Trustee.
The Trustee may resign or the Grantor may replace the Trustee, but such resignation or replacement shall not be effective until the Grantor has appointed a successor trustee and this successor accepts the appointment. The successor trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor trustee's acceptance of the appointment, the Trustee shall assign, transfer, and pay over to the successor trustee the funds and properties then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor trustee or for instructions. The successor trustee shall specify the date on which it assumes administration of the trust in a writing sent to the Grantor, the EPA Regional Administrator, and the present Trustee by certified mail 10 days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this Section shall be paid as provided in Section 9.

Section 14. Instructions to the Trustee.
All orders, requests, and instructions by the Grantor to the Trustee shall be in writing, signed by such persons as are designated in the attached Exhibit A or such other designees as the Grantor may designate by amendment to Exhibit A. The Trustee shall be fully protected in acting without inquiry in accordance with the Grantor's orders, requests, and instructions. All orders, requests, and instructions by the EPA Regional Administrator to the Trustee shall be in writing, signed by the EPA Regional Administrators of the Regions in which the facilities are located, or their designees, and the Trustee shall act and shall be fully protected in acting in accordance with such orders, requests, and instructions. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the Grantor or EPA hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, and instructions from the Grantor and/or EPA, except as provided for herein.

Section 15. Notice of Nonpayment.
The Trustee shall notify the Grantor and the appropriate EPA Regional Administrator, by certified mail within 10 days following the expiration of the 30-day period after the anniversary of the establishment of the Trust, if no payment is received from the Grantor during that period. After the pay-in period is completed, the Trustee shall not be required to send a notice of nonpayment.

Section 16. Amendment of Agreement.
This Agreement may be amended by an instrument in writing executed by the Grantor, the Trustee, and the appropriate EPA Regional Administrator, or by the Trustee and the appropriate EPA Regional Administrator if the Grantor ceases to exist.

Section 17. Irrevocability and Termination.
Subject to the right of the parties to amend this Agreement as provided in Section 16, this Trust shall be irrevocable and shall continue until terminated at the written agreement of the Grantor, the Trustee, and the EPA Regional Administrator, or by the Trustee and the EPA Regional Administrator, if the Grantor ceases to exist. Upon termination of the Trust, all remaining trust property, less final trust administration expenses, shall be delivered to the Grantor.

Section 18. Immunity and Indemnification.
The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this Trust, or in carrying out any directions by the Grantor or the EPA Regional Administrator issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor or from the Trust Fund, or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense.

Section 19. Choice of Law.
This Agreement shall be administered, construed, and enforced according to the laws of the State of Vermont.

Section 20. Interpretation.
As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each Section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement.

In Witness Whereof the parties have caused this Agreement to be executed by their respective officers duly authorized and their corporate seals to be hereunto affixed and attested as of the date first above written: The parties below certify that the wording of this Agreement is identical to the wording specified in 40 CFR 264.151(a)(1) as such regulations were constituted on the date first above written.

The University of Vermont and State Agricultural College

Richard H. Cate
Vice President for Finance and Treasurer

Attest:

Francine T. Bazluke
Vice President for Legal Affairs & General Counsel;
Corporate Secretary

Wilmington Trust, National Association

Duly Authorized Agent

David B. Young
Vice President

Attest:

Duly Authorized Agent

Christopher J. Slaybaugh
Vice President

STATE OF VERMONT
COUNTY OF CHITTENDEN, SS

On this 21 day of September 2015, before me personally came Richard H. Cate to me known, who, being by me duly sworn, did depose and say that he resides at 85 S. Prospect Street, Waterman 350B, Burlington, VT 05405 and that he is Vice President for Finance and Treasurer for the University of Vermont and State Agricultural College, the corporation described in and which executed the above instrument; that he knows the seal of said corporation; that the seal affixed to such instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation, and that he signed his name thereto by like order.

Alexandra Spannaus
Notary Public
Commission Expires 2/10/2019

State of Delaware

County of New Castle

On this 13th day of October 2015, before me personally came David B. Young to me known, who, being by me duly sworn, did depose and say that he resides at 3 Walnut Green Way, Newark, Delaware, 19702, that he is a Vice President of Wilmington Trust, N.A., the corporation described in and which executed the above instrument; that he knows the seal of said corporation; that the seal affixed to such instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation, and that he signed his name thereto by like order.

Signature of Notary Public: Karen Ciszkowski

Attachment K-3

Certificate of Liability Insurance

HAZARDOUS WASTE FACILITY CERTIFICATE OF LIABILITY INSURANCE

1. **Illinois Union Insurance Company**, (the "Insurer"), of **436 Walnut Street, Philadelphia, PA 19106** hereby certifies that it has issued liability insurance covering bodily injury and property damage to **University of Vermont.**, (the "insured"), of **284 East Avenue, Burlington, Vermont 05405** in connection with the insured's obligation to demonstrate financial responsibility under **40 CFR 264.147 or 265.147.**

   The coverage applies at**:**

   (a) EPA ID Number: VTD000636563

   Facility Name: University of Vermont and State Agricultural Collect, Environmental Safety Facility, BioResearch Complex

   Facility Address: 667 Spear Street in Burlington, VT

   for **SUDDEN ACCIDENTAL** occurrences

   The limits of liability are **$1,000,000** each occurrence and **$2,000,000** annual aggregate, exclusive of legal defense costs. The coverage is provided under policy number **PPL G47418112 001**, issued on **07/28/2023**. The effective date of said policy is **07/28/2023.**

2. The Insurer further certifies the following with respect to the insurance described in Paragraph 1:

   a. Bankruptcy or insolvency of the insured shall not relieve the Insurer of its obligations under the policy.

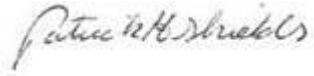
   b. The Insurer is liable for the payment of amounts within any deductible applicable to the policy, with a right of reimbursement by the insured for any such payment made by the Insurer. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated as specified in **40 CFR 264.147(f)**.

   c. Whenever requested by the director of the Ohio Environmental Protection Agency, the Insurer agrees to furnish to the director a signed duplicate original of the policy and all endorsements.

   d. Cancellation of the insurance, whether by the Insurer, the insured, a parent corporation providing insurance coverage for its subsidiary, or by a firm having an insurable interest in and obtaining liability insurance on behalf of the owner or operator of the hazardous waste management facility, will be effective only upon written notice and only after the expiration of sixty (60) days after a copy of such written notice is received by the director.

   e. Any other termination of the insurance will be effective only upon written notice and only after the expiration of thirty (30) days after a copy of such written notice is received by the director.

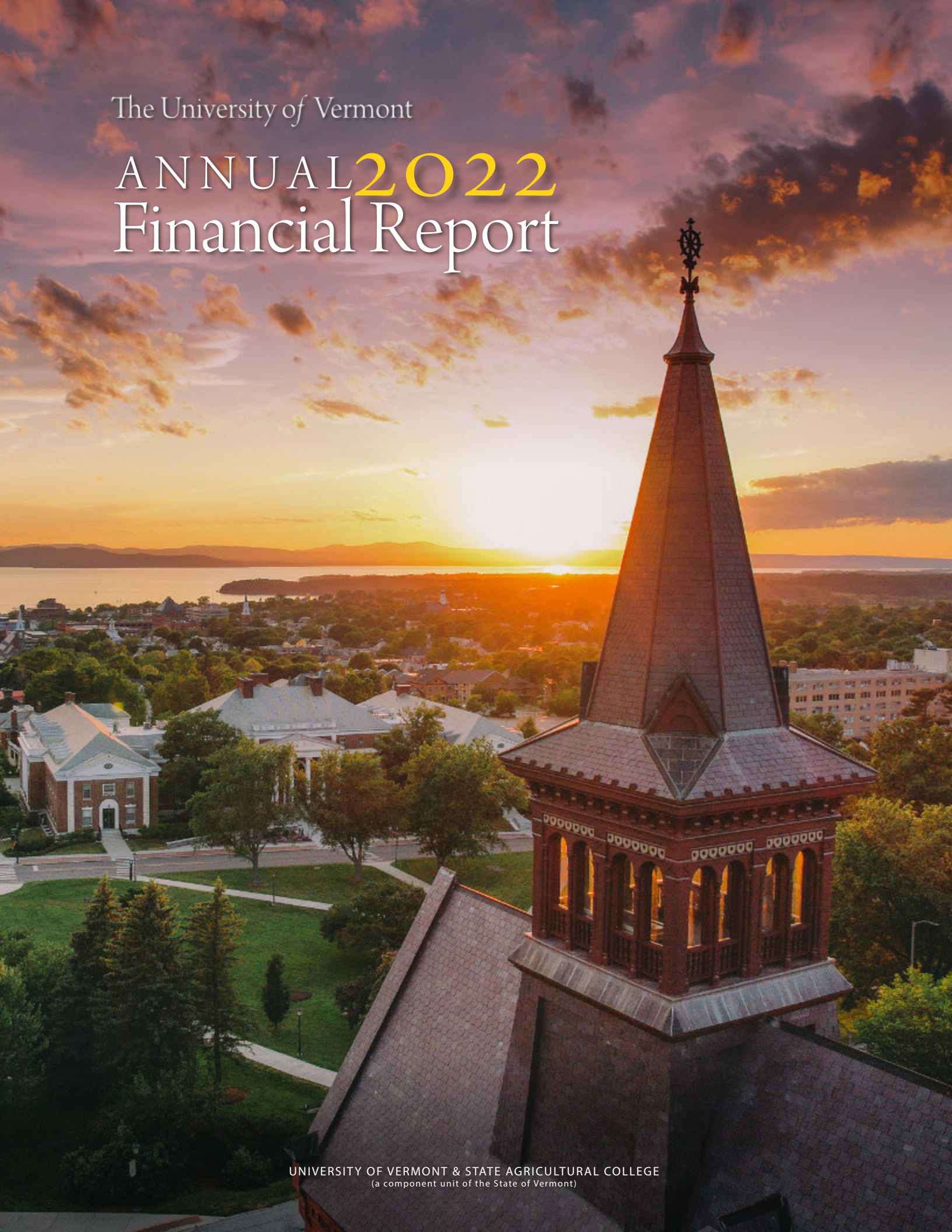
I hereby certify that the wording of this instrument is identical to the wording specified in **40 CFR 264.151(j)** as such regulation was constituted on the date first above written, and that the Insurer is licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more States.



Patrick H. Shields
Mid-Atlantic Regional Underwriting Manager, Chubb Environmental
Authorized Representative of Illinois Union Insurance Company
436 Walnut Street, WA08M
Philadelphia, PA 19106

Attachment K-4

Annual Financial Report



The University of Vermont

ANNUAL 2022 Financial Report

UNIVERSITY OF VERMONT & STATE AGRICULTURAL COLLEGE
(a component unit of the State of Vermont)

Photo by Aaron Cieri

The University of Vermont

Board of Trustees

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Cynthia Barnhart, Vice Chair, South Stafford, VT (March 2026)
Johannah L. Donovan, Secretary, Burlington, VT (March 2023)

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Kristina M. Pisanelli, Washington, D.C. (March 2028)
Lucy Rogers, Waterville, VT (March 2027)
Shapleigh Smith, Jr., Morrisville, VT (March 2023)
Catherine Toll, Danville, VT (March 2027)
Samuel R. Young, West Glover, VT (March 2025)

Suresh V. Garimella, President, ex officio
Phil Scott, Governor, ex officio

Administration

Suresh V. Garimella ..... President
Patricia Prelock ..... Provost and Senior Vice President
Trenten Klingerman ..... Vice President for Legal Affairs and General Counsel
Richard H. Cate ..... Vice President for Finance and Administration, and Treasurer
Kirk Dombrowski ..... Vice President for Research
Jeff Schulman ..... Director of Athletics
T. Simeon Ananou ..... Chief Information Officer
Joel Seligman ..... Chief Communications Officer
Michael Schirling ..... Chief Safety and Compliance Officer
Jill Irvine ..... Chief Professional and Continuing Education Officer
Jay Jacobs ..... Vice Provost for Enrollment Management
Erica Caloiero ..... Vice Provost for Student Affairs
Jane Okech ..... Vice Provost for Faculty Affairs
Jennifer Dickinson ..... Vice Provost for Academic Affairs and Student Success
Amer Ahmed ..... Vice Provost for Diversity, Equity and Inclusion
Cynthia J. Forehand ..... Dean, Graduate College
Allan Strong ..... Interim Dean, The Rubenstein School of Environment and Natural Resources
Barbara Arel ..... Acting Dean, The Grossman School of Business
Richard L. Page ..... Dean, Robert Larner, M.D. College of Medicine
Linda Schadler ..... Dean, College of Engineering and Mathematical Sciences
Leslie Parise ..... Dean, College of Agriculture and Life Sciences
William Falls ..... Dean, College of Arts and Sciences
Noma Anderson ..... Dean College of Nursing and Health Sciences
Bryn Geffert ..... Dean, University Libraries
Katharine Shepherd ..... Interim Dean, College of Education and Social Services
David Jenemann ..... Dean, Honors College

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Table *of* Contents

UNIVERSITY OF VERMONT & STATE AGRICULTURAL COLLEGE
(a component unit of the State of Vermont)

Photo credit Andy Duback

Letter *from* the President

Members of the Board of Trustees,

I attach the Annual Financial Report for the fiscal year that ended June 30, 2022. The state of UVM's finances is sound.

These financial statements illustrate a modest increase of $5.3 million in the University's net position. As of June 30, 2022, the market value of the combined pooled endowment (UVM and UVM Foundation) was $761 million. It is important to note that endowment gifts and research awards are almost entirely restricted for specific purposes by the donors and the entities that award the grants.

The University remains focused on student access and affordability, quality enhancements in programs and services, capacity-building for our distinctive research strengths, engagement with the state and our communities, and resource and revenue growth. These priorities will help ensure an even more financially healthy university, which will enable greater enhancements to the student experience and further expansion of the substantial contributions UVM makes to the state, the region and the country.

Best wishes,

Suresh Garimella

The University *of* Vermont

Management's Responsibility for the Financial Report

The accompanying financial statements of the University of Vermont and State Agricultural College for the year ended June 30, 2022 are official documents prepared in accordance with U.S. Generally accepted accounting principles set forth for public colleges and universities by the Governmental Accounting Standards Board. The management of the University is responsible for the integrity and objectivity of these financial statements, which are accessible to all. The University's system of internal accounting controls is designed to ensure that the financial reports and the books of account properly reflect the transactions of the institution, in accordance with established policies and procedures as implemented by qualified personnel.

The University Trustees selected the certified public accounting firm of KPMG, LLP to conduct the annual financial audit for fiscal year 2022.

Periodically throughout the year, the Trustee Audit Committee meets with the Office of Audit Services, the Office of Compliance and Privacy Services and the external independent audit firm to review the audit plan and later the report. The Vermont State Auditor is invited to attend those meetings to offer comments and opinions. KPMG, the Office of Audit Services, and the Office of Compliance and Privacy Services have full access to the University Trustees and the State Auditor throughout the year.

Richard H. Cate
Vice President for Finance
and Administration

Claire L. Burlingham
University Controller

KPMG LLP
One Park Place
463 Mountain View Drive, Suite 400
Colchester, VT 05446-9909

Independent Auditors' Report

The Honorable Douglas Hoffer,
Auditor of Accounts, State of Vermont
and
The Board of Trustees of the University of Vermont and State Agricultural College:

Report on the Audit of the Financial Statements

Opinions

We have audited the financial statements of the business-type activities and aggregate discretely presented component units of the University of Vermont and State Agricultural College (collectively, the University), a component unit of the State of Vermont, as of and for the years ended June 30, 2022 and 2021, and the related notes to the financial statements, which collectively comprise the University's basic financial statements for the years then ended as listed in the table of contents.

In our opinion, based on our audits and the report of the other auditors, the accompanying financial statements referred to above present fairly, in all material respects, the respective financial position of the business-type activities and the aggregate discretely presented component units of the University, as of June 30, 2022 and June 30, 2021, and the respective changes in financial position and, where applicable, cash flows thereof for the years then ended in accordance with U.S. generally accepted accounting principles.

We did not audit the financial statements of the University Medical Education Associates, Inc. (UMEA), which represent 15% and 18%, respectively, of the total assets of the aggregate discretely presented component units as of June 30, 2022 and 2021, and 12% and 15%, respectively, of the total operating revenues for the years then ended. Those statements were audited by other auditors whose report has been furnished to us, and our opinions, insofar as they relate to the amounts included for UMEA, are based solely on the report of the other auditors.

Basis for Opinions

We conducted our audits in accordance with auditing standards generally accepted in the United States of America (GAAS) and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Our responsibilities under those standards are further described in the Auditors' Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of the University and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audits. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Responsibilities of Management for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with U.S. generally accepted accounting principles, and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the University's ability to continue as a going concern for twelve months beyond the financial statement date, including any currently known information that may raise substantial doubt shortly thereafter.

Auditors' Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our opinions. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with GAAS and *Government Auditing Standards* will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

In performing an audit in accordance with GAAS and *Government Auditing Standards*, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the University's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the University's ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control related matters that we identified during the audit.

Required Supplementary Information

U.S. generally accepted accounting principles require that the management's discussion and analysis and schedule of changes in the University's total OPEB liability and related ratios be presented to supplement the basic financial statements. Such information is the responsibility of management and, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with GAAS, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audits of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Information

Management is responsible for the other information included in the annual financial report. The other information comprises the letter from the President and management's responsibility for the financial report but does not include the basic financial statements and our auditors' report thereon. Our opinions on the basic financial statements do not cover the other information, and we do not express an opinion or any form of assurance thereon.

In connection with our audits of the basic financial statements, our responsibility is to read the other information and consider whether a material inconsistency exists between the other information and the basic financial statements, or the other information otherwise appears to be materially misstated. If, based on the work performed, we conclude that an uncorrected material misstatement of the other information exists, we are required to describe it in our report.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated November 7, 2022 on our consideration of the University's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the University's internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the University's internal control over financial reporting and compliance.

KPMG LLP

Colchester, Vermont
November 7, 2022

The University *of* Vermont

Management's Discussion and Analysis (Unaudited)

June 30, 2022 and 2021

Introduction

The Management's Discussion and Analysis (MD&A) provides a broad overview of the University of Vermont's financial condition as of June 30, 2022 and 2021, the results of its operations for the years then ended, significant changes from the previous years, and outlook for the future where appropriate and relevant. Management has prepared the financial statements and related footnote disclosures along with this MD&A. The MD&A should be read in conjunction with the audited financial statements and related notes.

The University of Vermont ("the University") is a public, non-profit, comprehensive research institution of higher education established in 1791 as the fifth college in New England. The University consists of seven undergraduate schools and colleges, including the Colleges of Agriculture and Life Sciences, Arts and Sciences, Education and Social Services, Engineering and Mathematical Sciences, Nursing and Health Sciences, the Grossman School of Business, and the Rubenstein School of Environment and Natural Resources. The University also includes an Honors College, the Robert Larner, M.D. College of Medicine, the Division of Continuing and Distance Education, Extension and the Graduate College. The University is the only comprehensive research university in Vermont. The University has 11,326 undergraduate students and 2,174 graduate and medical students. It is located in Burlington, Vermont with satellite instructional and research sites throughout Vermont. It is a component unit of the State of Vermont as it receives an annual appropriation from the State. For financial reporting purposes, the University's reporting entity consists of all sectors of the University and includes discretely presented financial information for University Medical Education Associates, Inc. (UMEA) and the University of Vermont and State Agricultural College Foundation, Inc. (UVMF). UMEA is a legally separate tax-exempt component unit of the University whose purpose is to support the operations, activities and objectives of the Robert Larner, M.D. College of Medicine of the University. UVMF is a legally separate tax-exempt component unit of the University whose purpose is to secure and manage private gifts for the sole benefit of the University. The MD&A discusses the University's financial statements only and not those of its component units.

The focus of the MD&A is on the University's financial information contained in the Statements of Net Position, the Statements of Revenues, Expenses and Changes in Net Position and the Statements of Cash Flows.

Strategic Direction and Economic Outlook

The President's strategic vision, *Amplifying Our Impact,* utilizes a three-pronged approach which includes ensuring student success, investing in distinctive research strengths, and fulfilling the land grant mission.

Ensuring Student Success - The University has a culture of strong faculty mentorship and staff dedicated to student growth. The connection between health and well-being and academic achievement is promoted holistically. The University will continue to build on that legacy by making the success of its students and alumni a core measure in everything it does. The University will focus on ensuring that it offers a vibrant educational experience, that it remains affordable and accessible to a broad and diverse population, and that it provides support and meaningful opportunity well beyond graduation.

Investing in Distinctive Research Strengths - UVM has built distinctive research strengths that align with the urgent—and interdependent—need to support the health of our environment and our societies. Strategic investment of available resources will accelerate and enhance these distinctive strengths, positioning the University as the preeminent institution for innovative and sustainability-focused solutions. Articulation of distinctive strengths will also grow corporate, philanthropic, foundation, and federal partnerships to enhance UVM's research portfolio, impact and recognition, and make enriching new opportunities available to faculty and students.

Fulfilling the Land Grant Mission - As one of the nation's first land grant institutions, the University's alignment with the state is fitting. The University is nationally acclaimed for helping Vermonters tackle everything from farm viability to complex environmental issues to business growth. The University supports commercialization and job creation initiatives in the state, and partnerships with large corporations enable the possibility of attracting satellite operations, jobs, and a talented workforce to the state. The University intends to create a more streamlined gateway for Vermonters to learn about and access the many resources the University offers. Efforts to set up that front door, inviting the community to engage more fully with the University, are underway.

The fiscal 2022 operating results demonstrate the success of the *Amplifying Our Impact* vision. The Financial Highlights will summarize how the University has increased student financial aid while maintaining level tuition and fees to bolster affordability and accessibility. The success of University scholars and faculty in securing external research funding is seen not only through additional revenues and research expenditures, but also in the University's increased ranking on the Higher Education Research & Development Survey by the National Science Foundation. Finally, in fulfillment of the University's land grant mission, the impact of collaborations like the one with the U.S. Department of Agriculture (USDA) Agricultural Research Service (ARS) to develop the Food Systems Research Center, will be seen throughout the University's financial results.

Chart 1: Sponsored Program Awards By Purpose

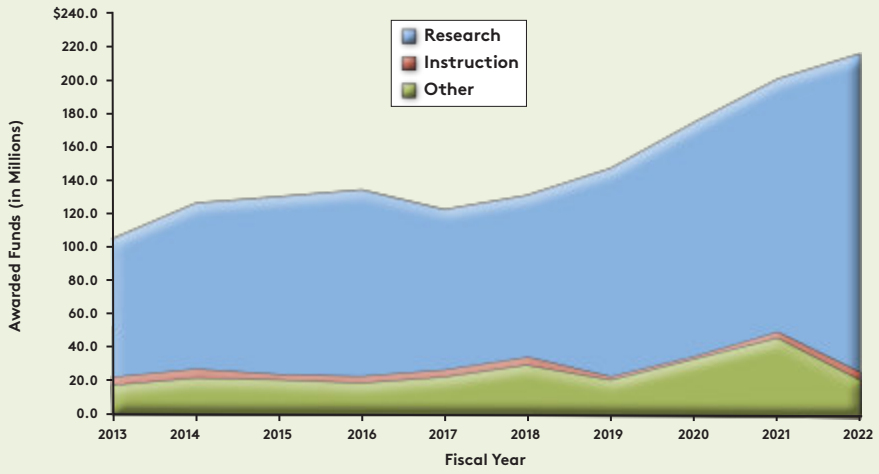


Chart 1 presents the activity of sponsored programs over the past decade.

Financial Highlights

A. Revenues

In the fall of 2022, the University enrolled 11,326 students in more than 100 undergraduate majors, 1,691 students in graduate and post-baccalaureate programs, and 483 students at the Larner College of Medicine. The University attracts undergraduates from over 40 states and many foreign countries. The University is primarily a regional institution, however, drawing 78% of the undergraduates enrolled in the fall of 2022 from New England and the Middle Atlantic States, including 16% of its undergraduate students from Vermont. Graduate and Certificate student enrollment from Vermont represented 39.9%.

Final numbers for the fall of 2022 show total applications are the highest they have been in the past decade totaling over 30,400 applications. This represents an increase of 35.9% since 2013, with in-state applications decreasing 11.4% and out-of-state applications increasing 40.9% for the same period. Total admissions increased for that period by 4.1%, with in-state admissions decreasing 18.4% and out-of-state admissions increasing 6.4%. From fall 2013 through fall 2022, total first-time, first year enrollments have also seen record highs of 3,000 enrolls, increasing by 20.2%, with in-state enrollments decreasing by 19.4% and out-of-state enrollments increasing by 32.9%. Trends in applications, admits, and enrollments can be seen in Charts 2A and 2B.

The University and its Board of Trustees continues to contain increases in tuition and fees with the average annual increases for in-state and out-of-state held to 2.7% and 2.5%, respectively, from 2014 through 2022. Table 1 presents tuition and fees, as well as room and board for that period.

Table 1: In-State and Out-of-State Tuition and Fees

	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Average Annual % Increase
Student Tuition & Fees									
In-State Tuition & Fees	$16,226	$16,768	$17,300	$17,740	$18,276	$18,802	$19,002	$19,002	2.41%
Out-of-State Tuition & Fees	$37,874	$39,160	$40,364	$41,356	$42,516	$43,690	$43,890	$43,890	2.29%
Room (Double)	$7,116	$7,376	$7,634	$7,900	$8,196	$8,502	$8,756	$8,756	3.13%
Board (Average Meal Plan)	$3,664	$3,774	$3,944	$4,122	$4,266	$4,414	$4,568	$4,568	3.18%
Total, In-State Cost	$27,006	$27,918	$28,878	$29,762	$30,738	$31,718	$32,326	$32,326	
Increase Over Previous Year	3.39%	3.38%	3.44%	3.06%	3.28%	3.19%	1.92%	0.00%	2.71%
Total, Out-of-State Cost	$48,654	$50,310	$51,942	$53,378	$54,978	$56,606	$57,214	$57,214	
Increase Over Previous Year	3.41%	3.40%	3.24%	2.76%	3.00%	2.96%	1.07%	0.00%	2.48%

Chart 2A: Trends in Vermont Applications, Admits, and Enrollments, Fall 2013 to Fall 2022

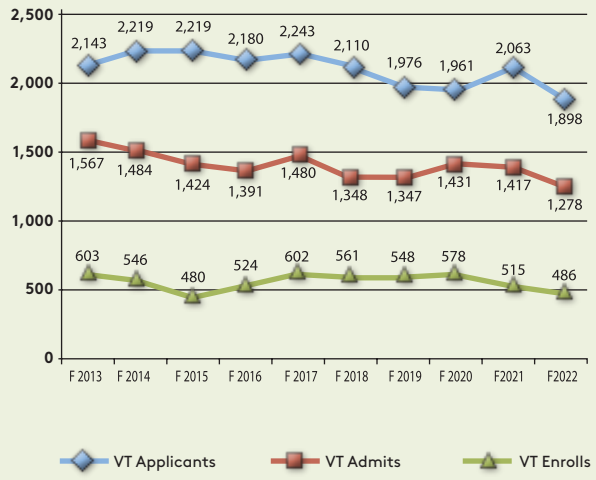
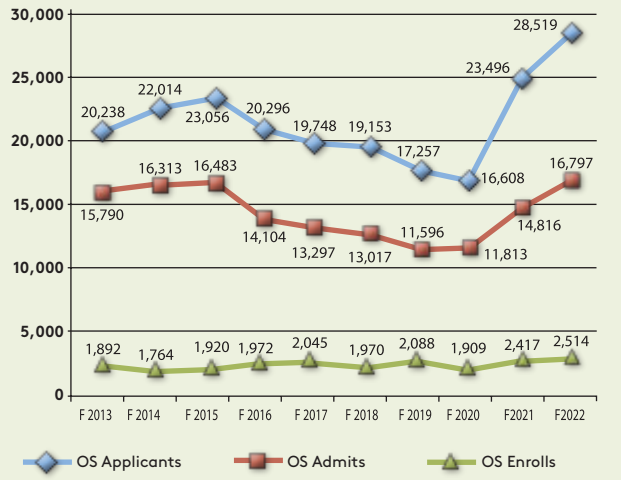


Chart 2B: Trends in Out-of-State Applications, Admits, and Enrollments, Fall 2013 to Fall 2022



During fiscal 2022, President Garimella announced that tuition for fiscal 2023 would not increase over fiscal 2022 levels. This represents the fourth consecutive fiscal year with no tuition increase. Net tuition and fees revenues improved with additional undergraduate out-of-state enrollment and higher residential life occupancy. To continue the University's effort to enhance the value of a UVM education, student financial aid was also increased.

The University has focused on enhancing other revenues including private philanthropy, improved retention of current students, increased graduate and summer enrollments, expansion of flexible and online course offerings geared to adults and non-traditional learners, enhancing graduate, post-doc and undergraduate research support through grants from the federal government and other sources and through partnerships with private industry; and supporting more students transferring to UVM from other colleges.

The University increased grant and contract revenues by $8.4 million or 3.8% from $222.6 million in fiscal 2021 to $231.0 million in fiscal 2022. This growth is due, in part, to additional one-time funds from the Higher Education Emergency Relief Funds totaling $3.2 million in fiscal 2022. Additional sponsored support for programs like the Sustainable Agriculture Research and Education (SARE) of $2.7 million and the UVM Center on Rural Addiction of $2.0 million also contributed to the increase. Included in the $231.0 million is facility and administrative cost recoveries of $36.8 million and additional commitment funds from University of Vermont Medical Center, Inc. of $15.5 million.

During fiscal 2022, the University was awarded over $214.1 million in sponsored funds, 84.7% of which were for research activities. Approximately 66% of sponsored funds awarded during fiscal 2022 were from direct federal sources. The University's leading areas of externally sponsored programs are the biomedical sciences, agriculture, the environment, and education.

State appropriations in fiscal 2022 decreased $24.3 million, or 33.4%, compared to fiscal 2021 and increased $21.0 million, or 40.6%, in fiscal 2021 compared to fiscal 2020. The increase in fiscal 2021 was entirely due to a Federal appropriation passed-through from the State of Vermont to assist the University in covering expenses related to COVID-19. These funds were not made available to the University in fiscal 2022 but the University's base State appropriation remained at the prior year's level.

B. Operating and Capital Expenditures

The University's operating expenses increased $23.4 million or 3.5% from the 2021 level; and 2021 expenses decreased $21.7 million or 3.1% over 2020. The fiscal 2022 increase is comprised of additional: compensation and benefit expense of $0.7 million; supplies and services expenses of $6.4 million; additional scholarships and fellowships of $10.0 million; and depreciation of $6.3 million. Compensation and benefit expenses increased due to scheduled wage increases. Supplies and services increased over fiscal 2021 levels primarily due to the commencement of business-related travel after COVID-19 restrictions were lifted.

The University utilized remaining federal aid dedicated to providing relief to students as the result of COVID-19 from the Higher Education Emergency Relief Funds, resulting in an increase of scholarship and fellowship expenses $10.0 million, or 33.3%, in fiscal 2022 and $2.6 million, or 9.6%, in fiscal 2021.

Finally, depreciation increased by $6.3 million due to some large construction projects being placed into service this year. During fiscal 2022, construction continued on the Athletic Complex and the Firestone Medical Research Building. This year, funding was secured to renovate the Hills Building to develop the Food Systems Research Center. The center, a collaboration between UVM and the USDA's Agricultural Research Service, will focus its work on understanding all facets of the regional food system. The total project costs are estimated at over $30 million.

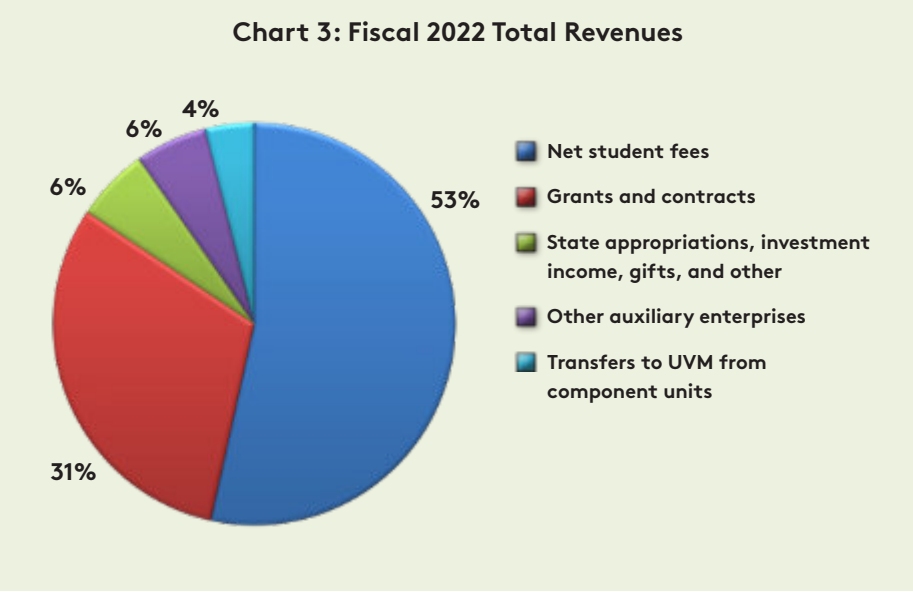


Chart 3 shows the University's fiscal 2022 revenue streams. Given the University's mission of instruction, research, and public service, the vast majority of the University's revenues are generated by net student fees (53%) and grants and contracts (31%).

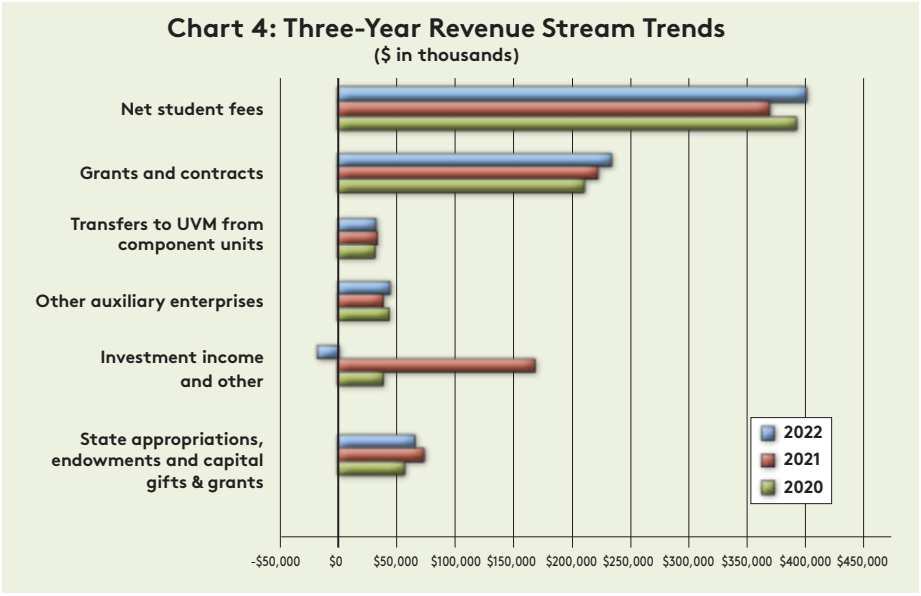


Chart 4 shows the three-year trend for revenue streams. Net student fees are comprised of tuition and fees, residential life fees, and student financial aid. State appropriations leveled in fiscal 2022 to normal levels after the State of Vermont assisted the University in covering expenses related to COVID-19 in fiscal 2021 with additional appropriations of $21.0 million. Investment income decreased $186.1 million in fiscal 2022 due to market fluctuations.

Overview of the Financial Statements

The financial statements of the University of Vermont and State Agricultural College (the "University") have been prepared in accordance with U.S. generally accepted accounting principles as prescribed by the Governmental Accounting Standards Board (GASB). The financial statement presentation consists of comparable Statements of Net Position, Statements of Revenues, Expenses, and Changes in Net Position, Statements of Cash Flows and accompanying notes for the June 30, 2022 and 2021 fiscal years. These statements provide information on the financial position of the University and the financial activity and results of its operations during the years presented. The financial statements focus on the University as a whole, rather than upon individual funds or activities.

University Medical Associates, Inc. (UMEA) and University of Vermont Foundation, Inc. (UVMF) are legally separate tax-exempt, discretely presented component units of the University of Vermont and issue separate audited financial statements. UMEA and UVMF are presented as separate columns on the University's Statements of Net Position and Statements of Revenues, Expenses and Changes in Net Position.

A. Statements of Net Position

The Statements of Net Position, Table 2, depicts all the University's assets, liabilities, and deferred inflows/outflows of resources on June 30th each year, along with the resulting net financial position. An increase in net position over time is a primary indicator of an institution's financial health. Factors contributing to future financial health as reported on the Statements of Net Position include the value and liquidity of financial and capital investments, and balances of related obligations.

As shown in Table 2, cash and short-term investments have increased over the last three fiscal years including 2.1% in fiscal 2022 and 17.0% in fiscal 2021. Included in cash and short-term investments are operating investments totaling $169.9 million, $180.9 million, and $154.7 million in fiscal 2022, 2021, and 2020, respectively. These operating investments are primarily invested in bonds but also include equity and shares of the University's long-term endowment pool.

Endowment, capital, and similar investments have decreased in fiscal 2022, by $49.1 million or 8.4%, having increased in 2021, by $106.9 million or 22.4%. Included in this balance are endowment cash, cash equivalents and investments of $461.9 million, $497.7 million, and $392.7 million in fiscal

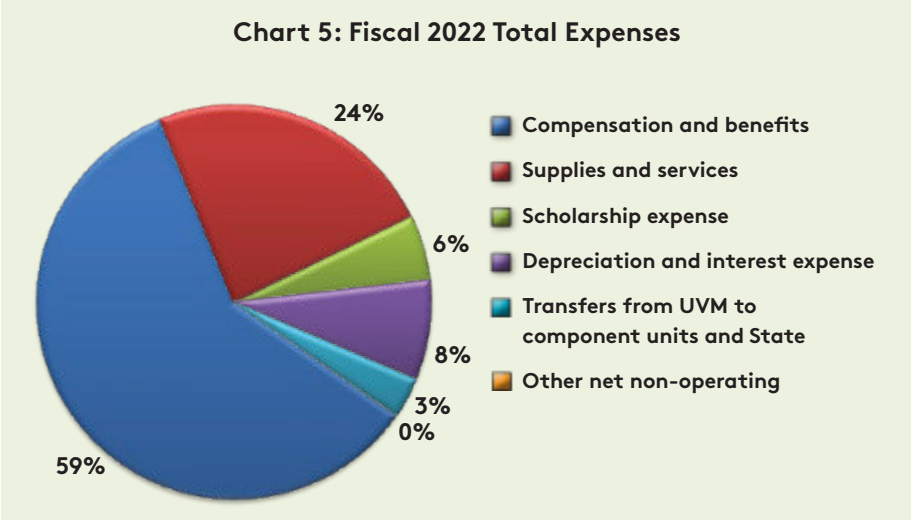


Chart 5 displays the University's fiscal 2022 expenses. The University's largest expense is compensation and benefits followed by supplies and services.

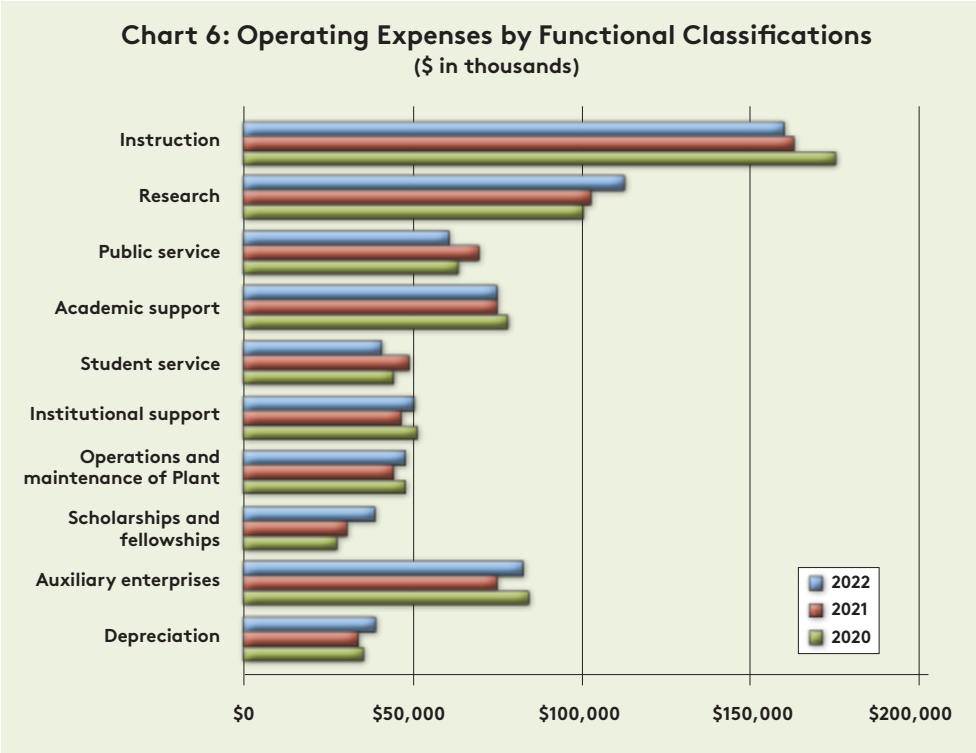


Chart 6 displays the University's operating expenses for the past three years by functional, rather than natural, classification. In fiscal 2022 the University's success in pursuit of research initiatives is evident in additional research expenditures. Scholarship and fellowships increased with the use of remaining federal aid dedicated to providing relief to students as the result of COVID-19 from the Higher Education Emergency Relief Funds.

2022, 2021, and 2020, respectively. The decrease of $35.8 million or 7.2% in fiscal 2022 and increase of $105.0 million or 26.7% in fiscal 2021 are primarily due to market performance. Deposits held by bond trustees are also included in this balance totaling $617 thousand, $11.7 million, and $27.9 million in fiscal 2022, 2021, and 2020, respectively. The balances in fiscal 2022, 2021 and 2020 are due to unspent proceeds from the issuance of general obligation bonds.

Capital and right of use assets, net, saw increases of $27.5 million or 3.9% in fiscal 2022 and $10.7 million or 1.5% in fiscal 2021. Fiscal 2022 had capital asset additions of $63.1 million. The increase to construction in progress is the primary driver where ongoing work for the Multipurpose Center, totaling $19.8 million, the Firestone Medical Research Building, totaling $21.5 million, and the Hills Building renovation, totaling $2.6 million, were added. These additions were offset by depreciation expense of $39.5 million.

Other assets and deferred outflows of resources includes accounts, loans, notes, and pledges receivable, inventories and prepaid expenses, and deferred outflows due to loss on refunding of debt and post-employment benefits. Fiscal 2022 saw a decrease from fiscal 2021 of $12.6 million or 6.8% compared to an increase in fiscal 2021 from fiscal 2020 of $29.9 million or 19.2%. The decrease in fiscal 2022 is mostly due to a decrease in post-employment benefits deferred outflows of $26.4 million stemming from changes in actuarial assumptions offset by an increase of $13.2 million in receivables.

Postemployment benefits, which represents the current and future liability and deferred inflows the University has to retirees and their dependents for medical, dental, life insurance, and tuition remission benefits, decreased $33.9 million or 5.8% in fiscal 2022 and increased $25.4 million or 4.6% in fiscal 2021. The decrease in fiscal 2022 is largely the result of assumption changes with the increase in 2021 primarily driven by a change in the discount rate to 2.12% from 2.74% from fiscal 2020.

Table 2: Condensed information from Statements of Net Position

at June 30, 2022, 2021 and 2020
($ in thousands)

	2022	2021	2020
Assets and deferred outflows of resources			
Cash and short-term investments	$ 407,744	$ 399,233	$ 341,164
Endowment, capital, and similar investments	533,868	582,986	476,118
Capital and right of use assets, net	741,588	714,084	703,342
Other assets and deferred outflows of resources	173,119	185,691	155,801
Total assets and deferred outflows of resources	**1,856,319**	**1,881,994**	**1,676,425**
Liabilities and deferred inflows of resources			
Postemployment benefits	547,457	581,323	555,882
Long-term debt	558,692	570,316	586,262
Other liabilities and deferred inflows of resources	142,496	127,939	120,548
Total liabilities and deferred inflows of resources	**1,248,645**	**1,279,578**	**1,262,692**
Net investment in capital assets	183,268	148,190	136,506
Restricted:			
Non-expendable	133,203	121,083	119,711
Expendable	397,697	438,873	336,050
Unrestricted	(106,494)	(105,730)	(178,534)
Total net position	**$ 607,674**	**$ 602,416**	**$ 413,733**

Table 2 shows condensed information from the Statements of Net Position at June 30 for the past three years.

Long-term debt decreased $11.6 million or 2.0% from fiscal 2021 due to debt service payments of $16.3 million offset by new finance and operating leases of $4.6 million. From fiscal 2020 to 2021 long-term debt decreased $15.9 million or 2.7% primarily due to a new long-term note issued to refund General Obligation Bonds, offset by scheduled debt service payments.

Other liabilities and deferred inflows of resources increased from fiscal 2021 to fiscal 2022 by 11.4% or $14.6 million from $127.9 million to $142.5 million. These balances consist of the University's accounts payable and current and non-current accrued liabilities including insurance reserves, compensated absences, obligations under deferred giving arrangements, and pledges payable. Unearned revenues, deposits and advance payments for tuition and grants & contracts are also included in this total. The decrease is primarily attributed to scheduled amortization under the service concession arrangement between the University and its food service program provider, Sodexo.

Net position is reported in four categories. The net investment in capital assets amount represents the historical cost of property and equipment reduced by total accumulated depreciation and the balance of related debt outstanding. Restricted expendable resources include balances of current and prior year gifts for specified purposes such as scholarships or academic programs, as well as spendable endowment gains. Restricted non-expendable resources are endowment balances which are required to be invested in perpetuity by the original donors. Unrestricted financial resources represent net position that is available for any future use without legal restriction and is negative due to the recording of the post-employment benefit obligation.

B. Statements of Revenues, Expenses, and Changes in Net Position

Operating revenues are generally earned through the sale of goods and services. However, GASB reporting standards require that certain University recurring revenues be shown as nonoperating. This includes state appropriations, federal Pell grants, private gifts, net investment income, and transfers from University component units. These revenue streams are important sources of funds used to supplement tuition and fees revenue. Accordingly, we have grouped the operating and nonoperating revenues together in the condensed statements to allow readers to better understand which revenues support University operating expense streams.

Net student fees increased by 8.0% from $369.8 million in fiscal 2021 to $399.5 million in fiscal 2022. Embedded in the net student fees amount are three components including gross tuition and fees, gross residential life fees, and student financial aid. Gross tuition and fees increased by $28.8 million or 6.5% from fiscal 2021 to fiscal 2022 and gross residential life fees

Table 3: Condensed information from Statements of Revenues, Expenses, and Changes in Net Position

for the years ended June 30, 2022, 2021 and 2020
($ in thousands)

	2022	2021	2020
Tuition and fees	$ 547,458	$ 503,715	$ 515,725
Less student financial aid	(147,917)	(133,889)	(124,283)
Net student fees	399,541	369,826	391,442
Grants and contracts	230,954	222,645	210,213
State appropriations	48,415	72,685	51,710
Transfers to UVM from component units	29,274	30,254	28,900
Other auxiliary enterprises	43,365	39,920	42,309
Investment income/(loss) and other	(15,403)	170,716	35,789
Total operating and non-operating revenues	**736,146**	**906,046**	**760,363**
Compensation and benefits	(440,151)	(439,434)	(464,156)
Supplies and services	(178,652)	(172,301)	(171,354)
Scholarship expense	(39,935)	(29,954)	(27,329)
Depreciation and interest expense	(60,192)	(54,725)	(54,310)
Transfers from UVM to component units and State	(24,126)	(22,144)	(22,598)
Total operating and non-operating expenses	**(743,056)**	**(718,558)**	**(739,747)**
Increase/(Decrease) in net position from recurring activities	**(6,910)**	**187,488**	**20,616**
Capital and endowment appropriations, gifts and grants	11,005	1,240	3,689
Other net non-operating revenue/(expense)	1,163	(45)	(332)
Total other changes in net position	**12,168**	**1,195**	**3,357**
Total increase in net position	**$ 5,258**	**$ 188,683**	**$ 23,973**

Table 3 shows condensed information from the Statements of Revenues, Expenses and Changes in Net Position for the past three years ended June 30.

increased $14.9 million or 25.9%. The increase in gross tuition and fees is directly attributable to additional undergraduate, out-of-state enrollments. The increase in gross residential life fees is the result of more than 20% additional occupancy over 2021. Student financial aid increased from fiscal 2021 to fiscal 2022 by $14.0 million or 10.5% demonstrating the effort to keep tuition affordable. A decrease in net student tuition and fees in fiscal 2021 of 5.5% included a 1.8% decrease in gross tuition and fees, a 6.1% decrease in gross residential life fees, and a 7.7% increase in student financial aid from fiscal 2020.

Total state appropriation revenue was $48.4 million in fiscal 2022 and $72.7 million in fiscal 2021. The decrease of $24.3 million is due to one-time funding made available to the University in fiscal 2021 to help offset the costs of COVID-19.

Transfers to UVM from component units includes transfers from the University of Vermont Foundation and University Medical Education Associates. These transfers include reimbursement of expenses on gifts received by the University of Vermont Foundation on behalf of the University. There was a decrease of $1.0 million from $30.3 million in fiscal 2021 to $29.3 million in fiscal 2022.

Other auxiliary enterprises revenues remained relatively stable at $43.4 million, $39.9 million, and $42.3 million in fiscal 2022, 2021, and 2020, respectively. The increase in revenue in fiscal 2022 of $3.5 million or 8.8% is due to improved sales at the University Bookstore.

Investment income/(loss) and other can be volatile due to the investment markets. There was a decrease of $186.1 million or 109% in fiscal 2022 from fiscal 2021. The decrease can be attributed to a net investment loss of $41.3 million in fiscal 2022 from a $148.1 million net investment income in fiscal 2021. There was an increase in the net investment income in fiscal 2021 of $138.0 million compared to fiscal 2020. In fiscal 2022, the decrease to net investment income is offset by increases in sales and services of educational activities and student loan interest and other operating revenues of $3.1 million.

Compensation and benefits increased $0.8 million or 0.2% from $439.4 million in fiscal 2021 to $440.2 million in fiscal 2022 due to scheduled wage increases offset by reduced expense related to the other post-employment benefits for fiscal 2022. The decrease of $24.8 million or 5.3% from $464.2 million in fiscal 2020 to $439.4 million in fiscal 2021 is due to cost saving measures in response to COVID-19. The University also had reduced expense related to the other post-employment benefit liability in fiscal 2021.

Supplies and services expenses increased in fiscal 2022 from fiscal 2021 by $6.4 million or 3.7% from $172.3 million to $178.7 million primarily driven by commencement of business-related travel after COVID-19 restrictions were lifted. Supplies and services expenses decreased slightly from fiscal 2020 to 2021 by $0.9 million or 0.6% due to additional costs to support in-person operations, such as COVID-19 testing, offset by one-time cost saving measures.

Scholarship expense increased $10.0 million, or 33.3%, in fiscal 2022 and $2.6 million, or 9.6%, in fiscal 2021, with the use of remaining federal aid dedicated to providing relief to students as the result of COVID-19 from the Higher Education Emergency Relief Funds.

Transfers from UVM to component units and State of $24.1 million, $22.1 million, and $22.6 million in fiscal 2022, 2021, and 2020, respectively, represents transfers to the University of Vermont Foundation to assist in its operations and contributions to the State of Vermont to support the Graduate Medical Education program.

Capital and endowment appropriations, gifts and grants represent capital gifts and grants, capital appropriations, and gifts to the University endowment. Fiscal 2022 had an increase of $9.8 million from $1.2 million in fiscal 2021 to $11.0 million primarily from new gifts for endowment purposes of $7.9 million. Fiscal 2021 had a decrease of $2.5 million from $3.7 million in fiscal 2020 to $1.2 million.

Photo by Bailey J. Beltramo

Statements of Net Position

as of June 30, 2022 and 2021

(dollars in thousands)

			Discretely Presented Component Units			
			UMEA	UMEA	UVMF	UVMF
	2022	2021	2022	2021	2022	2021
ASSETS						
Current assets:						
Cash and cash equivalents	$ 237,804	$ 218,290	$ 554	$ 237	$ 54,908	$ 47,666
Operating investments	169,940	180,943	55,961	65,832	16,167	15,159
Accounts, loans, notes, and pledges receivable, net	47,039	45,329	609	910	5,345	61,397
Inventories and prepaid expenses	16,683	17,591	11	10	567	276
Total current assets	**471,466**	**462,153**	**57,135**	**66,989**	**76,987**	**124,498**
Non-current assets:						
Endowment cash, cash equivalents and investments	461,862	497,741	-	-	234,610	167,635
Student loans, notes, and pledges receivable, net	46,034	32,785	-	-	7,914	6,254
Investments for capital activities	63,022	63,934	-	-	132	6
Deposits with trustees	8,984	21,311	-	-	1,473	1,679
Capital and right of use assets, net	741,588	714,084	-	-	7,557	7,823
Total non-current assets	**1,321,490**	**1,329,855**	**-**	**-**	251,686	**183,397**
Total Assets	**1,792,956**	**1,792,008**	**57,135**	**66,989**	**328,673**	**307,895**
DEFERRED OUTFLOWS OF RESOURCES						
Loss on refunding of debt	5,261	5,513	-	-	-	-
Postemployment benefits	58,102	84,473	-	-	-	-
Total Deferred Outflows of Resources	**63,363**	**89,986**	**-**	**-**	**-**	**-**
LIABILITIES						
Current liabilities:						
Accounts payable and accrued liabilities	91,045	87,871	315	404	10,871	6,631
Unearned revenue, deposits, and funds held for others	15,726	16,321	41,621	47,681	1,823	41
Bonds and leases payable	16,827	15,140	-	-	-	-
Total current liabilities	**123,598**	**119,332**	**41,936**	**48,085**	**12,694**	**6,672**
Non-current liabilities:						
Accrued liabilities	15,216	19,048	-	-	-	-
Postemployment benefits	436,372	474,485	-	-	-	-
Bonds and leases payable	541,865	555,176	-	-	4,443	4,665
Total non-current liabilities	**993,453**	**1,048,709**	**-**	**-**	4,443	**4,665**
Total Liabilities	**1,117,051**	**1,168,041**	**41,936**	**48,085**	**17,137**	**11,337**
DEFERRED INFLOWS OF RESOURCES						
Right of use leases and service concession arrangement	16,468	1,076	-	-	-	-
Split-interest arrangements	4,041	3,623	-	-	-	-
Postemployment benefits	111,085	106,838	-	-	-	-
Total Deferred Inflows of Resources	**131,594**	**111,537**	**-**	**-**	**-**	**-**
NET POSITION						
Net investment in capital assets	183,268	148,190	-	-	3,115	3,158
Restricted:						
Non-Expendable	133,203	121,083	-	-	218,351	190,382
Expendable	397,697	438,873	11,428	13,662	77,209	89,295
Unrestricted	(106,494)	(105,730)	3,771	5,242	12,861	13,723
Total Net Position	**$ 607,674**	**$ 602,416**	**$ 15,199**	**$ 18,904**	**$ 311,536**	**$ 296,558**

The accompanying notes are an integral part of the financial statements.

Statements of Revenues, Expenses and Changes in Net Position

for the years ended June 30, 2022 and 2021

(dollars in thousands)

			Discretely Presented Component Units			
			UMEA	UMEA	UVMF	UVMF
	2022	2021	2022	2021	2022	2021
Operating revenues						
Tuition and fees	$ 474,997	$ 446,157	$ -	$ -	$ -	$ -
Residential life	72,461	57,558	-	-	-	-
Less scholarship allowances	(147,917)	(133,889)	-	-	-	-
Net student fees	399,541	369,826	-	-	-	-
Federal, state, and private grants and contracts	223,288	215,228	-	-	1,088	885
Sales and services of educational activities	7,452	6,110	-	-	-	-
Other auxiliary enterprises	43,365	39,920	-	-	-	-
Student loan interest and other operating revenues	17,634	15,918	176	173	185	94
Total operating revenues	**691,280**	**647,002**	**176**	**173**	**1,273**	**979**
Operating expenses						
Compensation and benefits	(440,151)	(439,434)	(240)	(238)	(9,158)	(8,498)
Supplies and services	(178,652)	(172,301)	-	-	(2,834)	(1,585)
Depreciation	(39,499)	(33,174)	-	-	(350)	(338)
Scholarships and fellowships	(39,935)	(29,954)	-	-	-	-
Total operating expenses	**(698,237)**	**(674,863)**	**(240)**	**(238)**	**(12,342)**	**(10,421)**
Operating loss	**(6,957)**	**(27,861)**	**(64)**	**(65)**	**(11,069)**	**(9,442)**
Non-operating revenues/(expenses)						
State appropriations	48,415	72,685	-	-	-	-
Federal Pell grants	7,666	7,417	-	-	-	-
Private gifts	847	606	423	448	28,032	20,642
Net investment income/(loss)	(41,336)	148,082	(3,238)	6,583	(13,278)	36,633
Interest on indebtedness	(20,693)	(21,551)	-	-	(54)	(53)
Gain/(loss) on disposal of capital assets	(548)	301	-	-	-	-
Net other non-operating revenue/(expense)	1,711	(346)	-	-	(380)	(306)
Intergovernmental transfers	(13,164)	(13,682)	-	-	-	-
Transfers from UVM to component units	(10,962)	(8,462)	-	-	10,538	8,048
Transfers to UVM from component units	29,274	30,254	(826)	(7,264)	(26,328)	(18,193)
Net non-operating revenues/(expense)	**1,210**	**215,304**	**(3,641)**	**(233)**	**(1,470)**	**46,771**
Revenue/(loss) before capital and endowment additions	**(5,747)**	**187,443**	**(3,705)**	**(298)**	**(12,539)**	**37,329**
State capital appropriations	1,500	1,000	-	-		
Capital gifts and grants	1,576	192	-	-	-	-
Gifts for endowment purposes	7,929	48	-	-	27,517	72,265
Total capital and endowment additions	**11,005**	**1,240**	**-**	**-**	**27,517**	**72,265**
Increase/(decrease) in net position	5,258	188,683	(3,705)	(298)	14,978	109,594
Net position, beginning of year	602,416	413,733	18,904	19,202	296,558	186,964
Net position, end of year	**$ 607,674**	**$ 602,416**	**$ 15,199**	**$ 18,904**	**$ 311,536**	**$ 296,558**

The accompanying notes are an integral part of the financial statements.

Statements of Cash Flows

for the years ended June 30, 2022 and 2021

(dollars in thousands)

	2022	2021
Cash Flows From Operating Activities		
Tuition and fees (net of applicable scholarship allowances)	$ 345,937	$ 330,660
Grants and contracts	222,991	211,490
Sales and services of educational activities	7,452	6,110
Sales and services of auxiliary enterprises:		
Residential life fees, net of scholarship allowances	52,883	42,259
Other	43,365	39,920
Payments to employees and benefit providers	(445,085)	(443,795)
Payments to vendors	(179,019)	(163,509)
Payments for scholarships and fellowships	(39,935)	(29,954)
Other receipts, net	16,622	13,822
Net cash provided by operating activities	**25,211**	**7,003**
Cash Flows From Non-Capital Financing Activities		
State general appropriation	48,415	72,685
Federal Pell grants	7,666	7,417
Private gifts for other than capital purposes	9,741	2,123
Intergovernmental transfers	(13,164)	(13,682)
Transfers from UVM to component units	(10,962)	(7,080)
Transfers to UVM from component units	29,274	26,542
Deposits of affiliates and life income payments, net	(2,950)	17,740
Net cash provided by non-capital financing activities	**68,020**	**105,745**
Cash Flows From Capital Financing Activities		
Proceeds from issuance of capital debt	-	13,635
State capital appropriation	1,500	1,000
Capital grants, gifts and other income	3,193	192
Purchases and construction of capital assets	(64,832)	(43,134)
Proceeds from disposal of capital assets	95	84
Principal paid on capital debt	(11,732)	(29,581)
Interest paid on capital debt	(20,849)	(21,788)
Changes in deposits with trustees, net	11,096	-
Net cash used in capital financing activities	**(81,529)**	**(79,592)**
Cash Flows From Investing Activities		
Proceeds from sales and maturities of investments	237,363	236,321
Purchase of investments	(216,639)	(225,526)
Interest and dividends on investments, net	570	(266)
Net cash provided by investing activities	**21,294**	**10,529**
Net increase in cash and cash equivalents	**32,996**	**43,685**
Cash and cash equivalents - beginning of year	236,392	192,707
Cash and cash equivalents - end of year*	**$ 269,388**	**$ 236,392**
Reconciliation of Operating Loss To Cash Provided by Operating Activities		
Operating loss	$ (6,957)	$ (27,861)
Adjustments to reconcile operating loss to net cash provided by Operating Activities:		
Depreciation expense	39,499	33,174
Changes in assets and liabilities:		
Accounts receivable and loan receivable, net	641	(3,030)
Inventories and prepaid expense	909	(357)
Accounts payable	(2,307)	(50)
Unearned revenue, deposits and accrued liabilities	(6,574)	5,127
Net cash provided by operating activities	**$ 25,211**	**$ 7,003**

** of total cash and cash equivalents for 2022, $237,804 is current and $31,584 is non-current endowment and for 2021, $218,290 is current and $18,102 is non-current endowment.*

The accompanying notes are an integral part of the financial statements.

Notes to Financial Statements

For the Years Ended June 30, 2022 and 2021

(dollars in thousands)

A. Summary of Significant Accounting Policies and Presentation

The University of Vermont and State Agricultural College is a public, non-profit, comprehensive research institution of higher education with an enrollment of approximately 13,500 undergraduate, graduate, medical, and non-degree students. It is located in Burlington, Vermont with satellite instructional and research buildings throughout the State.

The University of Vermont and State Agricultural College is a land-grant institution and a component unit of the State of Vermont. The University receives an annual appropriation from the State. The Board of Trustees has 25 members including 9 legislative, 9 self-perpetuating, 3 gubernatorial, and 2 students; the Governor and President of the University serve as ex-officio members during their terms in office.

The University has received a letter from the Internal Revenue Service recognizing the University as an organization that is described in Internal Revenue Code Section 501(c)(3) and generally exempt from income taxes pursuant to Section 501(a) of the Internal Revenue Code.

1. Affiliated Organizations & Related Parties

University Medical Education Associates, Inc. (UMEA) is a legally separate component unit of the University of Vermont. UMEA is an organization described in Internal Revenue Code Section 501(c)(3) and is generally exempt from income taxes pursuant to Section 501(a) of the Code. UMEA is governed by a minimum nine-member board; five members are named as a result of their positions at the University of Vermont and the remaining are elected by the other members. UMEA's purpose is to support the operations, activities and objectives of the Robert Larner, M.D. College of Medicine of the University of Vermont. UMEA is a public non-profit organization that reports under Financial Accounting Standards Board (FASB) standards. UMEA's fiscal year ends on June 30. UMEA issues separate audited financial statements, which may be obtained by contacting the Dean's Office, Robert Larner, M.D. College of Medicine. UMEA is discretely presented on the University's Statements of Net Position and Statements of Revenues, Expenses, and Changes in Net Position.

The University of Vermont and State Agricultural College Foundation, Inc. (UVMF) was incorporated as a Vermont nonprofit corporation on March 14, 2011 and is a legally separate entity from the University of Vermont. On January 1, 2012, UVMF officially assumed all fundraising responsibilities of the Office of Development and Alumni Relations at the University. UVMF is an organization described in Internal Revenue Code Section 501(c)(3) and is generally exempt from income taxes pursuant to Section 501(a) of the Code. UVMF exists to secure and manage private gifts for the sole benefit of the University and has been recognized by the University as the primary and preferred recipient for charitable gifts to or for the benefit of the University. UVMF is governed by a board of directors composed of not less than 15 or more than 29 members, including ex officio directors. The President of the University, the Chair of the Board of Trustees of the University, the President of the UVM Alumni Association, the Chair of the UVM Medical Center Foundation, and the UVMF President/CEO are ex officio directors of UVMF. UVMF reports under FASB standards, has a fiscal year end date of June 30, and issues separate audited financial statements, which may be obtained at the UVMF's website www.uvmfoundation.org. UVMF is discretely presented on the University's Statements of Net Position and Statements of Revenues, Expenses, and Changes in Net Position. The associated assets and liabilities, including endowment cash and investments, are analogous to an internal investment pool and are not reflected within the University's Statement of Net Position as they are reflected in the discretely presented column from the UVMF.

The University has an affiliation with the University of Vermont Medical Center, Inc., University of Vermont Medical Group, Inc., and the University of Vermont Health Network, Inc. through an updated Affiliation Agreement signed in June 2014. The Affiliation Agreement is for a period of five years and has been extended an additional three years. The Agreement is to guide and govern the parties in the achievement of their common goals, including, but not limited to, providing high-quality clinical education for undergraduate and graduate students enrolled in UVM medical and health care related academic programs and health care professionals enrolled in continuing education programs. The Agreement sets forth principles and protocols designed to assist the University and the University of Vermont Medical Center (UVMMC) in coordinating efforts and allocating their resources. UVMMC agrees to pay a portion of salary, benefits, and related expenses incurred by the University to physician-faculty and staff who are also employed by UVMMC. In addition, UVMMC agrees to pay base payments that help maintain medical facilities owned and managed by the University and the Dana Medical Library. UVMMC agrees to pay a portion of the UVM Medical Group Net Patient Revenues, referred to as the Dean's Tax, to the Robert Larner, M.D. College of Medicine for purposes that promote and are consistent with the common goals of both parties.

Under the University's conflict of interest policies, all business and financial relationships, including with trustees and employees, are subject to review and approval by the Board. Disclosures about the University's related party transactions, including those affiliates, are described in this footnote to the financial statements.

2. Basis of Accounting

The accompanying financial statements have been prepared using the economic resources measurement focus and the accrual basis of accounting in accordance with U.S. generally accepted accounting principles as defined for public colleges and universities by the Governmental Accounting Standards Board (GASB).

Net position is categorized as follows:

- **Net investment in capital assets:** Capital assets, net of accumulated depreciation and outstanding principal balances of debt attributable to the acquisition, construction or improvement of those assets. Such assets include the University's physical plant.

- **Restricted:**
  Non-Expendable - Net position subject to externally imposed

(dollars in thousands)

stipulations that they be maintained permanently by the University. This category includes the corpus of the University's true endowment funds.

Expendable - Net position whose use by the University is subject to externally imposed stipulations that can be fulfilled by actions of the University to meet those stipulations or that expire through the passage of time. This category includes restricted gifts, grants, contracts and endowment appreciation.

- **Unrestricted:** Net position not subject to externally imposed stipulations. Unrestricted net position may be designated for specific purposes by action of management, the Board of Trustees or may otherwise be limited by contractual agreements with outside parties.

The University's policy for defining operating activities as reported on the Statements of Revenues, Expenses, and Changes in Net Position are those that generally result from exchange transactions such as payments received for providing services and payments made for services or goods received. Non-exchange transactions such as gifts, investment income, state appropriations and interest on indebtedness are reported as non-operating revenues and expenses.

When both restricted and unrestricted net position are available and appropriate to fund an expense, the University's practice is to allow the budget manager to determine which to use in each instance.

The preparation of financial statements in accordance with U.S. generally accepted accounting principles requires management to make estimates and assumptions that affect reported amounts and disclosures. Actual results could differ from those estimates. The most significant areas that require management estimates relate to valuation of certain investments, the valuation of the postemployment benefit obligation, allowances on accounts and loans receivable, depreciation, and certain accruals.

Effective for the fiscal year ended June 30, 2022, the University adopted GASB Statement No. 87, *Leases.* The statement supersedes GASB Statement No. 62 and establishes new requirements for calculating and reporting the University's lease activities. The adoption of Statement No. 87 has been reflected as of July 1, 2021, with right of use assets and receivables totaling $20.9 million offset with corresponding operating lease liabilities and deferred inflows of $20.9 million. There was no impact to beginning net position at July 1, 2021.

3. Fair Value Measurement

That fair value framework provides a hierarchy that prioritizes the inputs to valuation techniques used for measuring fair value. The hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 measurements) and the lowest priority to unobservable inputs (Level 3 measurements). The three levels of the fair value hierarchy are described as follows:

Level 1 – Inputs to the valuation methodology are unadjusted quoted prices for identical assets or liabilities in active or inactive markets that the University has the ability to access.

Level 2 – Inputs to valuation methodology include:

- Quoted prices for similar assets or liabilities in inactive markets;
- Quoted prices for identical or similar assets or liabilities in inactive markets;
- Inputs other than quoted prices that are observable for the asset or liability;
- Inputs that are derived principally from or corroborated by observable market data by correlation or other means.

Level 3 – Inputs to the valuation methodology are unobservable and significant to the fair value measurement. Unobservable inputs reflect the University's own assumptions about the inputs market participants would use in pricing the asset or liability (including assumption of risk). Unobservable inputs are developed based on the best information available in circumstances and may include the University's own data.

Certain investments are measured at net asset value (NAV) as a practical expedient to estimate the fair value as determined by the fund manager. Investments reported at NAV consist of shares or units in commingled funds and private partnerships as opposed to direct interests in the funds' underlying securities, which may be readily marketable and not difficult to value. NAV measured investments are not categorized in the fair value hierarchy table.

Investments in certain funds contain lock-up provisions. Under such provisions, share classes of the investment are available for redemption at various times in accordance with the management agreement of the fund.

4. Government Appropriations and Grants

Revenues associated with grants and contracts are generally recognized when related costs are incurred or when milestones are achieved. Federal, state and private grants and contracts revenue for 2022 and 2021 consists of:

Grants and Contracts	FY22	FY21
Federal appropriations, grants and contracts	$ 158,113	$ 144,631
State grants and contracts	5,908	5,970
Other governmental & private grants and contracts	59,267	64,627
TOTAL	**$ 223,288**	**$ 215,228**

State appropriations (general fund and capital) are reported as non-operating revenue. Grants awarded for capital improvements are reported as other revenues.

The University has recorded reimbursement of indirect costs relating to government contracts and grants at a predetermined rate. The reimbursement of indirect costs included in grant revenue is $36.8 million in 2022 and $34.3 million in 2021.

Federal appropriations, grants and contracts include *Higher Education*

(dollars in thousands)

Emergency Relief Fund assistance dedicated to COVID-19 relief through the duration of the pandemic of $18.8 million in 2022 and $16.4 million in 2021.

Private grants and contracts include funding of $15.5 million in 2022 and $15.9 million in 2021 to the Robert Larner, M.D. College of Medicine from the University of Vermont Medical Center, Inc. to offset facilities and operation costs.

5. Gifts

Gifts are recorded at their fair value and reported as non-operating revenue.

Promises to donate to the University are recorded as receivables and revenues when the University has met all applicable eligibility and time requirements. Since the University cannot fulfill the requirement to invest in perpetuity for gifts to endowments until the gift is received, pledges to endowments are not recognized until received.

6. Deposits and Unearned Revenue

Deposits and advance payments for the following academic year are unearned and recorded as revenues when earned. Summer session revenues are unearned to the extent that they relate to courses scheduled in July and August. Deposits and advance payments unearned revenue at June 30, 2022, and 2021, is $9,339 and $10,327, respectively.

The University records unearned revenue for cash received in excess of expenditures on grants and contracts. Grants and contracts unearned revenue at June 30, 2022, and 2021, is $4,308 and $3,934, respectively.

7. Employee Benefits

The University provides health and dental insurance to retired employees hired prior to 2012, and their families during their lives and life insurance until age 70. Employees hired on or after January 1, 2012 will continue to receive dental insurance and life insurance upon retirement. The health insurance benefit for these employees hired after January 1, 2012 has been replaced with a defined contribution Retiree Health Savings Plan (RHSP). UVM makes regular tax-free contributions to the RHSP for benefits-eligible faculty and staff. Earnings that accumulate in the RHSP grow tax free. Retirees will be able to access the savings in the RHSP to pay for eligible healthcare expenses upon retirement.

The total cost for active and retired employees for health, dental and life insurance, net of employee contributions, was $66,415 in 2022 and $68,120 in 2021. The total cost for contributions to the RHSP was $800 in 2022 and $1,102 in 2021. See note K for further information about postemployment benefits.

8. Compensated Absences

The University accrues amounts for compensated absences (principally vacation allowances) as earned. They are included in the current portion of accrued liabilities.

As of June 30, 2022, $24,266 ($23,349 in 2021) was accrued for vacation pay of which $17,903 ($17,232 in 2021) was charged to unrestricted net position and $6,363 ($6,117 in 2021) was included in deferred charges to be recovered from restricted expendable net position when paid.

9. Collections and Works of Art

The University maintains collections of inexhaustible assets, including works of art; historical artifacts; biological, geological, archaeological and ethnographic materials; and literature. While management believes the collections are quite valuable and irreplaceable, the University has not placed a dollar value on these assets. It is the University's policy to hold these assets for public exhibit, education and research rather than for financial gain and to protect, care for and maintain such assets in perpetuity. Accordingly, the collections are not capitalized for financial statement purposes.

(dollars in thousands)

B. Accounts, Loans, Notes, and Pledges Receivable

Accounts, loans, notes and pledges receivable at June 30, 2022 and 2021 are summarized as follows:

Accounts, Loans, Notes and Pledges Receivable, Net	June 30, 2022	June 30, 2021
Current		
Federal, state, and private grants receivable	$ 19,519	$ 22,120
Student and trade accounts receivable, net	9,497	10,227
Other accounts receivable	16,239	11,193
Student loans receivable, net	1,784	1,789
Total Current	**$ 47,039**	**$ 45,329**
Non-Current		
Student loans receivable, net	$ 20,159	$ 20,091
Lease receivable	14,900	-
Other notes receivable	7,141	8,312
Pledges receivable, net	3,834	4,382
Total Non-Current	**$ 46,034**	**$ 32,785**

Other accounts receivable includes the present value of expected future cash flows for lease agreements between the University and third parties, where the University serves as lessor. The current receivable balance includes $1,145 in 2022 from leases. The long-term balance from these arrangements are reported as a non-current lease receivable totaling $14,900 in 2022. The lease receivables are netted with a deferred inflow of resources totaling $15,614 in 2022.

The student accounts receivable are carried net of an allowance for doubtful accounts of $334 in 2022 and $301 in 2021.

Student loans receivable are carried net of an allowance for uncollectible UVM loans. The balances at June 30, 2022 and 2021 were $254 and $274, respectfully. The University does not record an allowance for uncollectible federal student loans since they can be assigned to the government if certain conditions stipulated by the federal government are met.

The University's liability for the federal capital contribution to the Perkins, Health Professions, Primary Care, and Nursing Student loan programs is $2,850 for 2022 and $3,530 for 2021. These amounts are included in non-current accrued liabilities.

Collections and disbursements of pass through student loans such as Federal Direct Loans, Federal Plus Loans, and Vermont Student Assistance Corporation's Green Mountain Loans are reported on a net basis in the Statements of Cash Flows.

Accounts receivable from the UVMF and UMEA are $10,281 in 2022 and $6,242 in 2021 and presented in accounts, loans, notes and pledges receivable, net on the Statements of Net Position.

C. Accounts Payable and Current Accrued Liabilities

Accounts payable and current accrued liabilities at June 30, 2022 and 2021 are summarized below:

Accounts Payable and Current Accrued Liabilities	June 30, 2022	June 30, 2021
Interest	$ 5,712	$ 5,856
Construction retainage	4,098	1,642
Compensated absences	24,266	23,349
Insurance reserves	20,047	20,621
Compensation and benefits	6,758	7,070
Other	14,182	11,043
Accounts and pledges payable	15,982	18,290
TOTAL	**$ 91,045**	**$ 87,871**

D. Capital and Right of Use Assets

Capital assets are stated at acquisition cost or, in the case of gifts, at the fair value at the date of donation.

Depreciation is calculated using the straight-line method over the estimated economic useful lives of the related assets. Certain research buildings are classified into the following components: 1) building (basic construction components/shell) with an estimated useful life of 40 years; 2) building service systems (plumbing, electrical, etc.) with an estimated useful life of 25 years; 3) interiors/renovations with an estimated useful life of 20 years and 4) fixed equipment with an estimated useful life of 15 years.

Other buildings are depreciated over a useful life of 40 years, land improvements are depreciated over a useful life of 20 years, fixed equipment is depreciated over a useful life of 15 years, and moveable equipment is depreciated over a useful life of 5 years. Software systems are depreciated over a useful life of 7 years. Major construction projects are capitalized but are not depreciated until they are put into service.

Depreciation expense for building and components including fixed equipment for fiscal year 2022 is $29,918 ($29,551 in 2021). Moveable equipment, software systems, and land improvements depreciation expense is $8,424 for 2022 ($3,623 in 2021). Right of use asset amortization expense totaled $1,157 in 2022.

Land and construction in progress are the only non-depreciable capital assets.

The University is a lessee for various non-cancellable leases of primarily land and buildings. For leases with a maximum possible term of 12 months or less at commencement, the University recognized expense based on the provisions of the lease contract. For leases greater than 12 months, the University recognizes a lease liability (footnote E) and an intangible right of use lease asset. The lease asset is initially measured as the initial amount of the lease liability, less lease payments made at or before the lease commencement date, plus any initial direct costs ancillary to placing the

(dollars in thousands)

underlying asset into service, less any lease incentives received at or before the lease commencement date. Subsequently, the lease asset is amortized into amortization expense on a straight-line basis over the shorter of the lease term or the useful life of the underlying asset. The lease liability is measured as the present value of lease payments over the lease term discounted using an incremental borrowing rate. The value of an option to terminate or extend the lease is reflected to the extent it is reasonably certain management will exercise the option. The University monitors changes in circumstances that may require remeasurement of a lease arrangement. When certain changes occur that are expected to significantly affect the amount of the lease liability, the liability is remeasured and a corresponding adjustment is made to the lease asset.

The University's net capital and right of use asset activity for the years ended June 30, 2022, and 2021 is summarized as follows:

Fiscal Year 2022	**Balance as of June 30, 2021**	**Additions**	**Retirements**	**Reclass/ Changes**	**Balance as of June 30, 2022**
Capital Assets:					
Land	$ 29,044	$ -	$ (471)	$ (7,946)	$ 20,627
Land improvements	11,738	468	-	7,946	20,152
Buildings	776,059	2,616	(257)	20,596	799,014
Building service systems	165,977	7,540	-	-	173,517
Building interiors	88,358	349	-	46	88,753
Fixed equipment	106,727	1,013	-	-	107,740
Moveable equipment	27,088	4,003	(1,303)	172	29,960
Software systems	31,891	-	-	-	31,891
Construction in progress	67,958	47,134	-	(20,814)	94,278
Total capital assets	1,304,840	63,123	(2,031)	-	1,365,932
Less: accumulated depreciation	(590,756)	(38,342)	1,388	-	(627,710)
Capital assets, net	714,084	24,781	(643)	-	738,222
Right of use assets	-	4,523	-	-	4,523
Less: accumulated amortization	-	(1,157)	-	-	(1,157)
Right of use assets, net	-	3,366	-	-	3,366
Total capital and right of use assets, net	**$ 714,084**	**$ 28,147**	**$ (643)**	**$ -**	**$ 741,588**

(dollars in thousands)

Fiscal Year 2021	Balance as of June 30, 2020	Additions	Retirements	Reclass/ Changes	Balance as of June 30, 2021
Capital Assets:					
Land	$ 29,044	$ -	$ -	$ -	$ 29,044
Land improvements	11,084	654	-	-	11,738
Buildings	768,099	4,129	(484)	4,315	776,059
Building service systems	160,978	3,508	-	1,491	165,977
Building interiors	85,731	781	-	1,846	88,358
Fixed equipment	117,582	218	(11,443)	370	106,727
Moveable equipment	39,079	1,028	(13,975)	956	27,088
Software systems	31,660	231	-	-	31,891
Construction in progress	43,417	33,519	-	(8,978)	67,958
Total capital assets	1,286,674	44,068	(25,902)	-	1,304,840
Less: accumulated depreciation	(583,332)	(33,174)	25,750	-	(590,756)
Total capital assets, net	**$ 703,342**	**$ 10,894**	**$ (152)**	**$ -**	**$ 714,084**

Key estimates and judgments include how the University determines the discount rate it uses to calculate the present value of the expected lease payments, the lease term, and the lease payments. The University generally uses its estimated incremental borrowing rate as the discount rate for leases unless the rate that the lessor charges is known. The University's incremental borrowing rate was determined from available debt instruments that carried similar dollar value and time periods to the lease portfolio.

The lease term includes the noncancellable period of the lease plus any periods covered by either a University or lessor unilateral option to extend for which it is reasonably certain to be exercised, or terminate for which it reasonably certain to be exercised. Periods in which both the University and the lessor have an option to terminate are excluded from the lease term.

(dollars in thousands)

E. Long-Term Debt

Debt obligations are generally callable by the University and bear interest at fixed rates ranging from 1.60% to 6.43%. The debt obligations mature at various dates through 2050.

Long term debt activity for the years ended June 30, 2022 and 2021 is summarized as follows:

Fiscal Year 2022

Bonds, Notes and Leases Payable	Beginning Balance	New Debt	Payments	Ending Balance Current	Ending Balance Non-Current
General obligation bonds					
Series 2010A	$ 9,000	$ -	$ -	$ -	$ 9,000
Series 2012A (1)	46,637	-	(13)	(13)	46,663
Series 2014A (2)	65,608	-	2,176	2,271	61,161
Series 2015 (3)	187,879	-	2,884	3,014	181,981
Series 2016 (4)	70,031	-	2,613	2,729	64,689
Series 2017 (5)	59,906	-	2,584	2,698	54,624
Series 2019A (6)	45,338	-	872	903	43,563
Series 2019B (7)	72,239	-	2,290	2,381	67,568
Series 2021 (note payable)	13,635	-	1,690	1,630	10,315
Finance lease liability	43	108	59	21	71
Operating lease liability	-	4,522	1,099	1,193	2,230
TOTAL	**$ 570,316**	**$ 4,630**	**$ 16,254**	**$ 16,827**	**$ 541,865**

(1) This balance shown net of bond discount of $210.
(2) This balance shown net of bond premium of $4,673.
(3) This balance shown net of bond premium of $7,560.
(4) This balance shown net of bond premium of $9,107.
(5) This balance shown net of bond premium of $8,143.
(6) This balance shown net of bond premium of $7,420.
(7) This balance shown net of bond premium of $13,534.

Fiscal Year 2021

Bonds, Notes and Leases Payable	Beginning Balance	New Debt	Payments	Ending Balance Current	Ending Balance Non-Current
General obligation bonds					
Series 2010A	$ 9,000	$ -	$ -	$ -	$ 9,000
Series 2010B	15,142	-	15,142	-	-
Series 2012A (1)	46,625	-	(12)	(13)	46,650
Series 2014A (2)	67,694	-	2,086	2,176	63,432
Series 2015 (3)	190,636	-	2,757	2,884	184,995
Series 2016 (4)	73,284	-	3,253	2,614	67,417
Series 2017 (5)	63,114	-	3,208	2,583	57,323
Series 2019A (6)	46,187	-	849	873	44,465
Series 2019B (7)	74,440	-	2,201	2,290	69,949
Series 2021 (note payable)	-	13,635	-	1,690	11,945
Finance lease liability	140	-	97	43	-
TOTAL	**$ 586,262**	**$ 13,635**	**$ 29,581**	**$ 15,140**	**$ 555,176**

(1) This balance shown net of bond discount of $223.
(2) This balance shown net of bond premium of $4,984.
(3) This balance shown net of bond premium of $7,888.
(4) This balance shown net of bond premium of $9,536.
(5) This balance shown net of bond premium of $8,526.
(6) This balance shown net of bond premium of $7,703.
(7) This balance shown net of bond premium of $14,049.

(dollars in thousands)

In compliance with the University's various bond indentures, at June 30, 2022 the University has deposits with trustees of $617 ($11,714 in 2021) for debt service reserves, sinking funds, and other requirements. Deposits with trustees are invested in obligations of the U.S. Government as required by the University's bond indentures.

The principal and interest due on bonds, notes and financing leases over the next five years and in subsequent five-year periods are presented in the table below:

For the Fiscal Year Ending June 30	Principal Due	Interest Due	Total Due
2023	$ 13,396	$ 22,497	$ 35,893
2024	14,021	21,868	35,889
2025	14,687	21,208	35,895
2026	15,382	20,514	35,896
2027	16,096	19,786	35,882
2028-2032	94,330	86,596	180,926
2033-2037	116,595	63,725	180,320
2038-2042	136,505	34,970	171,475
2043-2047	76,025	8,100	84,125
2048-2050	8,005	596	8,601
TOTAL	**$ 505,042**	**$ 299,860**	**$ 804,902**

Lease payments are evaluated by the University to determine if they should be included in the measurement of the operating lease liability. Outstanding commitments for operating leases are expected to be paid over the lease term. At June 30, 2022, the average operating lease term is approximately 10 years, with the farthest lease end date in 2027.

Variable and short-term lease payments are excluded from the measurement of the lease liability. Such amounts are recognized as lease expense in the period in which the obligation for those payments are incurred. The amounts recognized as outflows (expense) for variable and short-term lease payments not included in the measurement of the lease liabilities were $3,710 and $4,347 in 2022 and 2021, respectively.

F. Cash and Cash Equivalents and Operating Investments

The University's cash management policy provides parameters for investment of the University's pooled cash. The University classifies resources invested in money market funds and short-term investments with maturities at date of purchase of 90 days or less as cash equivalents. Operating funds invested in instruments with maturities beyond 90 days are classified as operating investments. The cash management policy establishes three pools for investment: short, intermediate and long term. Allowable investments in the short-term pool and intermediate term pool are restricted to U.S. Treasury and government agency securities, money markets, high quality corporate and asset-backed securities, and commercial and bank paper, whereas the intermediate term pool may have maturities up to six years. Investments shall be in marketable securities of the following types and with the noted credit ratings:

1. Debt securities rated Aaa, Aa, A or Baa by Moody's Investor's Service, Inc. or AAA, AA, A or BBB by Standard & Poor's Corporation.
2. Obligations of, or guaranteed by, the United States of America, its agencies or instrumentalities.
3. Obligations of, or guaranteed by, national or state banks or bank holding companies rated BB or better. No more than 20% of the funds held in the cash pool shall be invested in debt obligations of institutions within any single holding company.
4. Asset-backed securities rated Aaa by Moody's Investor's Service, Inc. or AAA by Standard & Poor's Corporation.
5. Commercial paper rated A-1 or higher by Standard and Poor's or Prime-1 (P1) by Moody's Investor's Service, Inc.
6. Bankers' acceptances or negotiable certificates of deposit issued by banks rated BB or better. No more than 20% of the funds held in the cash pool shall be invested in certificates of deposit, bankers' acceptances or floating rate notes of the institutions within any single holding company.
7. Repurchase agreements of banks having Fitch ratings no lower than BB secured by the U.S. government and federal agency obligations with market values of at least 100% of the amount of the repurchase agreement.
8. Commingled funds may be used if they are in compliance with the above guidelines.

Investment of the long-term pool shall be restricted to those that are allowable under the University's Statement of Objectives and Policies for the Endowment Fund and that meet the overall objective of achieving consistent long-term growth of the pool with limited exposure to risk.

Current and non-current cash and cash equivalents is summarized below:

Cash and Cash Equivalents	June 30, 2022	June 30, 2021
Current	$ 237,804	$ 218,290
Endowment	31,584	18,102
TOTAL	**$ 269,388**	**$ 236,392**

Current and non-current cash and cash equivalents are comprised of the following:

Cash and Cash Equivalents	June 30, 2022	June 30, 2021
Cash	$ 166,681	$ 136,052
Money Markets	102,707	100,340
TOTAL	**$ 269,388**	**$ 236,392**

(dollars in thousands)

The balance of cash held in bank deposit accounts was $166,681at June 30, 2022 and $136,052 at June 30, 2021. Of these bank balances, $647 in 2022 and $658 in 2021 were covered by the Federal Depository Insurance Corporation. The University had a third-party custodian agreement with Bank of New York Mellon, through People's United, of $72,934. The University also has an irrevocable standby letter of credit of $225,000 at June 30, 2022 and $185,000 at June 30, 2021 through the Federal Home Loan Bank of Pittsburgh as collateral for the University's primary depository account and money market account that the University has never drawn on. The University has had a revolving line of credit of $50,000 with TD Bank that has not been used. The maturity date is March 31, 2023.

Total operating investments of $169,940 at June 30, 2022 and $180,943 at June 30, 2021 were primarily made through commingled funds as described in footnote G.

G. Investments

Investments are reported in three categories in the Statements of Net Position. Investments reported as non-current assets include endowment, annuity, and life income funds. Investments for capital activities reported as non-current assets are replacement reserves designated for capital renovations. All other investments are reported as operating investments. A summary of investments is below:

Investments	June 30, 2022	June 30, 2021
Operating investments	$ 169,940	$ 180,943
Endowment investments	461,862	497,741
Investments for capital activities	63,022	63,934
TOTAL	**$ 694,824**	**$ 742,618**

Deposits with trustees include $7,229 in 2022 and $8,416 in 2021 of assets held under deferred giving arrangements, $1,138 in 2022 and $1,181 in 2021 of investments in the waste disposal fund required by the EPA, and $617 in 2022 and $11,714 in 2021 of investments held by bond trustees.

The University records its purchases and sales of investments on a trade date basis.

The assets or liabilities level within the hierarchy is based on the lowest level of input that is significant to the fair value measurement. Valuation techniques used need to maximize the use of observable inputs and minimize the use of unobservable inputs.

The determination of what constitutes observable requires judgement by the University's management. University management considers observable data to be that market data, which is readily available, regularly distributed or updated, reliable, and verifiable, not proprietary, and provided by multiple independent sources that are actively involved in the relevant market.

The categorization of an investment within the hierarchy is based upon the relative observability of the inputs to its fair value measurement and does not necessarily correspond to University management's perceived risk of that investment.

These valuations may produce a fair value that may not be indicative of net realizable value or reflective of future fair values. Furthermore, although the University believes its valuation methods are appropriate and consistent with other market participants, the use of different methodologies or assumptions to determine the fair value of certain financial instruments could result in a different fair value measurement at the reporting date.

Because of the inherent uncertainty of valuations, the estimated values as determined by the appropriate manager or general partners may differ significantly from the values that would have been used had a ready market for the investments existed, and the differences could be material.

(dollars in thousands)

Investments measured at fair value or net asset value for the years ended June 30, 2022 and 2021 are summarized as follows:

Fiscal Year 2022	**Level 1**	**Level 2**	**Level 3**	**NAV**	**Total Investments**
Investments:					
Public global equity	$ 272,042	$ -	$ -	$ 85,095	$ 357,137
Marketable alternatives	-	-	-	94,650	94,650
Private investments	-	-	-	194,874	194,874
Fixed income/debt	51,515	148,219	-	14,690	214,424
Other	550	-	690	-	1,240
Cash and cash equivalents	31,584	-	-	-	31,584
Subtotal investments	$ 355,691	$ 148,219	$ 690	$ 389,309	$ 893,909
Less UVM Foundation					$ (199,085)
Total Investments					**$ 694,824**
Deposits with Trustees at Fair Value:					
Beneficial interests in trusts	$ -	$ -	$ 3,319	$ -	$ 3,319
Public global equity	28	-	-	-	28
Fixed income/debt	348	4,356	-	-	4,704
Cash and cash equivalents	933	-	-	-	933
Total Deposits With Trustees	**$ 1,309**	**$ 4,356**	**$ 3,319**	**$ -**	**$ 8,984**

(dollars in thousands)

Fiscal Year 2021	Level 1	Level 2	Level 3	NAV	Total Investments
Investments:					
Public global equity	$ 333,505	$ -	$ -	$ 64,343	$ 397,848
Marketable alternatives	-	-	-	90,716	90,716
Private investments	-	-	-	156,258	156,258
Public real assets		-	-	2,951	2,951
Fixed income/debt	42,679	156,414	-	16,680	215,773
Other	460	-	772	-	1,232
Cash and cash equivalents	18,102	-	-	-	18,102
Subtotal investments	$ 394,746	$ 156,414	$ 772	$ 330,948	$ 882,880
Less UVM Foundation					$ (140,262)
Total Investments					**$ 742,618**
Deposits With Trustees at Fair Value:					
Beneficial interests in trusts	$ -	$ -	$ 3,733	$ -	$ 3,733
Public global equity	32	-	-	-	32
Fixed income/debt	306	5,281	-	-	5,587
Cash and cash equivalents	11,959	-	-	-	11,959
Total Deposits With Trustees	**$ 12,297**	**$ 5,281**	**$ 3,733**	**$ -**	**$ 21,311**

Investment liquidity for the years ended June 30, 2022 and 2021 is summarized as follows:

Fiscal Year 2022	Daily	Monthly	Quarterly	Semi-Annual	Annual	Illiquid	Total	Redemption Notice Period
Investments:								
Public global equity	$ 193,467	$ 143,999	$ 19,671	$ -	$ -	$ -	$ 357,137	1-90 days
Marketable alternatives	16,990	8,599	37,268	11,445	12,429	7,919	94,650	1-90 days
Private investments	-	-	-	-	-	194,874	194,874	Illiquid
Fixed income/debt	199,734	14,690	-	-	-	-	214,424	1-30 days
Other	550	-	-	-	-	690	1,240	Same day, Illiquid
Cash and cash equivalents	31,584	-	-	-	-	-	31,584	Same day
Subtotal investments	$ 442,325	$ 167,288	$ 56,939	$ 11,445	$ 12,429	$ 203,483	$ 893,909	
Less UVM Foundation							$ (199,085)	
Total Investments							**$ 694,824**	

Fiscal Year 2021	Daily	Monthly	Quarterly	Semi-Annual	Annual	Illiquid	Total	Redemption Notice Period
Investments:								
Public global equity	$ 201,415	$ 169,195	$ 27,238	$ -	$ -	$ -	$ 397,848	1-90 days
Marketable alternatives	14,109	7,342	37,799	12,360	13,306	5,800	90,716	1-90 days
Private investments	-	-	-	-	-	156,258	156,258	Illiquid
Public real assets	-	-	-	-	-	2,951	2,951	Illiquid
Fixed income/debt	199,093	16,680	-	-	-	-	215,773	1-30 days
Other	460	-	-	-	-	772	1,232	Same day, Illiquid
Cash and cash equivalents	16,311	-	1,791	-	-	-	18,102	Same day
Subtotal investments	$ 431,388	$ 193,217	$ 66,828	$ 12,360	$ 13,306	$ 165,781	$ 882,880	
Less UVM Foundation							$ (140,262)	
Total Investments							**$ 742,618**	

(dollars in thousands)

The following is a description of the investment categories:

Public Global Equity – Investments are with managers who have a geographic focus, either the U.S., Developed ex U.S. Markets, or Emerging Markets. The program provides the portfolio exposure to common equities across the globe. The University has investments in commingled vehicles, mutual funds, and separate accounts.

Marketable Alternatives – This asset class includes hedge fund managers with the intention of reducing total portfolio volatility and providing diversification. The investments are in the following categories: multi-strategy, distressed securities, global macro, open mandate, and long/short equity in global markets.

Private Investments - This asset class includes investments focusing on interests in private companies including buyout funds, secondary markets, and distressed debt as well as investments focusing on non-publicly traded interests in start-up entities.

Public Real Assets – This asset class includes investments focusing on publicly traded securities of natural resources affiliated companies and private real estate funds invested in various segments of the real estate market, including office, industrial, multi-family, and retail. The allocation also includes partnerships targeting natural resources. Many of the private real asset investments are made via lock-up funds and are thus illiquid.

Fixed Income/Debt – Investments consisting of U.S. Treasuries, corporate, and high yield bonds. The allocation is liquid and designed to protect the portfolio in deflationary periods.

Other Investments – This asset class includes insurance policies where the University is named as the beneficiary.

The fixed income/debt portfolio is composed of passive and active bond funds. The following shows the risk profiles at June 30, 2022 and 2021:

			Credit Quality %					
Fixed Income Debt	**Amount**	**Average Maturity/ Effective Duration**	**Govt/Agency**	**AAA**	**AA**	**A**	**BBB**	**<BBB**
2022	$ 214,424	2.9 /2.7	29	3	13	38	10	7
2021	$ 215,773	2.9/2.9	13	24	6	41	8	8

Investment income is recorded as revenue when earned. Net investment income is reported as non-operating revenue and includes income net of investment fees and the change in the fair value of investments as well as losses on impaired investments. The calculation of realized gains (losses) is independent of the calculation of the net increase in the fair value of marketable investments. Net investment income consists of:

Net Investment Income	**FY22**	**FY21**
Net interest, dividend, and other income	$ 858	$ 3,986
Realized gains	63,426	55,864
Unrealized gains/(losses)	(104,135)	89,842
Investment management fees	(1,485)	(1,610)
TOTAL	**$ (41,336)**	**$ 148,082**

(dollars in thousands)

H. Endowment and Other Long-Term Funds

The University's investment policies are governed and authorized by the University Board of Trustees. The Board of Trustees Investment Subcommittee has established a formal policy for investment of the endowment and other long term funds with an objective to provide a stable and consistent level of ongoing support for the University's programs through a reasoned spending policy that is also consistent with preserving and enhancing the real purchasing power of the fund over time. The primary long-term investment goal is to attain a real total return that exceeds the amount being distributed for spending and administration, currently set at 5.50%. Other important investment objectives are to achieve annualized returns in excess of the strategic policy portfolio blended benchmark, measured over a full market cycle; and to outperform the median return of a pool of endowment funds of similar size with broadly similar investment objectives and policies.

The endowment in aggregate (which comprises the consolidated endowment and other separately invested assets), long term capital and operating reserves, and UVM Foundation assets are invested in a balanced portfolio consisting of traditional equities (domestic and international) and fixed income/debt; marketable alternatives (hedge funds); private investments (venture capital and private equity); and a diversified portfolio of public real assets (real estate and commodities). The consolidated endowment's asset allocation target and actual percentages at June 30 are presented in the following tables:

Unaudited	June 30, 2022	
	Target %	Actual %
Public global equity	45.0	48.5
Marketable alternatives	10.0	11.3
Private investments	35.0	26.8
Fixed income/debt	8.0	9.1
Cash & cash equivalents	2.0	4.3

	June 30, 2021	
	Target %	Actual %
Public global equity	45.0	55.5
Marketable alternatives	10.0	10.9
Private investments	35.0	22.6
Fixed income/debt	8.0	8.4
Cash & cash equivalents	2.0	2.6

The majority of endowment fund assets are pooled for investment purposes. Each individual fund subscribes to or disposes of units on the basis of the value per unit at fair value at the beginning of the month within which the transaction takes place. Income is distributed on a per unit basis. Of the total units (each having a fair value of $69.04), 5,225.5937 units were owned by endowment funds and 5,304.5281 units by quasi endowment funds at June 30, 2022 ($76.62, 4,841.1382 and 4,354.7341 respectively, at June 30, 2021).

The University of Vermont Foundation (UVMF) participates in the UVM pooled endowment. The UVMF owned 2,883.7550 units with a market value of $199,085 as of June 30, 2022 and 1,830.7242 units with a market value of $140,262 as of June 30, 2021.

The Uniform Prudent Management of Institutional Funds Act (UPMIFA) requires the institution define an overall prudent approach both to distribution of funds for spending and long-term preservation and growth of capital. The University policy allows distributions from endowments that are temporarily underwater in accordance with the statute. The Investment Subcommittee of the Board of Trustees reviews the income distribution rate annually.

The table below summarizes changes in relationships between cost and fair values of the pooled endowment:

	Fair Value	Cost	Net Change
June 30, 2022	$ 726,964	$ 611,026	$ 115,938
June 30, 2021	704,546	477,167	227,379
Unrealized net gain/(loss)			(111,441)
New gifts and transfers			92,568
Realized net gain			62,233
Net loss			(1,727)
Withdrawn for spending			(19,215)
Total Net Change			**$ 22,418**

	Fair Value	Cost	Net Change
June 30, 2021	$ 704,546	$ 477,167	$ 227,379
June 30, 2020	538,147	425,817	112,330
Unrealized net gain/(Loss)			115,049
New gifts and transfers			14,838
Realized net gain			54,894
Net loss			(598)
Withdrawn for spending			(17,784)
Total Net Change			**$ 166,399**

I. Commitments

Major plant projects include commitments as follows:

Unaudited Project	Estimated Project Cost	Project-to-Date Expenditures 2022	Project-to-Date Expenditures 2021
Firestone Medical Research Building	$ 49,000	$ 39,605	$ 17,970
Multipurpose Center	95,000	63,050	43,065
Hills Building	32,000	2,717	

Obligations under lease agreements are detailed in note E.

(dollars in thousands)

The University is obligated under certain of its investments to make future capital contributions in the amount of $75,841 as of June 30, 2022.

The University entered into agreements with the State of Vermont Department of Vermont Health Access in both 2022 and 2021, to make payments to support the Graduate Medical Education (GME) program. The GME program helps ensure access to quality and essential professional health services for Medicaid beneficiaries through the care provided by teaching physicians and teaching hospitals. The University uses general fund state appropriation dollars to fund the GME payments through an inter-governmental transfer to the State. GME payments totaling $13,164 and $13,682 were made in 2022 and 2021, respectively, and are recorded on the Statements of Revenues, Expenses, and Changes in Net Position under Intergovernmental transfers in the Non-operating revenues and expenses section. For 2023, based on the four-year agreement entered into on June 24, 2021, the University will make quarterly payments to the State of Vermont Department of Vermont Health Access totaling $13,205.

The University is exposed to various risks of loss related to torts; theft of, damage to and destruction of assets; errors and omissions; injuries to employees; and natural disasters and business interruption. The University manages these risks through a combination of self-insurance and commercial insurance purchased in the name of the University. The University's annual self-insured obligation for general liability is $500 per occurrence and $25 per occurrence for automobile liability. Its assumption of risk for property losses is $250 per occurrence. Educator's legal liability risks are subject to a $300 per loss retention. Worker's compensation is subject to a $650 per occurrence retention. None of these lines of coverage have an annual self-insured aggregate or stop-gap. Settled claims resulting from these risks have not exceeded commercial insurance coverage in any of the past three fiscal years.

The University is a member of a Vermont captive, Pinnacle Consortium of Higher Education. The captive covers two insurance lines, general liability and automobile liability. All members are required to participate in the captive general liability program which provides $3,000 excess limit and the group purchase liability program that provides a $22,000 excess limit. The University has purchased an additional $75,000 from the commercial liability insurance market to bring the total excess limit to $100,000.

The University follows the policy of self-insuring risks up to certain limits. At year end, the University had open claims valued at $2,344 in 2022 and $3,301 in 2021; $31 and $500 of this is covered by excess insurance in 2022 and 2021, respectively. The University paid claims of $2,531 in 2022 and $2,698 in 2021. Reserves for property and casualty liabilities are included in accrued liabilities (including incurred but not reported) in the amount of $20,047 at June 30, 2022 and $20,621 at June 30, 2021.

In conducting its activities, the University from time to time is the subject of various claims and has claims against others. The ultimate resolution of such claims is not expected to have a material adverse or favorable effect on the financial position, operating performance or cash flows of the University.

Four groups of University employees are represented by collective bargaining units. The University participates in contract negotiations with these groups periodically.

The University receives significant financial assistance from federal and state agencies in the form of grants and contracts. Expenditures of funds under these programs require compliance with the grant agreements and are subject to audit. Any disallowed expenditures resulting from such audits become a liability of the University. In the opinion of management such adjustments, if any, are not expected to materially affect the financial condition, operating performance or cash flows of the University.

J. Retirement Plans

Faculty, staff and post-doctoral employees at the University of Vermont may participate in the University's 403(b) defined contribution plan and a 457(b) deferred compensation plan provided the following criteria are met:

- faculty and staff in 9-, 10-, 11-, or 12-month appointments must have a full-time equivalency of .75 or greater. These individuals may become eligible for UVM contributions;
- faculty, staff and post-doctoral employees with a 12-month appointment must have a full-time equivalency of .50 to .75 to be eligible to make contributions to UVM's 403(b) and 457(b) plans. These individuals are not eligible for UVM contributions;
- post-doctoral employees must have a full-time equivalency of .50 or greater to be eligible to make contributions to UVM's 403(b) and 457(b) plans. These individuals are not eligible for UVM contributions;
- non-represented staff, Staff United and United Electrical staff must be employed three years before they qualify for University contributions to their retirement plan, or, to waive this waiting period, they must have a vested interest in the retirement plan of their previous nonprofit employer;
- staff represented by the Teamsters Union are eligible for the 10% UVM contribution after the successful completion of their probationary period;
- non tenure-track faculty and faculty under the rank of assistant professor must wait two years to qualify for University contributions to their retirement plan, or, to waive this waiting period, they must have a vested interest in the retirement plan of their previous nonprofit employer;
- officers of administration or tenure track faculty at the level of assistant professor or above receive University contributions to their retirement plan immediately upon enrolling in the plan.

To obtain University contributions, faculty members and officers of administration must contribute 3% of their salary, and staff must contribute 2%. The University's contribution to the retirement fund of qualified faculty and staff is 10% of salary and this amount is immediately vested.

The University also offers a 457(b) deferred compensation plan. Faculty and staff can participate provided they are participating in the 403(b) plan. The University makes no contributions to this plan.

(dollars in thousands)

The University's 403(b) and 457(b) contributory retirement plans are administered by the Teachers Insurance Annuity Association of America (TIAA), the College Retirement Equities Fund (CREF), and Fidelity Investments.

Since both faculty and staff are immediately vested in all retirement contributions made on their behalf, the University has no control of, responsibility for, or ownership of retirement funds, except that employees may not withdraw employer funds contributed to either their 403(b) or 457(b) plan while employed at the University. Retirement funds may be transferred among the investment alternatives at the discretion of the employee.

Upon leaving the University, employees may remain in the UVM plan but may no longer make contributions, withdraw funds from their accounts, or transfer the funds to other investment alternatives subject to the limitations of 403(b) and/or 457(b) regulations and the contractual provisions of their investment alternative.

For the years ended June 30, 2022 and 2021, the University had total payroll expense of $314,069 and $305,129, respectively, of which $228,143 in 2022 and $228,652 in 2021 was covered by the University's 403(b) retirement plan. Total employee and employer contributions for 403(b) pension benefits for the year were $19,684 and $22,814, respectively, for 2022 and $19,496 and $22,865, respectively, for 2021. The University's contribution for 403(b) pension benefits is 10% of the covered payroll. Total employee contributions to the 457(b) retirement plan were $6,186 in fiscal year 2022 and $6,143 in fiscal year 2021.

K. Postemployment Benefits Other Than Pensions (OPEB)

The University accounts for its postemployment benefit plan in accordance with GASB Statement 75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions.* GASB Statement 75 prescribes a methodology which requires the employer to recognize a total OPEB liability on the Statements of Net Position. Changes in the total OPEB liability will immediately be recognized as OPEB expense on the Statements of Revenues, Expenses, and Changes in Net Position or reported as deferred outflows or deferred inflows of resources depending on the nature of the changes.

1. Plan Description

The University's OPEB plan covers medical, (base) dental, life insurance, and tuition remission benefits provided to eligible University retirees and their dependents. The plan was established under the authority of and may be amended by the University. It is a single employer defined benefit OPEB plan administered by the University. No assets are accumulated in a trust that meets the criteria in paragraph 4 of GASB Statement 75.

Plan provisions include two levels of eligibility based on whether the employee was at least 65 years of age at June 30, 2014:

1) Pre-65 retirees that met the retirement benefit eligibility criteria that were in place at the time of his or her hire date, and retired on or before June 30, 2014, will receive the post-retirement medical benefit and premium contributions will remain unchanged. For employees hired before January 1, 2012, if the employee met the retirement eligibility criteria that were in place at the time of his or her hire date, and did not retire on or before June 30, 2014, then he or she is eligible for the benefit but his or her share of the premium contribution will change based on the employee's salary at the date of retirement. If, by June 30, 2014, the employee has not met the eligibility criteria that were in place at the time of his or her hire date, then he or she will be eligible to enroll in the pre-65 post-retirement medical benefit plan, but will be responsible for 100% of the premium unless the employee has at least fifteen years of service in which case, at the age of 62, the employee will be eligible for the pre-retirement medical benefit and will pay 50% of the premium for Non-United Academic employees, and 60% of the premium for United Academic employees. Employees hired on or after January 1, 2012 will be able to participate in the post-retirement medical plan, but they will be responsible for 100% of the premium.

2) Post-65 retirees that met the retirement benefit eligibility criteria that were in place at the time of his or her hire date, and retired on or before June 30, 2014, will receive the post-retirement medical benefit and premium contributions will remain unchanged. Employees hired before January 1, 2012 who do not retire by June 30, 2014 will be eligible for the post-65 benefit when they reach the age of 65 and have 15 years of service, but the premium will change based on the employee's salary at the date of retirement. Employees hired on or after January 1, 2012 will be able to participate in the post-retirement medical plan, but they will be responsible for 100% of the premium.

Employees who retired under the Voluntary Separation Plan of 1992 or before are not required to contribute to the plan, however, a surviving spouse receives two (2) years of medical and base dental coverage without charge, after which dental terminates (the surviving spouse would be eligible for 36 months of COBRA) and medical coverage is available at 50% of the cost of providing coverage. Retirees under the Voluntary Separation Plan of 2000 pay for their medical benefits based on the contribution system in effect prior to June 30, 2000 (based on 0.5% times 75% of the average final three years' base salary). Retirees hired after June 30, 1992 have the same salary band contribution percentages as active employees, which is based on 75% of their average final three years' base salary. Retirees hired after June 30, 1992 and before July 1, 1997 are required to contribute as above plus a percentage based on the sum of their age at retirement and their years of continuous full-time service. This surcharge is based on a scale that ranges from 65 to 75 and over. A retirement benefit structure was announced in December 2011, affecting employees retiring on or after June 30, 2015. Consideration is given to age and years of service, with employee participation in medical benefit coverage and the costs associated with that coverage.

(dollars in thousands)

At the valuation date of January 1, 2021, the following employees were covered by the benefit terms:

Inactive employees or beneficiaries currently receiving benefits	1,848
Active employees	4,016
TOTAL	**5,864**

2. Total OPEB Liability

The University's total OPEB liability of $436,472 in 2022 and $474,485 in 2021 was determined by an actuarial valuation as of January 1, 2021, and then projected forward to the measurement date of December 31, 2021 and December 31, 2020, respectively.

The total OPEB liability as of the December 31, 2021 measurement date was determined using the following actuarial assumptions and other inputs, applied to all periods included in the measurement, unless otherwise specified:

Inflation	2.30%
Salary Increases	3.00%
Discount Rate	2.06%

The following percentages have been assumed for election of coverage by future eligible retirees:

Medical and Rx	90%
Dental	95%
Life Insurance	95%
	50% for disabled retirees

Assumed health care cost trend rates vary by benefit type as follows:

Benefit	Initial Rate	Ultimate Rate	Year Ultimate Rate is Reached
VHP Pre-Medicare	5.9%	3.7%	2074
J Carve-Out Medicare	0.0%	3.7%	2074
MediComp III Medicare	0.0%	3.7%	2074
Dental	7.9%	3.7%	2074
Tuition Remission	2.3%	2.3%	2021

The discount rate was based on Bond Buyer GO 20-Bond Municipal Bond Index. The discount rate is as of the measurement date.

The mortality rates for 2022 were based on the Pri-2012 Retiree/Employee Mortality Table projected with Projection Scale MP-2021 for healthy participants, Pri-2012 Contingent Survivor Table with Scale MP-2021 for current surviving spouses, and Pri-2012 Disabled Mortality Table projected with Projection Scale MP-2021 for disabled participants. The mortality rates for 2021 were based on the Pri-2012 Retiree/Employee Mortality Table projected with Projection Scale MP-2020 for healthy participants, Pri-2012 Contingent Survivor Table with Scale MP-2020 for current surviving spouses, and Pri-2012 Disabled Mortality Table projected with Projection Scale MP-2020 for disabled participants.

The University's OPEB plan is not large enough to develop credible mortality table based exclusively on plan experience. Therefore, the University has relied on the previously mentioned published mortality table in which credible mortality experience was analyzed.

3. Changes in Total OPEB Liability

The following table represents changes in Total OPEB Liability for the year ended June 30, 2022 and 2021:

Total OPEB Liability	Fiscal Year 2022	Fiscal Year 2021
Balance at the beginning of year	$ 474,485	$ 530,031
Changes for the year:		
Service cost	15,745	13,582
Interest on total OPEB liability	10,251	14,661
Effect of economic/demographic gains or losses	(9,093)	(117,836)
Effect of assumption changes or inputs	(41,561)	51,272
Benefit payments	(13,455)	(17,225)
Net changes	(38,113)	(55,546)
Balance at end of the year	**$ 436,372**	**$ 474,485**

The effect of assumption changes or inputs resulted in a net decrease to the OPEB liability and is comprised of several factors. Declining coverage election numbers, estimated at $27.3 million, and favorable medical and dental cost trends, estimated at $20.3 million, decreased the liability by $47.6 million. Projections in the new mortality scale, estimated at $2.4 million, and the discount rate decreasing to 2.06% in FY22 from 2.12% in FY21, estimated at $3.7 million, increased the liability by $6.1 million.

The following tables present the total OPEB liability of the University, calculated using the discount rates of 2.06% in FY22 and 2.12% in FY21, as well as what the University's total OPEB liability would be if it were calculated using a discount rate that is 1 percentage point lower or 1 percentage point higher than the current rate.

Fiscal Year 2022	1% Decrease (1.06%)	Discount Rate (2.06%)	1% Increase (3.06%)
Total OPEB liability	$ 506,193	$ 436,372	$ 379,904
Fiscal Year 2021	**1% Decrease (1.12%)**	**Discount Rate (2.12%)**	**1% Increase (3.12%)**
Total OPEB liability	$ 554,745	$ 474,485	$ 410,209

The following tables present the FY22 and FY21 total OPEB liability for the University, calculated using the current healthcare cost trend rates as well as what the University's total OPEB liability would be if it were calculated using trend rates that are 1 percentage point lower or 1 percentage point higher than the current trend rates.

(dollars in thousands)

Fiscal Year 2022	1% Decrease	Current Trend Rate	1% Increase
Total OPEB liability	$ 371,706	$ 436,372	$ 518,167

Fiscal Year 2021	1% Decrease	Current Trend Rate	1% Increase
Total OPEB liability	$ 396,532	$ 474,485	$ 574,537

4. OPEB Expense and Deferred Outflows of Resources and Deferred Inflows of Resources Related to OPEB

OPEB expense for the fiscal year ended June 30, 2022 and 2021 is summarized as follows:

OPEB Expense	FY22	FY21
Service cost	$ 15,745	$ 13,582
Interest on total OPEB liability	10,251	14,661
Recognition of deferred outflows/inflows of resources		
Recognition of economic/demographic gains or losses	(24,923)	(23,208)
Recognition of assumption changes or inputs	1,319	9,161
OPEB expense	**$ 2,392**	**$ 14,196**

Deferred outflows and inflows of resources as of June 30, 2022 and 2021 are summarized as follows:

Fiscal Year 2022	Deferred Inflows of Resources	Deferred Outflows of Resources
Difference between expected and actual experience	$ (74,092)	$ 4,399
Changes of assumptions	(36,993)	48,759
Contributions after measurement period	-	4,944
TOTAL	**$ (111,085)**	**$ 58,102**

Fiscal Year 2021	Deferred Inflows of Resources	Deferred Outflows of Resources
Difference between expected and actual experience	$ (92,275)	$ 6,753
Changes of assumptions	(14,563)	69,209
Contributions after measurement period	-	8,511
TOTAL	**$ (106,838)**	**$ 84,473**

Deferred outflows of resources resulting from contributions after the measurement period totaling $4,944 and $8,511 will be recognized as a reduction of the total OPEB liability in the year ended June 30, 2022 and June 30, 2021, respectively. Other amounts reported as deferred outflows of resources and deferred inflows of resources related to OPEB will be recognized in OPEB expenses as follows:

For the Fiscal Year Ending June 30	OPEB Expense
2023	$ (16,482)
2024	(13,573)
2025	(15,447)
2026	(9,557)
2027	(2,867)
Thereafter*	-

** Note that additional future inflows and outflows of resources may impact these numbers.*

(dollars in thousands)

L. Operating Expenses by Function

Operating expenses by functional classification for the years ended June 30, 2022 and 2021 are summarized as follows:

	Year ended June 30, 2022				
Function	Compensation And Benefits	Supplies And Services	Depreciation	Scholarships And Fellowships	Total
Instruction	$ 140,115	$ 18,917	$ -	$ -	$ 159,032
Research	70,135	39,806	-	-	109,941
Public service	44,061	14,448	-	-	58,509
Academic support	61,286	13,560	-	-	74,846
Student services	28,543	10,978	-	-	39,521
Institutional support	37,928	12,531	-	-	50,459
Operations and maintenance of plant	29,613	17,958	-	-	47,571
Scholarships and fellowships	-	-	-	39,935	39,935
Auxiliary enterprises	28,470	50,454	-	-	78,924
Depreciation	-	-	39,499	-	39,499
TOTAL	**$ 440,151**	**$ 178,652**	**$ 39,499**	**$ 39,935**	**$ 698,237**

	Year ended June 30, 2021				
Function	Compensation And Benefits	Supplies And Services	Depreciation	Scholarships And Fellowships	Total
Instruction	$ 145,291	$ 14,893	$ -	$ -	$ 160,184
Research	67,244	34,632	-	-	101,876
Public service	48,456	18,285	-	-	66,741
Academic support	60,616	14,342	-	-	74,958
Student services	27,233	21,006	-	-	48,239
Institutional support	34,238	10,655	-	-	44,893
Operations and maintenance of plant	29,103	14,019	-	-	43,122
Scholarships and fellowships	-	-	-	29,954	29,954
Auxiliary enterprises	27,253	44,469	-	-	71,722
Depreciation	-	-	33,174	-	33,174
TOTAL	**$ 439,434**	**$ 172,301**	**$ 33,174**	**$ 29,954**	**$ 674,863**

(dollars in thousands)

Required Supplementary Information - Post Employment Benefits Schedule of Changes in the University's Total OPEB Liability and Related Ratios

Total OPEB Liability	**FY22**	**FY21**	**FY20**	**FY19**	**FY18**
Service cost	$ 15,745	$ 13,582	$ 13,452	$ 15,645	$ 14,434
Interest on total OPEB liability	10,251	14,661	19,063	17,175	18,066
Changes of benefit terms	-	-	-	-	
Effect of economic/demographic gains or (losses)	(9,093)	(117,836)	9,862	1,395	847
Effect of assumption changes or inputs	(41,561)	51,272	45,175	(48,429)	4,085
Benefit payments	(13,455)	(17,225)	(17,853)	(18,029)	(16,058)
Net change in total OPEB liability	**(38,113)**	**(55,546)**	**69,699**	**(32,243)**	**21,374**
Total OPEB liability, beginning	474,485	530,031	460,332	492,575	471,201
Total OPEB liability, ending	**$ 436,372**	**$ 474,485**	**$ 530,031**	**$ 460,332**	**$ 492,575**
Covered-employee payroll	$ 259,184	$ 258,395	$ 258,395	$ 241,981	$ 241,981
Total OPEB liability as a % of covered-employee payroll	168.36%	183.63%	205.12%	190.23%	203.56%

This schedule is presented to illustrate the requirement to show information for 10 years. However, recalculations of prior years are not required, and if prior years are not reported in accordance with the current GASB standards, they should not be reported.

Notes to Schedule:

Changes of assumptions. Changes of assumptions and other inputs reflect the effects of changes in the discount rate each period. The following are the discount rates used in each period:

2022	2.06%
2021	2.12%
2020	2.74%
2019	4.10%
2018	3.44%

The University of Vermont

UNIVERSITY FINANCIAL SERVICES
333 WATERMAN BUILDING
85 SOUTH PROSPECT STREET
BURLINGTON, VT 05405
802 656-2903 www.uvm.edu

Attachment K-5

Structural Assessment Letter

The University of Vermont

PHYSICAL PLANT DEPARTMENT
284 EAST AVENUE
P.O. BOX 50501
BURLINGTON, VERMONT 05405-0501
(802) 656-2186

September 21, 2012

Jeff Rogers
Environmental Compliance Project Manager
Risk Management and Safety Department
The University of Vermont
667 Spear Street
Burlington, VT 05405

September 24, 2012

Dear Jeff:

I conducted a site visit on Friday, September 21, 2012, of the Environmental Safety Facility on 667 Spear Street, Burlington, Vermont. This building is very well constructed, with a steel frame, masonry block walls, and concrete foundations. I did not observe any structural issues with this building, and I would anticipate that it would be usable for another 50 years, with routine and deferred maintenance.

See attach photos of the building and building construction. Thank you.

Luce Hillman, P.E.
Assistant Director of Engineering
Physical Plant Department
284 East Avenue
Burlington, VT 05405

Photos of 667 Spear Street,
Exterior Condition

Appendix L

Corrective Action Summary

General Information:
The University of Vermont and State Agricultural College (UVM) Environmental Safety Facility (UVM ESF), EPA ID# VTD000636563, is an active, permitted hazardous waste treatment and storage facility and therefore subject to RCRA Corrective Action.

Current Milestone Determination:
CA900NC- Corrective Action Performance Standards Attained –No Controls Necessary. This milestone indicates remedies selected for the protection of human health and the environment standard have been fully implemented and associated performance standards have been attained at the entire facility or specific areas within the facility and no controls are necessary.

Date of Milestone Determination: September 17, 2021

Historic Information:
A baseline hydrogeologic investigation was performed in 1990 prior to construction of the ESF and groundwater monitoring wells were installed. Groundwater sampling results from September 1994 showed low levels of Volatile Organic Compounds (VOCs) and lead, which prompted a request for further monitoring by the Vermont Department of Environmental Conservation (VTDEC) Sites Management Section (SMS). Groundwater monitoring occurred in June 1995 through September 1996. Following the September 1996 sampling event, the following was determined by the VTDEC SMS:

- Contaminant concentrations detected in the groundwater beneath and in the vicinity of the site are below the applicable Vermont Groundwater Enforcement Standards (VGES) and Vermont Health Advisory Level (VHAL) and do not pose a significant threat to human health and the environment.
- No quantifiable impact or risk to receptors has been identified from the contamination detected onsite. The closest identified receptor would be the UVM's animal facility/barn located 150' to the east of the site.
- The ESF is not required to perform additional environmental work in response to the groundwater contamination detected in 1994.

On February 11, 1997, the VTDEC SMS issued a letter indicating that Sites Management Activity completed letter (Attachment L-1). Additionally, up until 2014, groundwater sampling for VOCs continued to be conducted as part of a class project at UVM (Attachment L-2). Subsequent groundwater sampling events showed no detections of VOCs at the three wells sampled.

Attachment L-1

Site Management Activity Completed Letter

State of Vermont

Department of Fish and Wildlife
Department of Forests, Parks and Recreation
Department of Environmental Conservation
State Geologist
RELAY SERVICE FOR THE HEARING IMPAIRED
1-800-253-0191 TDD>Voice
1-800-253-0195 Voice>TDD

AGENCY OF NATURAL RESOURCES
Department of Environmental Conservation
Waste Management Division
103 South Main Street / West Building
Waterbury, Vermont 05671-0404
802-241-3888
Fax 802-241-3296

February 11, 1997

MILLY ARCHER, HAZARDOUS WASTE MANAGER
RISK MANAGEMENT DEPARTMENT
UNIVERSITY OF VERMONT
PO BOX 50570
BURLINGTON VT 05405-0570

RE: Sites Management Activity Completed at the UVM-Environmental Safety Facility / SMS Site #95-1786

Dear Ms. Archer:

The Sites Management Section (SMS) has received the results of the annual groundwater monitoring at the UVM Environmental Safety Facility located in Burlington, Vermont. The most recent round of groundwater samples was collected on September 23, 1996, by Hoffer & Associates, and analyzed for the presence of volatile organic compounds using EPA Method 8260. The compound dichlorodifluoromethane was detected in the groundwater, but at a concentration below regulatory standards. Based on the results of the ongoing monitoring at this site, the SMS has concluded the following:

- Contaminant concentrations detected in the groundwater beneath and in the vicinity of the site do not pose a significant threat to human health and the environment;

- No quantifiable impact or risk to receptors has been identified from the contamination detected onsite;

As a result of the above, the SMS has determined that site management activities have been completed. However, the completion of these activities does not release UVM from any past or future liability which may arise from the contamination detected at this site. It does mean that the SMS is not requiring any additional environmental work be performed at this site in response to the groundwater contamination detected in 1994.

The SMS appreciates UVM's cooperation in conducting the necessary investigation at this site. If you have any questions, then please feel free to contact Linda Elliott at 241-3897 or myself at 241-3491.

Sincerely,

George Desch, P.E. ,Chief
Sites Management Section

c: Gary Urich, WMD
Jefferson Hoffer
Ruth Stokes, Burlington City Clerk
DEC Regional Office

GD:le/wp51/sites/1786smac.1296

Attachment L-2

Groundwater Summary of VOCs

The University of Vermont - Environmental Safety Facility (ESF)

Groundwater Summary of VOCs*

Well #P2-S (ug/L)

Date	dichlorodifluoromethane	chloromethane	vinyl chloride	chloroethane	acetone
9/30/94	1.30	<1	<1	<1	<1
6/22/95	trace	<1	<1	<1	<1
9/18/95	<1	<1	<1	<1	<10
9/23/96	2.00	<1	<1	<1	<10
9/19/97	0.80	<1	<1	<1	<10
10/1/98	2.40	<1	<1	<1	<10
9/27/99	<1	<1	<1	<1	<10
10/20/00	<1	<10	<2	<5	NA
10/10/02	<2	<10	<2	<5	<20
11/5/03	<2	<3	<2	<5	<10
11/3/06	1.70	<3	<2	<5	<10
11/19/09	<2	<3	<2	<5	<10
12/3/12	<5	<5	<5	<2	**
11/5/13	<5	<3	<2	<5	<10
9/30/14	<5	<3	<2	<5	<10

Well #P3-S (ug/L)

Date	dichlorodifluoromethane	chloromethane	vinyl chloride	chloroethane	acetone
9/30/94	26.00	18.00	1.10	<1	<1
6/22/95	<1	6.50	<1	<1	<1
6/22/95	<1/<1	5.9/6.4	1.1/1.1	1.4/<1	19/<1
9/18/95	<1/<1	1.1/1.1	<1	<1	<10
9/23/96	2.00	<1	<1	<1	<10
9/19/97	2.70	<1	<1	<1	<10
10/1/98	1.60	<1	<1	<1	<10
9/27/99	0.80	<1	<1	<1	<10
10/20/00	<1	<10	<2	<5	NA
10/10/02	<2	<10	<2	<5	<20
11/5/03	<2	<3	<2	<5	<10
11/3/06	<1	<3	<2	<5	<10
11/19/09	<2.0	<3.0	<2.0	<5.0	<10
12/3/12	<5	<5	<5	<2	**
11/5/13	<5.0	<3.0	<2.0	<5.0	<10
9/30/14	<5.0	<3.0	<2.0	<5.0	<10

Well #P5-S (ug/L)

Date	dichlorodifluoromethane	chloromethane	vinyl chloride	chloroethane	acetone
9/30/94	26.00	18.00	1.10	<1	<1
11/3/95	12.00	<1	0.97	<1	<1
6/22/95	<1	30.00	5.10	14.00	<1
9/18/95	<1	5.50	<1	<1	<10
9/23/96	12 / 12	<1	<1	<1	<10
9/19/97	8.2 / 8.3	<1	<1	<1	<10
10/1/98	6.40	<1	<1	<1	<10
9/27/99	3.00	<1	<1	<1	<10
10/20/00	<1	<10	<2	<5	NA
10/10/02	<2	<10	<2	<5	<20
11/5/03	<2	<3	<2	<5	<10
11/3/06	<1	<3	<2	<5	<10
11/19/09	<2	<3	<2	<5	<10
12/3/12	<5	<5	<5	<2	**
11/5/13	<5	<3	<2	<5	12.00
9/30/14	<5	<3	<2	<5	<10

**Based on data reported in ESF 2014 Groundwater monitoring report. Sampling last conducted by ENVS 160 class on 9/30/2014.*

Appendix M

Related Permits

National Historic Preservation Act
Activities at the Environmental Safety Facility do not adversely affect the congressional declarations or findings of the National Historic Preservation Act of 1966 as amended in 2000. The effects of the construction of the ESF on this Act was properly considered during the Environmental Review Process in 1992, supporting documents can be found in that application (Act 250 permit).

Endangered Species Act
Activities at the Environmental Safety Facility do not adversely affect conservation of the ecosystems upon which endangered species and threatened species depend, nor the conservation of such endangered species and threatened species, nor any other purpose of the Endangered Species Act of 1973 nor its amendments. The effects of the construction of the ESF on this Act was properly considered during the Environmental Review Process in 1992, supporting documents can be found in that application (Act 250 permit).

Coastal Zone Management Act
Activities at the Environmental Safety Facility do not affect development or management of coastal zones, nor any of the purposes of the Coastal Zone Management Act of 1972 nor its amendments. Stormwater and wastewater permits were properly considered during the Environmental Review Process in 1992, supporting documents can be found in that application (Act 250 permit).

Fish & Wildlife Coordination Act
Activities at the Environmental Safety Facility do not adversely affect conservation of neither wildlife nor any of the purposes of the Fish and Wildlife Coordination Act of 1936 or its amendments. Stormwater and wastewater permits were properly considered during the Environmental Review Process in 1992, supporting documents can be found in that application (Act 250 permit).

The Wild and Scenic Rivers Act
Activities at the Environmental Safety Facility do not adversely affect conservation of wild, scenic or recreational river areas nor any of the purposes of the Wild and Scenic Rivers Act of 1983 nor its amendments. Stormwater and wastewater permits were properly considered during the Environmental Review Process in 1992, supporting documents can be found in that application (Act 250 permit).

Air Emissions Standards
ESF activities operate under Air Pollution Control Permit #AP-04-006 issued by Vermont's Air Pollution Control Division on 19 April 2004; the permit and the technical analysis are included as attachments M-1.

The ESF mechanical systems are designed to protect workers by removing emissions from their work zone; these systems are not equipped with emission control devices.

Hazardous wastes at the ESF are managed in containers only. All volatile organic wastes are stored in containers that meet the applicable DOT regulations on packaging hazardous materials

and that have a design capacity of less than 111 gallons (0.42 cubic meters). Each container is equipped with a cover or closure device that meets the requirements of 40CFR§264.1086(c) and that is maintained in the closed position except when:

- Waste is being added to or removed from the container,
- Access to the waste is needed for sampling or other routine activities,
- Pressure relief is necessary for maintaining the internal pressure of the container, or
- Conditions require operating a safety device to avoid an unsafe condition.

Containers and covers are inspected when first put in service at the ESF or accepted at the ESF and as part of the daily inspection (See Appendix I) to ensure that they are free of visible cracks, gaps, holes or other open spaces into the interior of the container when the cover is secured in the closed position.

When a defect is detected, the container will be repaired or overpacked or the contents will be transferred to another container that meets the requirements of 40CFR§264.1086(c). Procedures to remedy the defect will begin as soon as possible after detection and within 24 hours; these procedures will be complete within 5 calendar days after detection.

Stormwater - Conditional Exclusion from the Multi-Sector General Permit, No Exposure Certification

The Environmental Safety Facility qualifies for the No Exposure Certification, Conditional Exclusion from the Multi-Sector General Permit, Attachment M-2, because all industrial materials and activities, are protected by a storm resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff.

The storage, loading and unloading, and transportation of waste at the ESF is all completed within covered vehicles or within the building. Waste handling for transportation, either ESF personnel or vendors for off-site transport, occurs at the loading dock. The loading dock is fully enclosed within the building.

Drums and other waste containers, new or in use, are only stored inside the facility.

Vehicles are typically stored at the loading dock and within the truck bay, except while in use or during business hours, during which they may be stored in the parking area. All vehicles are adequately maintained by UVM's Automotive Repair Shop and inspected regularly.

Attachment M-1

Air Pollution Control Permit

#AP-04-006
DEC# EJ74-0001

State of Vermont
Agency of Natural Resources
Department of Environmental Conservation

Air Pollution Control Division
Waterbury, Vermont

AIR POLLUTION CONTROL PERMIT TO CONSTRUCT

Date Permit Issued: April 19, 2004

Owner/Operator:	University of Vermont Waterman Building 85 South Prospect Street Burlington, Vermont 05405
Source:	UVM Environmental Safety Facility 667 Spear Street Burlington, Vermont 05405

FINDINGS OF FACT

(A) FACILITY DESCRIPTION

The University of Vermont (also referred to herein as "Permittee") owns and operates a permitted treatment, storage and disposal facility located at the BioResearch Complex on the west side of Spear Street in Burlington, Vermont (also referred to herein as "Facility"). The Facility is designed to serve as a storage and management area for hazardous wastes and houses a chemical distribution and resource recovery center. The Permittee has proposed to modify the pouring volumes and frequencies outlined in the existing permit for the following chemicals: benzene, chloroform, trichloroethylene, ethylene dichloride, methylene chloride and aniline. These chemicals are released through the bulking and consolidation of waste materials.

(B) FACILITY CLASSIFICATION

The Facility is classified as a source of air contaminants pursuant to Title 10 of the *Vermont Statutes Annotated* ("10 *VSA.*") §555 and §5-401 (11), Manufacturing, processing and application of chemicals, including the processing or application of plastics, rubbers or resins of the *Vermont Air Pollution Control Regulations* (hereinafter "*Regulations*"). In addition, §5-101 of the *Regulations* defines a *stationary source* as any structure(s), equipment, installation(s), or operation(s), or combination thereof, which emit or may emit any air contaminant, which is located on one or more contiguous or adjacent properties and which is owned or operated by the same person or persons under common control. Based on this definition, all of the equipment, operations, and structures at the Facility are grouped together by the Agency of Natural Resources, Department of Environmental Conservation, Air Pollution Control Division (hereinafter "Agency") as one stationary air contaminant source for purposes of review under the *Regulations*.

(C) PRIOR AGENCY ACTIONS/APPROVALS

The Facility has been issued the following "Permit to Construct" approval pursuant to 10 *VSA* §556 and §§5-501 and/or 5-502 of the *Regulations*.

Prior Agency Approvals and Actions	
Date of Action	Description of Agency Approval/Action
April 22, 1994	#AP-92-024 – Original Agency Permit to Construct approval for Facility.

(D) FACILITY PERMIT APPLICABILITY

As noted above, the Facility is classified as a source of air contaminants under §5-401 of the *Regulations*. Pursuant to 10 *VSA* §556 and §5-501 of the *Regulations* a Permit to Construct, or an amendment to any existing Permit to Construct, must be obtained before commencing the construction, installation, modification or operation of an air contaminant source. The proposed changes in pouring volumes and frequencies of the above listed chemicals is not considered a modification to the Facility under the *Regulations* however, the Agency is considering the proposed changes a technical amendment and consequently, a modified Permit to Construct must be obtained.

Allowable emissions from the Facility are estimated to be less than ten (10) tpy combined and therefore the Facility is not required to obtain a Permit to Operate consistent with the requirements of Subchapter X of the *Regulations*. The allowable emissions for the Facility are summarized below:

Future Allowable Air Contaminant Emissions (tons/year)[1]						
PM/PM_{10}	SO_2	NO_x	CO	VOCs	Total Criteria	HAPs[2]
0.06	0.10	1.37	0.70	0.35	<10	<1

[1] PM/PM_{10} - particulate matter and particulate matter of 10 micrometers in size or smaller; SO_2 - sulfur dioxide; NO_x - oxides of nitrogen measured as NO_2 equivalent; CO - carbon monoxide; VOCs - volatile organic compounds; HAPs - hazardous air pollutants as defined in §112 of the federal Clean Air Act.

[2] Emissions of individual HAPs each < 10 tpy and emissions of total HAPs combined <25 tpy. Actual total combined HAPs estimated at <1 tpy.

(E) REVIEW FOR THE PERMIT TO CONSTRUCT

(a) New Source Review Designation

The Facility, prior to implementation of the proposed modification, is designated as a non-major stationary source of air contaminants since it does not have allowable emissions of a single air contaminant of fifty (50) tons per year or greater. Consequently, any *modification* of the source that would result in a major increase in emissions of any air contaminant, as defined in §5-101 of the *Regulations*, is designated as a major modification and is subject to review under §5-501 and §5-502 of the *Regulations*. The proposed project identified in Findings of Fact (A) above, together with all previous minor modifications constructed at the Facility since July 1, 1979, and which have not been previously reviewed under §5-502 of the *Regulations*, will not result in a major increase in emissions. Consequently, the proposed modification is designated as a non-major modification and is not subject to the requirements of §5-502 of the *Regulations*.

(b) Most Stringent Emission Rate

Pursuant to §5-502 of the *Regulations*, the owner/operator of each new major stationary source or major modification must apply control technology adequate to achieve the Most Stringent Emission Rate ("MSER") with respect to those air contaminants for which there would be a major or significant actual emissions increase, respectively, but only for those currently proposed physical or operational changes which would contribute to the increased emissions.

The proposed project is designated as a non-major modification of a stationary source and therefore is not subject to review under the MSER requirements in §5-502 of the *Regulations*.

(c) Ambient Air Quality Impact Evaluation

An ambient air quality impact evaluation is performed to demonstrate whether or not a proposed project will cause or contribute to violations of the ambient air quality standards and/or significantly deteriorate existing air quality. The Agency's implementation procedures concerning the need for an ambient air quality impact evaluation under §5-406(1) of the *Regulations*, specifies that such analyses may be required when a project results in an allowable emissions increase of ten (10) tons per year or more of any air contaminant, excluding VOCs. Additionally, the Agency may require an air quality impact evaluation where the short-term allowable emission rates will significantly increase as a result of a project.

Based on the level of emissions from this Facility, it is not expected to cause or contribute to a violation of any ambient air quality standard or significantly deteriorate air quality. Therefore, an air quality impact evaluation was not required by the Agency for the proposed project.

(d) Applicable Requirements

The operations at the Facility are subject to the following state and federal laws and regulations, the requirements of which are embodied in the conditions of this Permit.

(i) *Vermont Air Pollution Control Regulations*:

Applicable Requirements from the Vermont Air Pollution Control Regulations
Section 5-211(2) - Prohibition of Visible Air Contaminants, Installations Constructed Subsequent to April 30, 1970.
Section 5-231(4) - Prohibition of Particulate Matter; Fugitive Particulate Matter.
Section 5-241 – Prohibition of Nuisance and Odor.
Section 5-271 – Control of Air Contaminants from Stationary Reciprocating Internal Combustion Engines.

Applicable Requirements from the Vermont Air Pollution Control Regulations
Section 5-402 – Written Reports When Requested.
Section 5-403 – Circumvention.
Subchapter VIII – Registration of Air Contaminant Sources.

(F) HAZARDOUS MOST STRINGENT EMISSION RATE

Pursuant to §5-261 of the *Regulations*, any stationary source whose current or proposed actual emission rate of a hazardous air contaminant ("HAC") is equal to or greater than the respective Action Level (found in Appendix C of the *Regulations*) shall achieve the Hazardous Most Stringent Emission Rate ("HMSER") for the respective HAC. Pursuant to §5-261(1)(b)(ii) of the *Regulations*, all fuel burning equipment which combusts virgin liquid or gaseous fuel is exempt from this section. The Facility is not expected to have regulated emissions of any HAC in excess of an Action Level. Therefore, the Facility is not subject to §5-261 of the *Regulations* at this time.

Based on the Agency's review of the Facility's application and the above Findings of Fact, the Agency concludes that the Facility, subject to the following Permit conditions, complies with all applicable state and federal air pollution control laws and regulations. Therefore, pursuant to 10 *VSA* §556, as amended, the Agency hereby proposes to issue a Permit approving the Facility, as described in the above Findings of Fact, subject to the following:

PERMIT CONDITIONS

- Construction and Equipment Specifications -

(1) The Permittee shall construct and operate the Facility in accordance with the plans and specifications submitted to the Agency and in accordance with the conditions set forth herein. [10 *V.S.A.* §556(c)]

(2) The exhaust gases from the Facility's ventilation system shall be vented vertically through a stack which extends a minimum of four (4) feet above the roofline. The Permittee shall at the request of the Agency increase the stack height of any respective stack if, in the judgment of the Agency based on inspections of the actual operations at the Facility, proper or adequate dispersion can not be maintained at the current stack height. The stack shall not be equipped with any device that may obstruct the upward discharge of the exhaust gases such as a fixed raincap. [10 *V.S.A.* §556(c)]

- Operational Limitations -

(3) The Permittee shall not pour, dispense, or engage in any other activity that releases hazardous vapors during the consolidation of chemical wastes at the Facility for a period of time that exceeds 8 hours per day. The Permittee shall not exceed the following pouring volumes for the chemical wastes listed below during any consecutive 30 day period:

Maximum Pouring Volumes	
Chemical	**Maximum monthly pouring volume (gallons)**
Chloroform	1.0
Trichloroethylene	10.0
Ethylene dichloride	2.5
Methylene chloride	26.0
Benzene	1.0
Aniline	20.0

[10 *V.S.A.* §§556(c) and 5-261 of the *Regulations*]

(4) The Permittee shall handle all chemical wastes in accordance with applicable Hazardous Waste Management Regulations. [10 *V.S.A.* §556(c)]

(5) The Permittee shall utilize only Liquified Petroleum Gas ("LPG") or natural gas in the fuel burning equipment installed and operated at the Facility. [10 *V.S.A.* §556(c)]

(6) Engines: The Permittee shall not install or operate a stationary reciprocating internal combustion engine, as defined in the *Regulations*, that is 450 bhp or greater unless the engine complies with §5-271 of the *Regulations*, as applicable. Engines installed after July 1, 1999 must comply with the emission standards of §5-271 of the *Regulations* immediately upon installation. Engines installed prior to July 1, 1999 must comply with the emission standards of §5-271 of the *Regulations* by no later than July 1, 2007. Installation of any size stationary reciprocating internal combustion engine may still require approval from the Agency in the form of an amended Permit prior to installation. Stationary reciprocating internal combustion engines include those used to power generator sets or to provide shaft power for equipment but does not include engines used to power motor vehicles. [§§5-501 and 5-271 of the *Regulations*]

- Emission Limitations -

(7) Emissions of visible air contaminants from any installation at the Facility, except where otherwise noted in this Permit, shall not exceed twenty (20) percent opacity for more than a period or periods aggregating six (6) minutes in any hour and at no time shall visible emissions exceed sixty (60) percent opacity. Any emission testing conducted to demonstrate compliance with the above emission limits shall be performed in accordance with the proposed Federal Reference Method F-1 contained in the Federal Register Vol.51, No.168, pp. 31076-31081, August 29, 1986 or an equivalent method approved in writing by the Agency. [§§5-211(2) and 5-404 of the *Regulations*]

(8) Particulate Matter: Emissions of particulate matter ("PM") from any fuel burning device, except motorized vehicles, with a heat input rating of less than ten (10) million British Thermal Units per hour ("MMBTU/hr") shall not exceed 0.5 pounds per MMBTU.

Any emission testing conducted to demonstrate compliance with the above emission limit shall be performed in accordance with 40 *CFR* Part 60, Appendix A, Reference Method 5 or an equivalent method approved in writing by the Agency. [§§5-231(3)(a)(i) and 5-404 of the *Regulations*]

(9) Volatile Organic Compounds: Emissions of volatile organic compounds from the Facility shall not equal or exceed fifty (50) tons per calendar year. [§5-501 of the *Regulations*]

(10) Hazardous Air Pollutants: Emission of federally regulated hazardous air pollutants (HAPs) from the Facility shall not equal or exceed ten (10) tons per year of any single HAP or twenty-five (25) tons per year of all HAPs combined per calendar year. [40 *CFR* Part 63]

(11) Hazardous Air Contaminants: Emissions of state hazardous air contaminants (HACs) from the applicable operations at the Facility shall not equal or exceed their respective Action Level (found in Appendix C of the *Regulations*) unless the Agency has reviewed and approved such HAC emission under §5-261 of the *Regulations*. [§5-261 of the *Regulations*]

(12) The Permittee shall not discharge, cause, suffer, allow, or permit from any source whatsoever such quantities of air contaminants or other material which will cause injury, detriment, nuisance or annoyance to any considerable number of people or to the public or which endangers the comfort, repose, health or safety of any such persons or the public or which causes or has a natural tendency to cause injury or damage to business or property. The Permittee shall not discharge, cause, suffer, allow, or permit any emissions of objectionable odors beyond the property line of the premises. [§5-241(1) and (2) of the *Regulations*]

- Record Keeping and Reporting -

(13) The Permittee shall maintain daily records of the total volume poured during each eight hour work day of each chemical specified in Condition (3) of this Permit. The Permittee shall also maintain annual records of the quantity of chemical wastes received and shipped out of the Facility. [10 *V.S.A.* §556(c)]

(14) All records shall be retained for a minimum period of five (5) years from the date of record and shall be made available to the Agency upon request. [§§5-402(1) and 5-405(1) of the *Regulations*]

(15) The Permittee shall notify the Agency in writing of any proposed physical or operational change at the Facility which may increase the emission rate of any air contaminant to the ambient air regardless of any concurrent emission reductions that may be achieved. If the Agency determines that a permit amendment is required, a new application and the appropriate application fee shall be submitted. The permit amendment shall be obtained prior to commencing any such change. [10 *V.S.A.* §556(c)] [§§5-402(1) and 5-501 of the *Regulations*]

(16) All records, reports, and notifications that are required to be submitted to the Agency by this Permit shall be submitted to:

Agency of Natural Resources
Air Pollution Control Division
103 South Main Street, Bldg 3 South
Waterbury, Vermont 05671-0402.

[§5-402(1) of the *Regulations*]

(17) The Permittee shall notify the Agency in writing within ten (10) days of any violation, of which it is aware, of any requirements of this Permit. This notification shall include, at a minimum, the cause for the violation and corrective action or preventative maintenance taken to correct the violation. [§5-402(1) of the *Regulations*]

(18) Annual Registration: The Permittee shall calculate the quantity of emissions of air contaminants from the Facility annually. If the Facility emits more than five (5) tons of any and all air contaminants per year, the Permittee shall register the source with the Secretary of the Agency (hereinafter "Secretary"), and shall renew such registration annually. Each day of operating a source which is subject to registration without a valid, current registration shall constitute a separate violation and subject the Permittee to civil penalties. The registration process shall follow the procedures set forth in Subchapter VIII of the *Regulations*, including the payment of the annual registration fee on or before May 15 of each year. [Subchapter VIII §§5-802, 5-803, 5-807 and 5-808 of the *Regulations*]

- Standard Permit Conditions -

(19) These Permit conditions may be suspended, terminated, modified, or revoked for cause and reissued upon the filing of a written request with the Secretary of the Agency (hereinafter "Secretary") or upon the Secretary's own motion. Any modification shall be granted only with the written approval of the Secretary. If the Secretary finds that modification is appropriate, only the conditions subject to modification shall be re-opened. The filing of a request for modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated non-compliance does not stay any terms or conditions of this Permit. The Secretary may provide opportunity for public comment on any proposed modification of these conditions. If public comments are solicited, the Secretary shall follow the procedures set forth in 10 *V.S.A.* §556, as amended. [10 *V.S.A.* §556(d)]

(20) The Permittee shall furnish to the Agency, within a reasonable time, any information that the Agency may request in writing to determine whether cause exists to modify, revoke, reissue, or terminate the Permit or to determine compliance with this Permit. Upon request, the Permittee shall also furnish to the Agency copies of records required to be kept by this Permit. [10 *V.S.A.* §556(c)] [§5-402(1) of the *Regulations*]

(21) By acceptance of this Permit, the Permittee agrees to allow representatives of the State of Vermont access to the properties covered by the Permit, at reasonable times, to ascertain compliance with Vermont environmental and health statutes and regulations and with this Permit. The Permittee also agrees to give the Agency access to review and copy any records required to be maintained by this Permit, and to sample or monitor at reasonable times to ascertain compliance with this Permit. [10 *V.S.A.* §556(c)] [§§5-402(1) and 5-404 of the *Regulations*]

(22) All data, plans, specifications, analyses and other information submitted or caused to be submitted to the Agency as part of the application for this Permit or an amendment to this Permit shall be complete and truthful. Any such submission which is false or misleading shall be sufficient grounds for denial or revocation of this Permit, and may result in a fine and/or imprisonment under the authority of Vermont statutes. [10 *V.S.A.* §556(c)] [§5-505 of the *Regulations*]

(23) For the purpose of establishing whether or not a person has violated or is in violation of any condition of this Permit, nothing in this Permit shall preclude the use, including the exclusive use, of any credible evidence or information relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed. [10 *V.S.A.* §556(c)]

(24) Any permit noncompliance could constitute a violation of the federal Clean Air Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. [10 *V.S.A.* §556(c)]

(25) It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the conditions of this Permit. [10 *V.S.A.* §556(c)]

(26) No person shall build, erect, install or use any article, machine, equipment or other contrivances, the use of which, without resulting in a reduction in the total release of air contaminants to the atmosphere, reduces or conceals an emission which otherwise would constitute a violation of these *Regulations*. [§5-403 of the *Regulations*]

(27) The provisions of this Permit are severable. If any provision of this Permit, or its application to any person or circumstances is held invalid, illegal, or unenforceable by a court of competent jurisdiction, the invalidity shall not apply to any other portion of this Permit which can be given effect without the invalid provision or application thereof. [10 *V.S.A.* §556(c)]

(28) This Permit does not convey any property rights of any sort or any exclusive privilege, nor does it authorize any injury to private property or any invasion of personal rights. [10 *V.S.A.* §556(c)]

(29) All subsequent owners and/or operators of this Facility must request an amendment and transfer of this Permit prior to commencing any operations covered by this Permit. All subsequent owners and/or operators shall submit to the Agency as part of the request for amendment all such information the Agency deems necessary to establish legal ownership and/or interest in the property and all such information the Agency deems necessary to ensure the new owners and/or operators will construct and operate the Facility in compliance with the *Regulations* and this Permit. The terms and conditions of this Permit shall remain in full force and effect after submittal of the request for amendment and until the issuance of an amended Permit or denial. Should the Secretary deny the request, the new owner and/or operator must take whatever action is necessary to comply with the denial. [10 *V.S.A.* §556] [§5-501 of the *Regulations*]

(30) The conditions of this Permit as set forth above supercede all conditions contained in all prior Permits issued by the Agency to the Permittee for this Facility. [10 *V.S.A.* §§556(c)]

The Agency's issuance of this Air Pollution Control Permit relies upon the data, judgement, and other information supplied by the Permittee. The Agency makes no assurances that the air contaminant source approved herein will meet performance objectives or vendor guarantees supplied to the source Permittee. It is the sole responsibility of the Permittee to operate the source in accordance with the conditions herein and with all applicable state and federal standards and regulations.

Dated this 19th day of April, 2004, in the town of Waterbury, county of Washington, state of Vermont.

Agency of Natural Resources

Jeffrey Wennberg, Commissioner
Department of Environmental Conservation

By: Richard A. Valentinetti
Richard A. Valentinetti, Director
Air Pollution Control Division

jh
A2 University of Vermont, Environmental Safety Facility - Burlington

Attachment M-2

Stormwater No Exposure Certification Conditional Exclusion from the Multi-Sector General Permit

VERMONT

Vermont Department of Environmental Conservation
Water Quality Division
103 South Main Street, Building 10 North
Waterbury, VT 05671-0408

Agency of Natural Resources

[phone] 802-338-4889

MD
BB
BV

December 8, 2011

University of Vermont
attn: Richard Cate, VP of Finance and Administration
350 Waterman Building
85 Prospect Street
Burlington, VT 05405

Re: No Exposure Certification No. 5269-9003.R

Dear Mr. Cate,

The Department of Environmental Conservation has reviewed the No Exposure Certification for Conditional Exclusion from the Multi-Sector General Permit (MSGP) 3-9003 (NPDES# VTR050001) from the University of Vermont & State Agricultural College submitted on August 22, 2011.

The UVM Environmental Safety Facility located on Spear Street in Burlington, Vermont has been assigned a Certification Number, noted above. Please note that the No Exposure exclusion from the requirement for coverage under the MSGP is conditional. Thus, in order to maintain eligibility for No Exposure status, facilities with No Exposure Certifications must comply with the No Exposure terms and conditions of the VT MSGP 3-9003 found in Part 1.6 of the MSGP. A copy of MSGP Section 1.6 is enclosed for your convenience.

If circumstances change and industrial materials or activities become exposed to rain, snow, snowmelt, and/or runoff, then you no longer qualify for conditional exclusion from the requirements of the MSGP and your discharge becomes subject to enforcement or a citizen suit as an un-permitted discharge. If you anticipate such changes in your circumstances you should prepare a Stormwater Pollution Prevention Plan (SWPPP) and apply for and obtain coverage under the MSGP prior to such change of circumstances.

If you have any questions, please call me at (802) 338-4889 or visit the website at www.vtwaterquality.org/stormwater.htm.

Sincerely,

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1.6 Conditional Exclusion for No Exposure.

If all of your industrial materials or activities are protected by a storm resistant shelter to prevent exposure to rain, snow, snowmelt and/or runoff then you may be eligible for a conditional exclusion from the requirements of this General Permit that require the preparation of a SWPPP and related monitoring of stormwater quality. To qualify for conditional exclusion, you must file an application and certification of No Exposure on forms provided by the Agency and receive approval from the Secretary. If you obtain coverage under this option you will be subject to the limitations and conditions set forth in this section with which you must comply in order to maintain eligibility for exclusion. The requirements pertaining to a demonstration that all your industrial materials or activities are protected by a storm resistant shelter to prevent exposure to rain, snow, snowmelt and/or runoff are set forth in Part 1.6.2 below.

If you meet the requirements of Part 1.6.2, and file a No Exposure Certification on forms provided by the Secretary you are no longer authorized by nor required to comply with this permit upon submission of a no exposure certification to the Agency. If you are no longer required to have permit coverage because of a no exposure exclusion and have submitted a No Exposure Certification form to the Agency, you are not required to submit an NOT.

1.6.1 Certification of No Exposure

In the event that you have elected to apply for conditional exclusion from permit requirements by certifying "No Exposure" as set forth in Part 1.6 of this general permit then you must submit a No Exposure Certification on forms provided by the Secretary.

1.6.2 Requirements to Demonstrate No Exposure

To demonstrate that all your industrial materials or activities are protected by a storm resistant shelter to prevent exposure to rain, snow, snowmelt and/or runoff you must:

1.6.2.1 Provide a storm resistant shelter to protect industrial materials and activities from exposure to rain, snow, snow melt, and runoff;

1.6.2.2 Demonstrate and certify that none of the following materials or activities are, or will be in the foreseeable future, exposed to precipitation:

- Using, storing or cleaning industrial machinery or equipment, and areas where residuals from using, storing or cleaning industrial machinery or equipment remain and are exposed to stormwater;
- Materials or residuals on the ground or in stormwater inlets from spills/leaks;
- Materials or products from past industrial activity;
- Material handling equipment (except adequately maintained vehicles);

- Materials or products during loading/unloading or transporting activities;
- Materials or products stored outdoors (except final products intended for outside use, e.g., new cars, where exposure to stormwater does not result in the discharge of pollutants);
- Materials contained in open, deteriorated or leaking storage drums, barrels, tanks, and similar containers;
- Materials or products handled/stored on roads or railways owned or maintained by the discharger;
- Waste material (except waste in covered, non-leaking containers, e.g., dumpsters);
- Application or disposal of process wastewater (unless otherwise permitted); and
- Particulate matter or visible deposits of residuals from roof stacks/vents not otherwise regulated, i.e., under an air quality control permit, and evident in the stormwater outflow.

1.6.3 Materials and Activities Which Need Not Be Sheltered to Demonstrate No Exposure

To demonstrate no exposure, storm resistant shelter is not required for the following industrial materials and activities:

1.6.3.1 Drums, barrels, tanks, and similar containers that are tightly sealed, provided those containers are not deteriorated and do not leak ("Sealed" means banded or otherwise secured and without operational taps or valves);

1.6.3.2 Adequately maintained vehicles used in material handling; and

1.6.3.3 Final products, other than products that would be mobilized in stormwater discharge (e.g., rock salt).

1.6.4 Limitations on No Exposure Demonstrations

1.6.4.1 The demonstration of no exposure can only be made on a facility-wide basis, not for individual outfalls. If a facility has some discharges of stormwater that would otherwise be No Exposure discharges, permit requirements under this permit may be adjusted accordingly for these discharges.

1.6.4.2 If circumstances change and industrial materials or activities become exposed to rain, snow, snowmelt, and/or runoff, then you no longer qualify for conditional exclusion from the requirements of this permit and your discharge becomes subject to enforcement as an un-permitted discharge. If you anticipate such

changes in your circumstances you should prepare a SWPPP and apply for and obtain coverage under this general permit prior to the change of circumstances.

1.6.4.3 Notwithstanding the provisions of this Part 1.6, the Secretary retains the authority to require coverage under this general permit (and deny coverage under this Part 1.6) upon making a determination that the discharge causes, has a reasonable potential to cause, or contributes to an instream excursion above an applicable water quality standard.

1.6.5 Conditions for Claiming and Maintaining No Exposure Status

In order to claim and maintain No Exposure status you must:

1.6.5.1 In accordance with the requirements set forth in Part 1.6, submit a signed certification of No Exposure stating that all your industrial materials or activities are protected by a storm resistant shelter to prevent exposure to rain, snow, snowmelt and/or runoff.

1.6.5.2 Submit the signed No Exposure certification forms to the Agency once every five years;

1.6.5.3 Allow the Agency to inspect the facility to determine compliance with the No Exposure conditions;

1.6.5.4 Allow the Agency to make any No Exposure inspection reports available to the public upon request;

1.6.5.5 For facilities that discharge through an MS4, upon request you must submit a copy of the certification of No Exposure to the MS4 operator, as well as allow inspection and public reporting by the MS4 operator; and

1.6.5.6 Any time there is a change in the owner or operator of your facility you must notify the Agency within 30 days of the change. The No Exposure form is non-transferable. If a new owner or operator takes over the facility, the new owner or operator must complete and submit a new form to claim No Exposure.

1.7 Alternative Permits.

1.7.1 Agency Requiring Coverage under an Alternative Permit.

The Secretary may require you to apply for and/or obtain authorization to discharge under either an individual NPDES permit or an alternative NPDES general permit. The Secretary may determine at his or her own discretion that an individual or an alternative general permit is required. The Secretary may require any person who files a NOI to apply for an individual permit if the discharge does not qualify for coverage under this general permit or the Secretary