Standard Operating Procedure –#COE-SOP-0002

Laboratory Researcher Commissioning Requirements

Facility: NMSU College of Engineering Laboratories

Written by: Juanita Miller, Safety Specialist, miljgh@nmsu.edu (575)-646-1292

Scope: This SOP describes requirements for work area labeling, chemical inventory and housekeeping as well as training required to work in a hazardous chemicals laboratory

Date: **November 10, 2017**
Revision: **Zero(0)**

Introduction:

This procedure describes the requirements to work in any Chemical Engineering Laboratory. These requirements include training, Experimental Safety Plans, work area assignments and labeling, chemical inventory, hazardous waste management and housekeeping.

These requirements are in conjunction with the COE Chemical Hygiene Plan. Training requirements are as assigned by the Department, Environmental Health and Safety (EH&S) and the COE Safety Specialist. Adherence to other policies include COE Working Alone or In Isolation.

Standard Operating Procedure Details:

Outline of Requirements in this document are as follows. See details below for each of these.

Researcher Training Requirements

a. EHS and Department Training required before unescorted lab access allowed
b. COE Safety Training as applicable

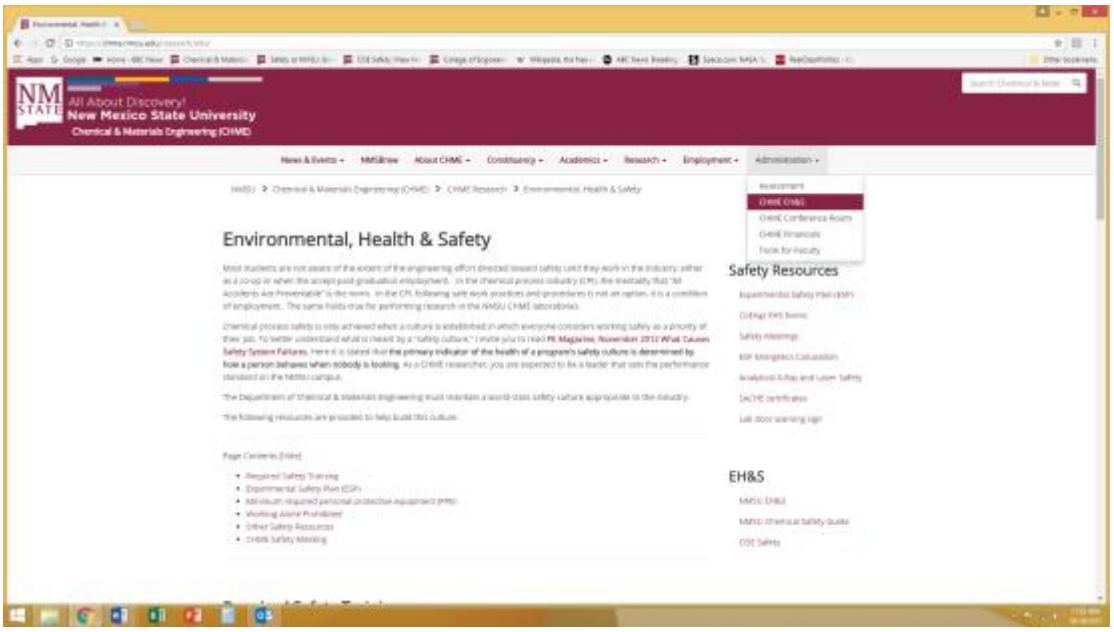
2. Experimental Safety Plan Requirements
3. Hood and/or Workspace Assignments
4. Labeling Requirements for workspaces
   a. Name Tags
   b. Drawer labels
   c. Workspace Shelf labels
   d. Refrigerator/freezer labels
5. Hazardous Waste Requirements
6. Chemical Inventory and Storage
   a. Bar code scanning into Quartyz
   b. Quartzy Owner Chemical Inventory

Appendices

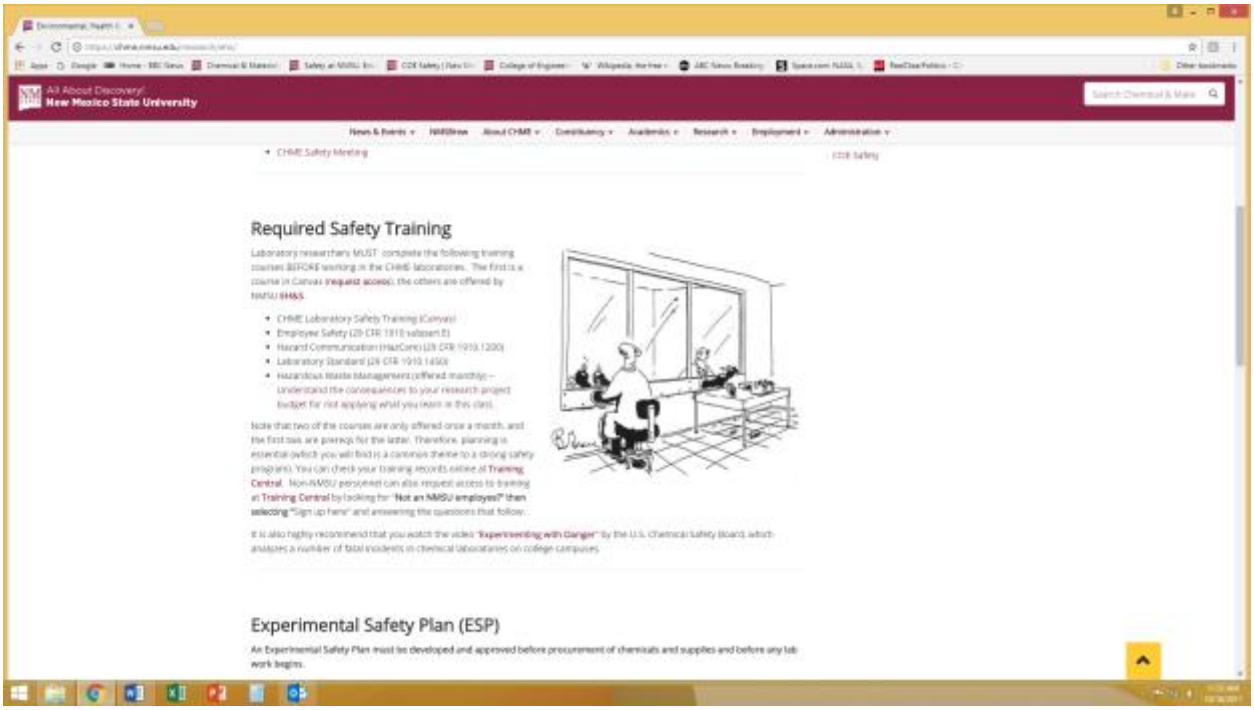
A Laboratory Researcher Commissioning Checklist
B Jett Hall Laboratory Maps
C Chemical Segregation and Storage Chart
D References

1. Training Requirements

a. EHS and Department required training requirements can be found on the Chemical Engineering Department's website under Administration and looking for the pull down menu for CHME EHS (https://chme.nmsu.edu/research/ehs/#Required_Safety_Training)



Scroll down until you see the list of required safety training classes



b. COE Safety Required Training

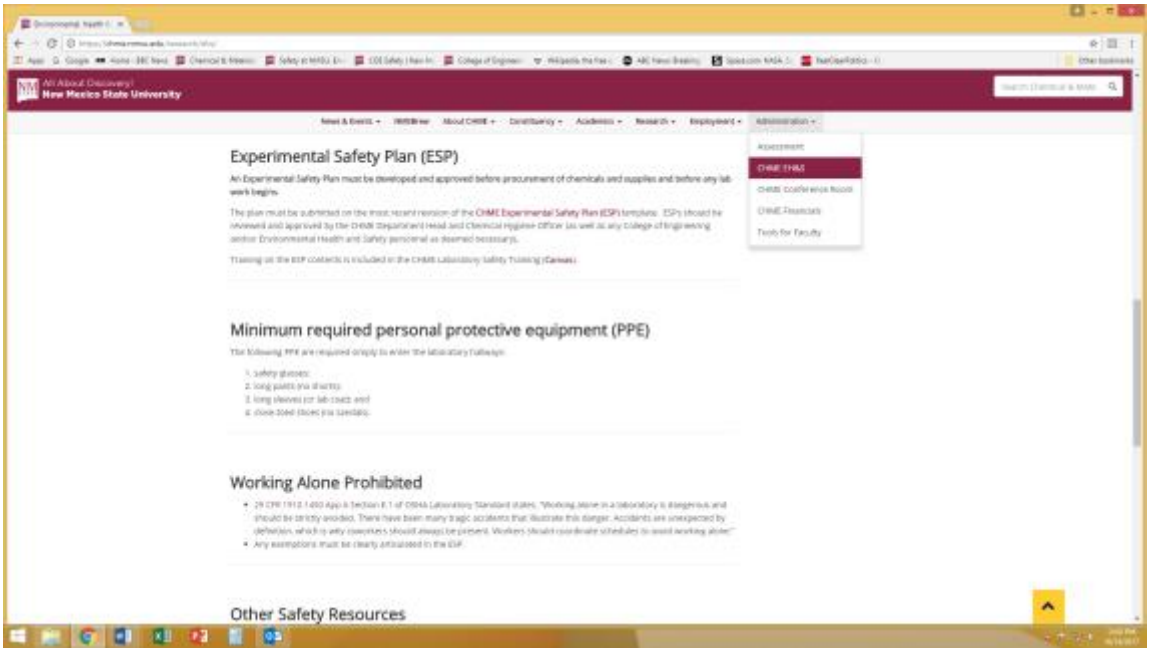
i. Special and/or Specific Training will be determined as part of the ESP Process

1. Specific hazards, such as cryogenic and carcinogenic materials, combustible dust, machine hazards etc., may require additional or special training. Consult with the COE Safety Specialist for additional details of requirements and offering locations.

2. Specific equipment training for items such as the fume hoods, biosafety cabinet, laser, centrifuge, etc. will frequently be required. Training will be provided by the Principal Investigator and/or the COE Safety Specialist.

2. Experimental Safety Plan

a. The researcher must have a signed Experimental Safety Plan to work in the lab. This document and its procedures can be found on the Chemical Engineering Department website at https://chme.nmsu.edu/research/ehs/



b. For new ESPs, always consult this website to use the most current template for the document. All signatures and approval from the COE Safety Specialist are required to begin work.

c. The ESP must be filled out per established procedure and have the following additional details included in the Experimental Scope in Attachment 1 and on the required drawing in Attachment 2. For new ESP's started after 12/01/17, this information must be provided in the contact information block and in the drawing in Attachment 2.

i. Identity of Fume Hood/Work Space
ii. Locations of drawers and shelves used by the researcher
iii. Location of chemical storage for those materials assigned to the researcher
iv. Location of any additional equipment needed for these experiments such as analytical tools in other buildings and lab spaces.
v. Identify which waste collection points used
vi. Details of transportation of samples if analysis will occur in another building or lab space.

3. Hood and Workspace Assignments
   a. Hoods and workspace will be assigned by either the COE Safety Specialist or the Chemical Engineering Department Lab Manager. A list of hood assignments can be found on the Chemical Engineering Department website.
   b. Request new or changes to space through those individuals
   c. Maps of the Jett Hall lab spaces are in Appendix B.
4. Labeling Requirements for Workspaces
   a. Name Tags →
      i. Each researcher using a hood or other workspace needs to prepare a name tag, place it in a clear holder and affix it to either the front of the fume hood or in a visible part of their workspace. Multiple name tags need to be affixed if more than one researcher is sharing the fume hood or work space even if one is the lead researcher and others are supporting the tasks.
      ii. You can find a template for name tags and refrigerator labels on the CHME EHS website. Use clear tape to attach the name tag holder to the fume hood.

b. Drawer Label →

i. Each drawer used by a researcher needs to be labeled with the following information:

1. Researcher name
2. Contents
3. Hazard Conditions if applicable (e.g. biological, combustible dust, etc.)

ii. A label maker is available for your use in the CHME Office

c. Shelf Label →

i. Each drawer used by a researcher needs to be labeled with the following information:

1. Researcher name
2. Contents
3. Hazard Conditions if applicable (e.g. biological, combustible dust, etc.)

ii. A label maker is available for your use in the CHME Office

d. Refrigerator/Freezer Label →

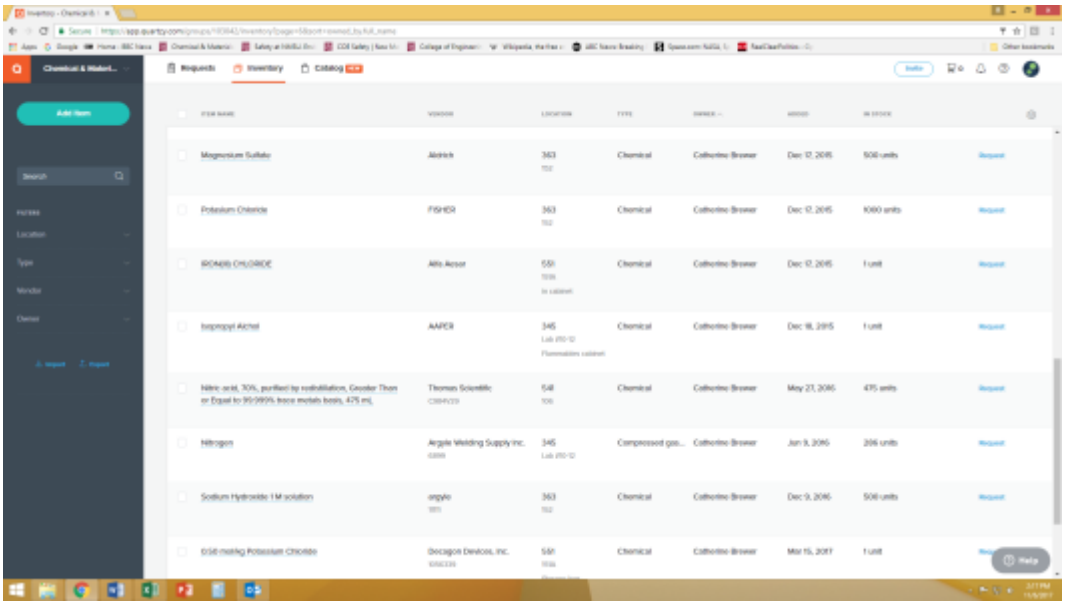
i. Most refrigerators and freezers are the responsibility of a single Principal Investigator but researchers share space to store their samples and/or chemicals. The outside of the refrigerator should have the following labels:

1. Chemical Inventory for entire refrigerator with owner names
2. Researcher name along with description of samples and approximate inventory (e.g. rack of 50 ml test tubes)
3. You can find a template for name tags and refrigerator labels on the CHME EHS website. Use clear tape to attach the name tag holder to the refrigerator or freezer.

5. Hazardous Waste Requirements
   a. A list of Waste Collection Points by PI can be found on the Chemical Engineering Department website. The researcher will identify their needs for combined or segregated waste collection in their ESP. Those containers will be stored in one of those waste collection points. The required NMSU Waste Tracking forms will be kept current by the researcher when the add materials to containers.
   b. The waste collection points will be monitored by the lab manager to determine when they are full and need to be picked up by NMSU EH&S.
6. Chemical Inventory and Storage
   a. All chemicals will be scanned into the Quartzy database, along with owner name, exact location, date purchased etc.
   b. Chemicals need to be segregated by flammable and corrosive materials per the chart in Appendix C and stored in appropriate cabinets. Use the cabinets provided under fume hoods for flammable and corrosive storage. Consult the lab manager or COE Safety Specialist for other storage questions.
   c. Some materials will require special storage conditions such as:
      i. Water or Air Reactive materials will be stored in the inert cabinet
      ii. Temperature sensitive materials will be stored in a refrigerator or freezer
      iii. Combustible or hazardous dust producing materials will be stored in containers appropriate to allow opening in restricted space, such as a glove box.

d. Low hazard dry materials may be stored on the open shelves in the fume hood workspace. These materials need to be stored in secondary containment such that they cannot be spilled or knocked off the shelves. The shelf needs to be labeled with appropriate information as shown in Paragraph 4 above.

e. Print the chemical inventory list from Quartzy using the following method. Use the export function on the left side of the screen to receive an excel spreadsheet.



This will generally contain the entire CHME inventory. You will need to sort this data to find those items you own. After you have your items together, print that part of the spreadsheet.

Quartes Chemical Inventory

N	[illegible]	Calcium Chloride			Catherine Brewer	360	152			500	g
N	[illegible]	Magnesium Sulfate	Aldrich		Catherine Brewer	360	152			500	g
N	[illegible]	Sodium Carbonate	Aldrich		Catherine Brewer	360	152			500	g
N	[illegible]	Sodium Sulfate anhydrous			Catherine Brewer	556	1514			500	g
N	[illegible]	Magnesium Chloride	FISHER		Catherine Brewer	360	152			500	g
N	[illegible]	Sodium Chloride	FISHER		Catherine Brewer	360	152			800	g
N	[illegible]	Potassium Chloride	FISHER		Catherine Brewer	360	152			1000	g
N	[illegible]	Calcium Carbonate	BAKER		Catherine Brewer	360	152			1000	g
N	[illegible]	Calcium Sulfate	BAKER		Catherine Brewer	360	152			50	g
N	[illegible]	Zinc Cloride	Sigma		Catherine Brewer	360	152			1000	g
N	[illegible]	CALCIUM SULFATE DIHYDRATE	BAKER		Catherine Brewer	360	152			400	g
N	[illegible]	IRON(III) CHLORIDE	Alfa Aesar		Catherine Brewer	556	1514	in cabinet		1	kg
N	[illegible]	Silicone oil	Dowco, Aldrich		Catherine Brewer	552	1514	in cabinet in secondary container		1	gal
N	[illegible]	0.50 mol/kg Potassium Chloride	Decagon Devices, Inc	10563138	Catherine Brewer	556	1514	Storage box	NA	1	L
N	[illegible]	Sodium Carbonate	Aldrich		Catherine Brewer	360	152			500	g
N	[illegible]	Sodium Chloride	FISHER		Catherine Brewer	360	152			800	g
N	[illegible]	Potassium Chloride	FISHER		Catherine Brewer	360	152			1000	g
N	[illegible]	Potassium Carbonate	Aldrich		Catherine Brewer	360	152			500	g
N	[illegible]	Calcium Carbonate	BAKER		Catherine Brewer	360	152			1000	g
N	[illegible]	CALCIUM SULFATE DIHYDRATE	BAKER		Catherine Brewer	360	152			400	g
N	[illegible]	Hydrochloric Acid 2N			Catherine Brewer	360	152	Storage Tub		500	mL
N	[illegible]	Calcium Chloride	Sigma Aldrich		Catherine Brewer	348	Lab #10-13	Plastic storage bin		20	g
N	[illegible]	Potassium Chloride	FISHER		Catherine Brewer	348	Lab #10-13	Plastic storage bin		20	g
N	[illegible]	Acetone	PHARMACO-AAPER		Catherine Brewer	348	Lab #10-13	Flammables cabinet		1	gal
N	[illegible]	Isopropyl Alcohol	AAPER		Catherine Brewer	345	Lab #10-13	Flammables cabinet		1	gal
N	[illegible]	Isopropyl Alcohol	Sivan		Catherine Brewer	345	Lab #10-13	Flammables cabinet		474	mL
N	[illegible]	Acetone	Acros		Catherine Brewer	345	Lab #10-13	Flammables cabinet		500	mL
N	[illegible]	Propylene Glycol	Plant Guru		Catherine Brewer	348	Lab #10-13	Plastic storage bin		473	mL
N	[illegible]	Nitric acid, 70%, purified by redistillation, Greater Than or Equal to 99.999% trace metals basis, 475 mL	Thomas Scientific	CR84V20	Catherine Brewer	541	188		216.13	475	mL
N	[illegible]	FLUKA Hydrochloric acid, ~30%, TraceSELECT®, for trace analysis, 500 mL	Thomas Scientific	CR92465	Catherine Brewer	541	188		92.79	500	mL
N	[illegible]	Sodium Hydroxide 1 M solution	argyle	11111	Catherine Brewer	360	152		5	500	mL
N	[illegible]	Sulfuric Acid 1 M	argyle	11111	Catherine Brewer	360	152		5	500	mL
N	[illegible]	Potassium Hydroxide			Catherine Brewer	552	1514			20	g

11/5/2017

f. Print a copy of the chemical inventory for the fume hood and/or workspace, placed it in a clear sleeve and affix it to the side of the hood with the name tags. This inventory needs to be kept current with any changes to ESPs.

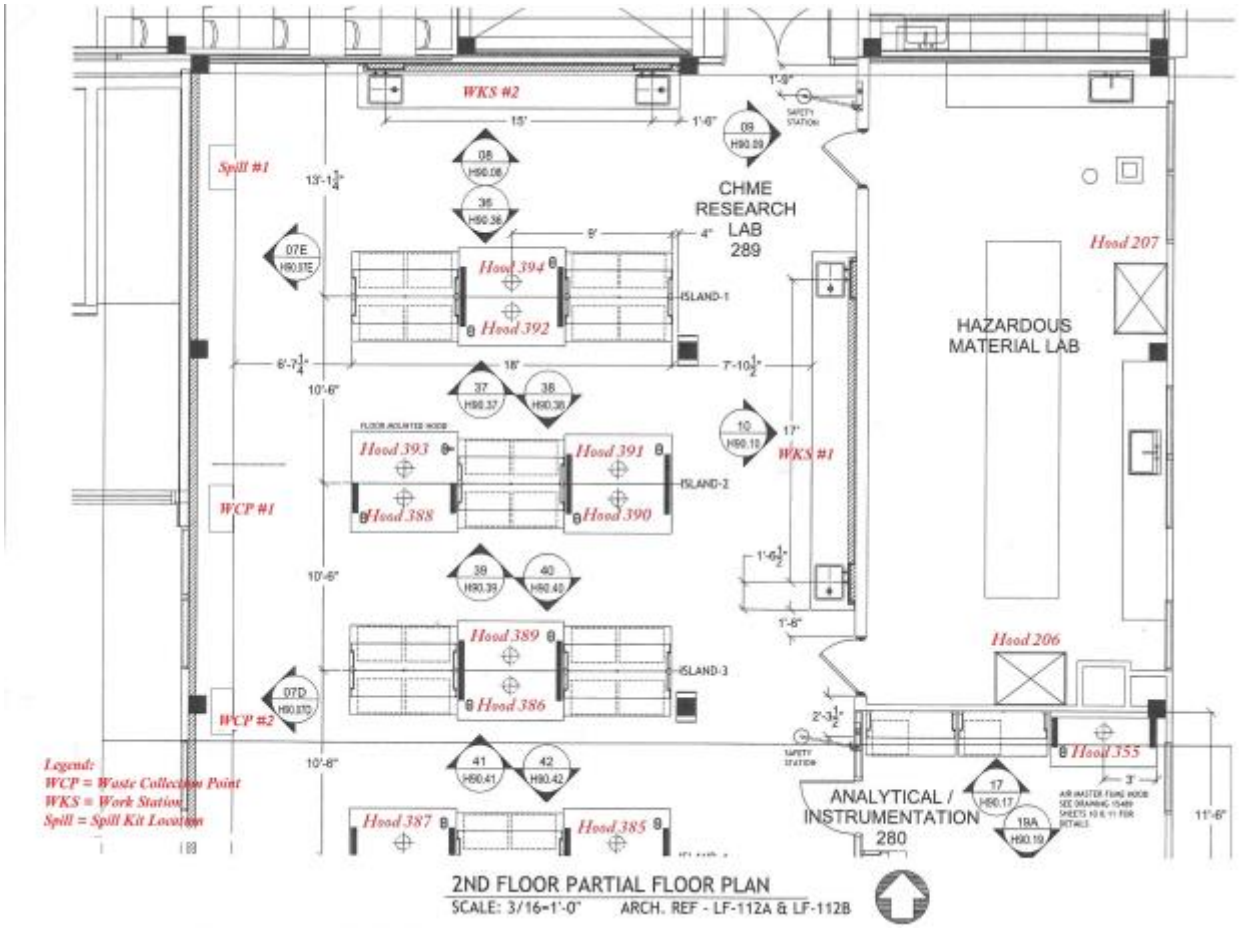
Appendix A - Laboratory Researcher Commissioning Checklist

CHME – Researcher Commissioning Checklist

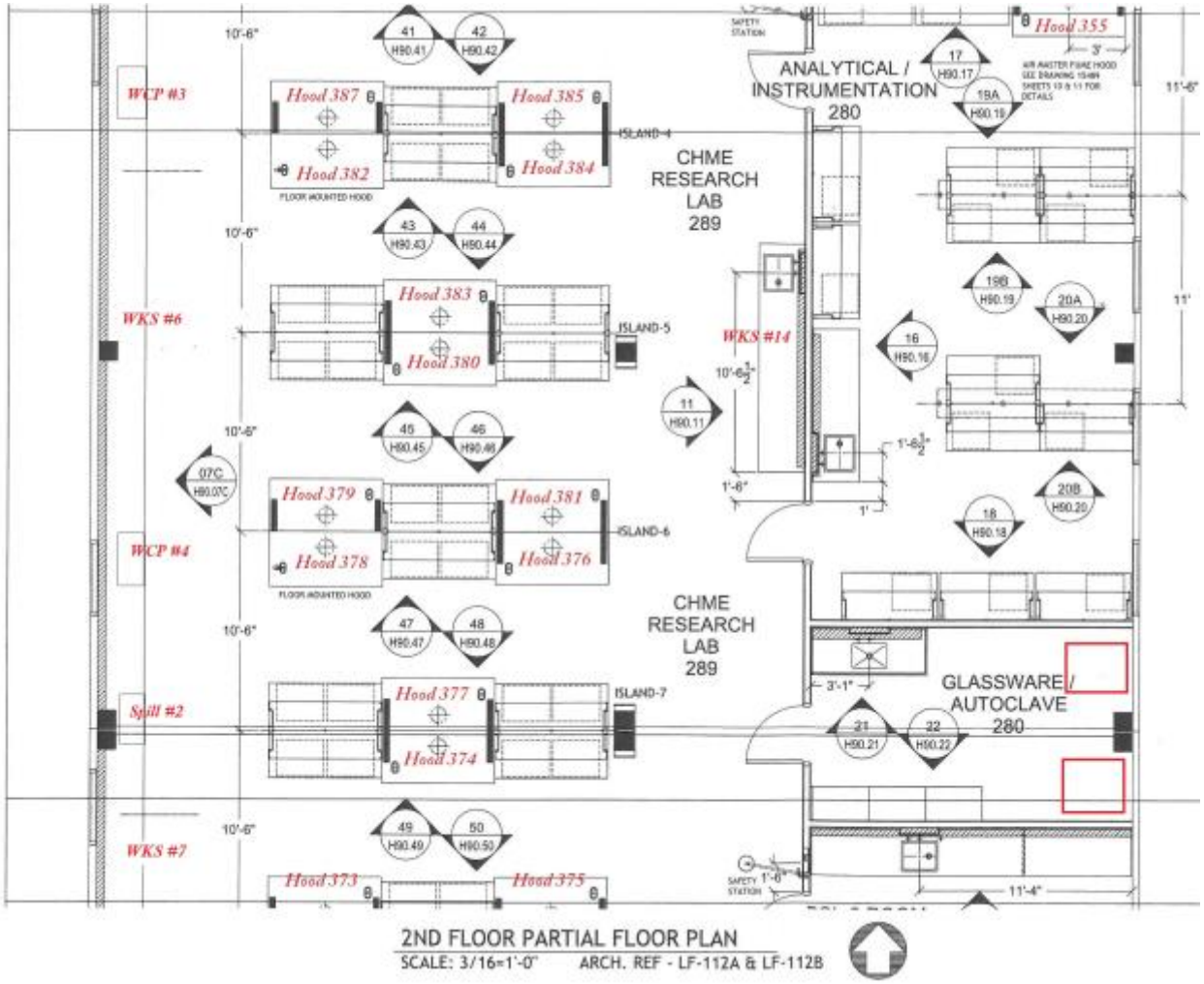
Date		
Researcher Name		
Principal Investigator Name		
Item	Description	Complete (Y/N)
Hood Assignment	Hood Number #_____	
Bench Top Assignment	Bench Area #_____	
ESP Update Submitted	ESP #'s _____/_____ _____	
Name Tag Label(s)		
Drawer Label(s)		
Shelf Label(s)		
Refrigerator/Freezer Label(s)		
Hazardous Waste Collection Points Identified?		
Hazardous Waste Containers Available?		
Chemicals Inventory in Quartzy		
Chemicals Inventory Posted		
Fume Hood Training Complete		

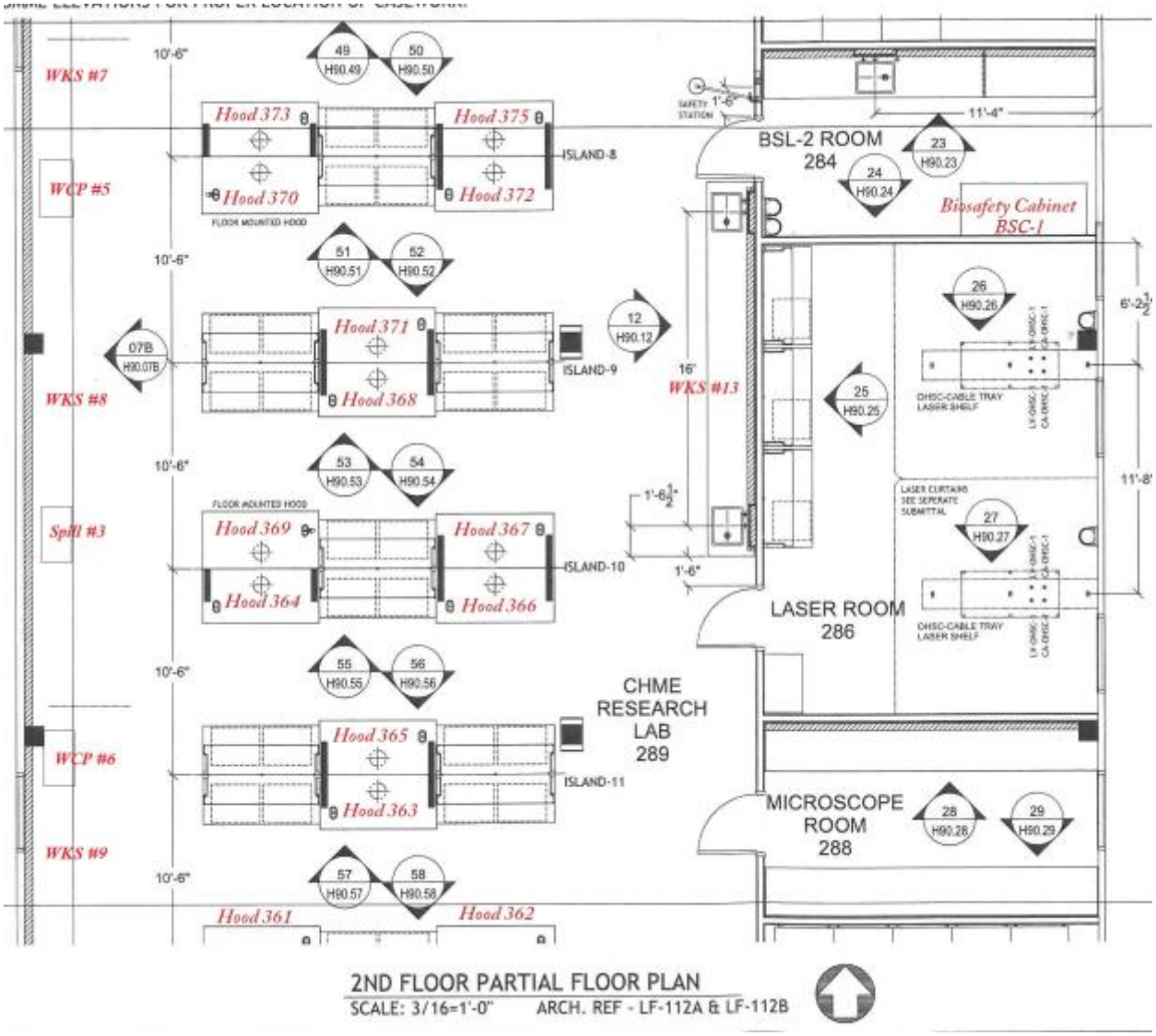
See COE-SOP-0002, "Researcher Lab Commissioning Requirements" for more details and examples.

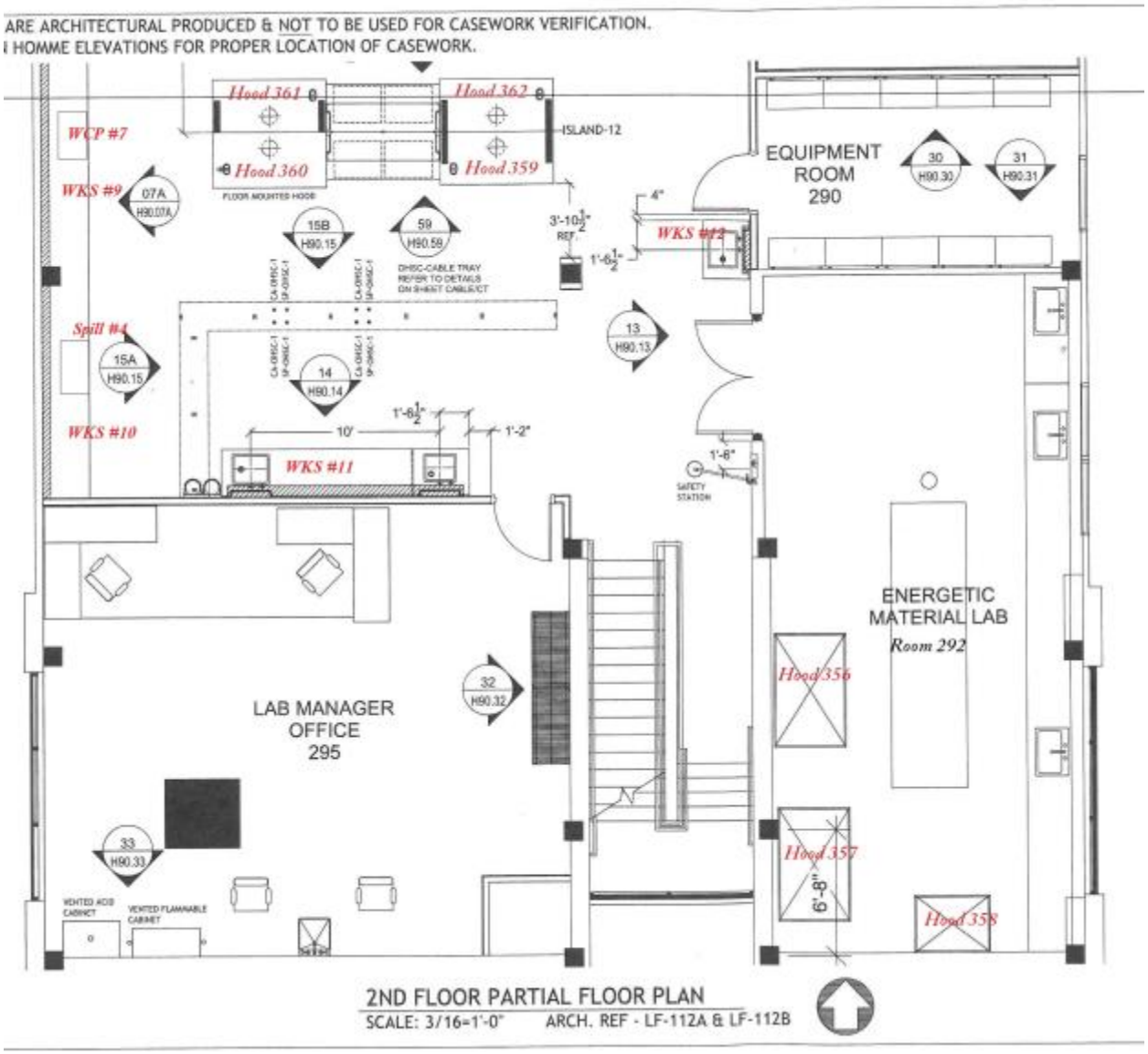
Appendix B - Jett Hall Laboratory Maps



2ND FLOOR PARTIAL FLOOR PLAN
SCALE: 3/16=1'-0" ARCH. REF - LF-112A & LF-112B


WCP #3
WKS #6
WCP #4
Spill #2
WKS #7
Hood 387
Hood 385
Hood 382
Hood 384
Hood 383
Hood 380
Hood 379
Hood 381
Hood 378
Hood 376
Hood 377
Hood 374
Hood 373
Hood 375
Hood 355
ISLAND-4
ISLAND-5
ISLAND-6
ISLAND-7
CHME RESEARCH LAB 289
CHME RESEARCH LAB 289
ANALYTICAL / INSTRUMENTATION 280
GLASSWARE / AUTOCLAVE 280
WKS #14
2ND FLOOR PARTIAL FLOOR PLAN
SCALE: 3/16=1'-0" ARCH. REF - LF-112A & LF-112B


WKS #7
WCP #5
WKS #8
Spill #3
WCP #6
WKS #9
Hood 373
Hood 375
Hood 370
Hood 372
Hood 371
Hood 368
Hood 369
Hood 367
Hood 364
Hood 366
Hood 365
Hood 363
Hood 361
Hood 362
ISLAND-8
ISLAND-9
ISLAND-10
ISLAND-11
BSL-2 ROOM 284
Biosafety Cabinet BSC-1
WKS #13
LASER ROOM 286
CHME RESEARCH LAB 289
MICROSCOPE ROOM 288
2ND FLOOR PARTIAL FLOOR PLAN
SCALE: 3/16=1'-0" ARCH. REF - LF-112A & LF-112B


ARE ARCHITECTURAL PRODUCED & NOT TO BE USED FOR CASEWORK VERIFICATION.
HOMME ELEVATIONS FOR PROPER LOCATION OF CASEWORK.
Hood 361
Hood 362
Hood 360
Hood 359
ISLAND-12
WCP #7
WKS #9
07A H90.07A
15B H90.15
59 H90.59
EQUIPMENT ROOM 290
30 H90.30
31 H90.31
WKS #12
Spill #4
15A H90.15
14 H90.14
13 H90.13
WKS #10
WKS #11
10'
1'-2"
1'-8"
SAFETY STATION
ENERGETIC MATERIAL LAB
Room 292
Hood 356
LAB MANAGER OFFICE 295
32 H90.32
33 H90.33
Hood 357
6'-8"
Hood 358
2ND FLOOR PARTIAL FLOOR PLAN
SCALE: 3/16=1'-0" ARCH. REF - LF-112A & LF-112B

Appendix C - Chemical Segregation and Storage Chart

Midd Lab Safety

CHEMICAL SEGREGATION AND STORAGE CHART

CLASS OF CHEMICALS	RECOMMENDED STORAGE METHOD	CHEMICAL EXAMPLES	INCOMPATIBLES SEE SDS IN ALL CASES
Compressed Gases - Flammable	Store in a cool, dry area, away from oxidizing gases. Securely strap or chain cylinders to a wall or bench top.	Methane, Acetylene, Propane	Oxidizing and toxic compressed gases, oxidizing solids.
Compressed Gases - Oxidizing	Store in a cool, dry area, away from flammable gases and liquids. Securely strap or chain cylinders to a wall or bench top.	Oxygen, Chlorine, Bromine	Flammable gases.
Compressed Gases - Poisonous	Store in a cool, dry area, away from flammable gases and liquids. Securely strap or chain cylinders to a wall or bench top.	Carbon monoxide, Hydrogen sulfide	Flammable and/or oxidizing gases.
Corrosives – Acids INORGANIC	Store in a separate, lined/protected acid storage cabinet. **DO NOT store acids on metal shelves**	**Inorganic (mineral) acids** - Hydrochloric acid, Sulfuric acid, Chromic acid, Nitric acid. *Note: Nitric acid is a strong oxidizer and should be stored by itself. Separate nitric acid from other acids by storing it in a secondary container or a separate acid cabinet.*	Flammable liquids, flammable solids, bases, oxidizers. **Organic acids**
Corrosives – Acids ORGANIC	Store in a separate, lined/protected acid storage cabinet. **DO NOT store acids on metal shelves**	**Organic acids** - Acetic acid, Trichloroacetic acid, Lactic acid	Flammable liquids, flammable solids, bases, and oxidizers. **Inorganic acids**
Corrosives - Bases	Store in a separate storage cabinet.	Ammonium hydroxide, Potassium hydroxide, Sodium hydroxide	Flammable liquids, oxidizers, poisons acids.
Explosives	Store in a secure location away from all other chemicals. Do not store in an area where they can fall.	Ammonium Nitrate, Nitro Urea, Sodium azide, Trinitroaniline, Trinitroanisole, Trinitrobenzene, Trinitrophenol/Picric acid, Trinitrotoluene (TNT).	All other chemicals.
Flammable Liquids	Store in a flammable storage cabinet. *Note: Peroxide forming chemicals must be dated upon opening, e.g., ether, tetrahydrofuran, dioxane*	Acetone, Benzene, Diethyl ether, Methanol, Ethanol, Hexanes, Toluene	Acids, bases, oxidizers poisons.
Flammable Solids	Store in a separate dry cool area away from oxidizers, corrosives.	Phosphorus, Carbon, Charcoal	Acids, bases, oxidizers, and poisons.
Water Reactive Chemicals	Store in a dry, cool location. Protect from water and the fire sprinkler system, if applicable. Label location - WATER REACTIVE CHEMICALS-	Sodium metal, Potassium metal, Lithium metal, Lithium Aluminium hydride	Separate from all aqueous solutions, oxidizers.
Oxidizers	Store in a spill tray inside a non-combustible cabinet, separate from flammable and combustible materials.	Sodium hypochlorite, Benzoyl peroxide, Potassium permanganate, Potassium chlorate, Potassium dichromate. *Note: The following chemical groups are considered oxidizers: Nitrates, Nitrites, Chromates, Dichromates, Chlorites, Hypochlorites, Chlorates, Perchlorates, Permanganates, Iodates, Persulfates, Peroxides, Picrates, Bromates, Superoxides.*	Separate from reducing agents, flammables, combustibles, organic materials.
Poisons/Toxic	Store separately in a vented, cool, dry, area in chemically resistant secondary containers.	Cyanides, heavy metal compounds, i.e. Cadmium, Mercury, Osmium	Flammable liquids, acids, bases, oxidizers.
General Chemicals Non-Reactive	Store on general laboratory benches or shelving. Use upper shelving for non-hazardous chemicals only.	Agar, Sodium chloride, Sodium bicarbonate, and most non-reactive salts	See MSDS

May 2016

Middlebury *Sciences Environmental Health & Safety* *go/labsafety*

Appendix D - References:

1. Standard Operating Procedure –#COE-SOP-0001, “Chemical Fume Hood Operation”
2. NMSU COE Chemical Hygiene Plan