

ANNUAL REPORT FISCAL YEAR 2021-2022



CLEMSON®

OCCUPATIONAL AND ENVIRONMENTAL SAFETY

Executive Director

Occupational and Environmental Safety (OES) had another productive year supporting Clemson's mission in 2021-2022. Our scope encompasses the Clemson enterprise statewide for research, service and teaching. Our staff are committed to exceptional customer service and continuous improvement. OES is grateful for the commitment and support of Tony Wagner and our safety partners in Finance and Operations. We look forward to a successful 2022-2023!

2021-2022 Highlights

Administration

- Completed a successful audit on OES accounting and transactions from Internal Audit. No major findings
- Successful financial management of OES 2021-2022 budget and accounting

Environmental Compliance

- Completed Environmental Compliance Gap review and addressed gaps
- Updated the SPCC compliance plan for main campus and all applicable off main campus Clemson facilities
- Transferred program management of Universal Waste (lamps, batteries, ballasts, etc.) from Facilities to OES
- Inspected by SCDHEC for main campus Hazardous Waste program. No violations noted for OES managed program and minor violations found in campus labs
- Establishing a Small Scale Hazardous remediation response team within OES to provide better and timely cleanup service rather than call in a contractor for simple cleanups. Will track responses and costs.

Research Safety

- Supported research review and safety protocols for new research at CUICAR – 3D Metal Printing for Dr. Liu and Dr. Pilla
- Supported Green Tiger initiative with UFacilities by lab banding 12 research facilities
- Participant on the new Advanced Materials facility and Lehotsky project teams. Implemented POSHER forms and process with faculty

Occupational Safety and Health

- Conducted 74 Indoor Air Quality reviews across campus and in Housing and Dining
- Established an Ergonomics program and service
- Successful support for purchasing BioRAFT (now SciShield) modules for Occupational Health and Medical Surveillance program.
- Significant program support and program improvement at CUICAR
- Significant safety culture change and program improvement at the EIC at CURI. Established excellent relationship and partnership with the new EIC Director.
- Had 2 OSHA Reportable incidents due to injuries resulting in hospitalization. No OSHA violations found

**DID YOU
KNOW?**

330 LAB SAFETY INSPECTIONS

Top findings:

- Lab Member list/required training not up to date
- Waste management issues identified
- Emergency contact and hazard info on door sign not up to date

TRAINING

- 62,110 records
- 94% of all safety training is taken online
- 7,913 online trained in 2022 (\$2.26/person)
- 4,769 online trained in hazardous waste

RADIATION SAFETY

- 17 active projects involving radioactive materials
- 60 Lasers either Class 3b or 4
- 53 X-ray producing devices

INDUSTRIAL HYGIENE AND SAFETY

- 352 Respirator Fit Tests
- 117 3D printers (29 advanced or industrial)
- 74 Indoor Air Quality Reviews
- 72 Department Safety Coordinators (40 Research/teaching and 32 Facilities)

HAZARDOUS WASTE

Removed:

- 6,660 chemical waste items
- 1,598 infectious waste bins
- 652 non-infectious waste bins

Managed on Main Campus (pounds)

- 39,010 RCRA
- 44,550 Infectious
- 11,673 Universal

CURI

Lasch Lab and Energy Innovation Center

- Lasch Lab 100% training compliance
- 19 EIC-Electrical Safety Task Analysis
- 23 EIC-Safety Task Analysis
- 61 EIC-Contractor Safety Pre-Work Checklists



Combined Program Highlights and Metrics

Training (Live and Online)


	1st	2nd	3rd	4th	Total	Comments
Biosafety						
Live Sessions	13	6	8	8	35	
Live Session Participants	109	36	139	42	326	
Online Participants	378	297	684	237	1596	
Chemical and Lab safety						
Live Sessions	7	3	4	4	18	
Live Session Participants	65	10	14	20	109	
Online Participants	364	69	264	146	843	
Environmental Compliance						
Live Sessions	4	1	4	1	10	
Live Session Participants	61	1	17	1	80	
Online Participants	2135	149	2177	308	4769	
Industrial Hygiene						
Live Sessions	5	1	2	1	9	
Live Session Participants	12	8	18	4	42	
Online Participants	557	286	908	780	2531	
Low Country Safety						
Live Sessions	40	27	31	38	136	
Live Session Participants					0	
Online Participants					0	
Occupational Safety						
Live Sessions	6	3	9	3	21	
Live Session Participants	45	15	67	13	140	
Online Participants	356	0	0	0	356	
Radioactive Material, X-Ray and Laser Safety						
Live Sessions	2	1	1	0	4	
Live Session Participants	22	4	11	0	37	
Online Participants	24	27	28	24	103	

Inspections

	1st	2nd	3rd	4th	Total	Comments
Inspections, Audits and Lab Visits						
Laboratory	96	76	64	62	298	
Non-lab	10	12	13	15	50	
Occupational Safety	13	10	13	30	66	
Radiation safety	7	9	12	15	43	
Hazardous Waste	0	0	0	0	0	
IBC Review	0	5	1	2	8	

Incident Response

	1st	2nd	3rd	4th	Total	Comments
Response to Incidents, Injuries and Near Misses						
Biosafety	3	3	3	1	10	
Chemical and Lab Safety	6	4	7	3	20	
Industrial Hygiene	1	0	0	0	1	
Occupational Safety	9	2	2	1	14	
Low Country Safety	1	0	2	0	3	
Radiation safety	0	0	1	0	1	



Individual Program Highlights and Metrics

Biosafety**Biosafety program in numbers:**

	1st	2nd	3rd	4th	Total	Comments
Inspections						
General Lab Safety	57	34	21	33	145	
IBC review	0	5	1	2	8	trip to the RECs
2-nd visits	2	5	5	5	17	
Other (lab visits)	2	49	36	62	149	PPE inspections
Incident Response						
Spills	1	0	0	0	1	
Exposure	1	1	1	0	3	eye splash, rabies
Injury	0	0	1	1	2	microtime, vibrotome incid's
Needle sticks	1	2	0	0	3	
Breach of containment	0	0	1	0	1	greenhouse
Administrative Review						
IBC	13	11	14	8	46	
IACUC	18	11	23	34	86	
Training						
Biosafety & Biohazard Waste online	350	71	213	113	747	
BBP Live Sessions	10	6	8	7	31	
BBP Live Session Participants	109	36	139	42	326	
BBP Refresher (online)	28	226	471	124	849	both for lab and non-lab
Other Live Sessions	3	0	0	1	4	

Chemical and Laboratory Safety

Chemical and Laboratory Safety program in numbers:

	1st	2nd	3rd	4th	Total	Comments
Inspections						
Laboratory inspections	37	37	38	24	136	
Other	0	0	0	0	0	
Fume Hoods						
Annual testing / calibration	365	67	16	63	511	
Laboratory evaluations						
Lab compliance assessments	15	10	12	10	47	
Consultations						
Lab renovation and design	3	12	4	9	28	
Safety and compliance	18	13	17	33	81	
Other	0	0	0	0	0	
Incidents						
Reported and investigated	6	4	7	3	20	
Training and Presentations						
Live Training Sessions	7	3	4	3	17	
Live Presentations	0	0	0	1	1	
Live Session Participants	65	10	14	20	109	
Online Participants	364	69	264	146	843	

Asbestos**Asbestos program in numbers:**

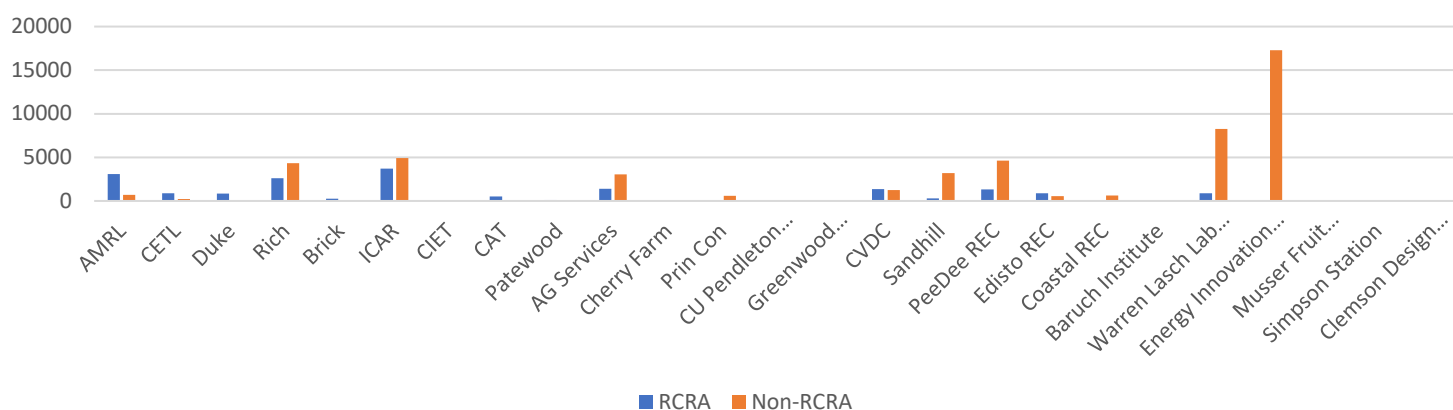
	1st	2nd	3rd	4th	Total	Comments
Requests reviewed						
New asbestos materials testing	40	32	92	63	227	
New asbestos air sampling	4	6	6	8	24	
New asbestos abatement	13	17	0	0	30	
New Lead Based Paint testing	22	15	35	15	87	
Other HazMat materials testing	0	3	6	3	12	
Reports reviewed						
Asbestos materials testing	40	32	92	63	227	
Asbestos Air Sampling	4	6	6	8	24	
LBP materials testing	22	15	35	17	89	
Other HazMat materials testing	0	3	6	3	12	
Asbestos						
ACM and Hazmat testing & reports	44	56	133	133	366	
Abatements (non-project related)	0	0	2	22	24	
Asbestos abatements completed	13	17	0	22	52	
Abatement Projects (Total)	13	22	0	5	40	
NESHAP	4	3	0	14	21	
Small	7	12	0	3	22	
Minor	2	7	0	11	20	
O&M*	0	0	0	2	2	
Asbestos waste (total cubic yards)	61	191	0	407	659	
Asbestos abatement audits	13	17	0	22	52	Post abatement inspections
Air sampling reports reviewed	4	3	6	8	21	
Lead Abatement and other Hazardous Materials Testing						
LBP testing and reports	22	15	35	35	107	
Lead abatement projects	0	0	0	0	0	
Other Haz Material test reports	0	3	6	6	15	

Environmental Compliance

Environmental Compliance program in numbers:

	1st	2nd	3rd	4th	Total	Comments
Manifests Shipped and Tracked						
Hazardous Waste	30	33	18	17	98	
Non-Hazardous Waste	4	3	7	2	16	
Biohazard Waste	6	18	18	14	56	
Waste Managed in Pounds – Main Campus						
RCRA	9,409	11,582	8,680	9,339	39,010	
Non-RCRA	6,607	4,321	11,320	8,646	30,894	
Industrial (Class III Landfill)	18,700	12,788	78,640	22,000	132,128	
PCB	67	0	3,801	456	4,324	
Universal	2,132	1,456	4,162	3,923	11,673	
Infectious	10,592	15,552	12,209	6,197	44,550	
Non-Infectious	5,063	5,669	4,519	6,721	21,972	
Waste Managed in Pounds – Satellite Areas						
RCRA	3,530	4,095	3,056	7,530	18,211	
Non-RCRA	2,931	27,639	5,782	12,874	49,226	

Waste Managed per Site, in pounds



Lab Inspections/Visits						
Lab Audit (SAA)	0	0	0	0	0	
Lab Clean-outs	0	2	5	2	9	
Lab Visits	424	175	405	304	1308	
Waste Items Removed						
Chemical	1359	1278	2711	1312	6660	
Infectious	369	538	453	238	1598	
Non-Infectious	164	187	160	181	692	
Training						
Hazardous Waste Live Sessions	1	0	3	0	4	
Hazardous Waste Live	25	0	16	0	41	
Hazardous Waste Online	2135	149	2177	308	4769	
Haz Mat Live Sessions	3	1	1	1	6	
Haz Mat Live Participants	36	1	1	1	39	
Haz Mat Online	0	0	0	0	0	
SPCC Inspections						
	0	0	0	0	0	

Industrial Hygiene

Industrial Hygiene program in numbers:

	1st	2nd	3rd	4th	Total	Comments
Inspections:						
Arts	0	0	0	0	0	
HAZCOM - General	0	0	0	0	0	
Shops	0	0	0	0	0	
Other Inspections	0	0	0	1	1	
Indoor Air Quality Investigations:						
Housing	2	35	15	1	53	
Long term IAQ Evaluations	1	0	0	0	1	
Off main campus	1	0	0	0	1	
Office	9	3	2	2	16	
Other	2	0	2	0	4	
Hazard Communication						
SDS reviews - general	3	18	27	34	82	
SDS reviews - COVID-19	28	16	7	2	53	
Assessments	12	57	12	30	111	
IBC/IACUCU Chemical reviews						
Chemicals reviewed	14	12	14	20	60	
SASPs completed	8	2	5	13	28	
SOPs completed	2	2	6	13	23	
Incident Response						
Spill	0	0	0	0	0	
Exposure	0	0	0	0	0	
Injury	0	0	0	0	0	
ObservNow and Nice Catch, Tiger!	1	0	0	0	1	
Training						
Respiratory Protection (online)	101	77	186	132	496	
Hazcom (online)	382	104	377	218	1081	
Other (list out)	74	105	345	430	954	
Live training sessions	5	1	2	1	9	
Live training participants	12	8	18	4	42	
IH Program:						
IH Monitoring	4	3	7	6	20	
IH Consulting - Assessments	4	5	4	7	20	
Equipment reviews	10	14	2	8	34	
Outreach Fact sheets	5	3	3	3	14	
Personal Protective Equipment						
Respirator Fit tests - General Use	176	15	87	74	352	
Respirator Fit tests - Covid	12	16	0	0	28	
N95 reviews - COVID	3	5	6	0	14	
Other PPE reviews	12	14	12	38	76	
Hearing Conservation						
Noise area survey assessments	3	4	9	5	21	
Potential Areas identified	2	1	2	1	6	
Noise dosimetry conducted	9	4	2	5	20	
Personnel in HCP	5	8	4	3	20	

Occupational Safety

Occupational Safety program in numbers:

	1st	2nd	3rd	4th	Total	Comments
Consulting (Faculty, Staff, Student, Special Event)						
	30	18	20	24	92	
Safety Walkthroughs/Inspections (New Space Pre-Inspect, Workspace, Confined, Construction and Utility)						
	10	7	11	30	58	
Formal Inspections (Facilities, Faculty and Student Shops)						
	3	3	2	0	8	
Building / Structure Construction (Consultation, Reviews, Planning)						
	3	1	4	11	19	
Machinery/ Equipment (Consultation, Reviews, Installation)						
	4	2	3	5	14	
Incident Response (Vehicle, Worker, Non-employee)						
	9	2	2	1	14	
Incident Review						
Employees	4	15	8	7	34	
Student	3	4	2	2	11	
Total	7	19	10	9	45	
Incident Investigation						
OSHA Reportable	0	0	2	1	3	
OSHA Recordable	5	16	6	4	31	
General Safety	4	3	0	3	10	
Live Physical Hazards Safety Training (Practical Exams, Shop Safety, OSHA, Live Fire Safety)						
Sessions	6	3	9	3	21	
Participants	45	15	67	13	140	
Online Safety Training (Physical Hazards and General Safety)						
	356	0	0	0	356	
Job Safety Analysis						
Best Safety Practice Review	2	3	4	5	14	
OSHA Written Programs (Create/Review/Revision/Implement)						
	3	1	1	1	6	
Non Recordable Incident Summary						
Near Miss: Safe Observation	1	1	0	0	2	from BioRAFT and JJ Keller
First Aid	2	2	6	4	14	
Other (Incident No first aid)	1	1	0	1	3	
Total	4	4	6	5	19	
Injury Summary OSHA Recordable Incidents						
No Days Away/Restrictions	7	0	18	13	38	
Resulting in Days Away	2	1	9	1	13	
Resulting in Days Restricted	16	6	12	6	40	
Resulting in Days Away & Restricted	6	0	4	2	12	
Total	31	7	43	22	103	
Injury Summary OSHA Reportables						
Serious Bodily Harm	0	0	0	0	0	
Hospitalization	0	0	2	0	2	
Fatalities	0	0	0	0	0	
Total	0	0	2	0	2	
COVID-19 Response						
Consults, Research, Reviews	7	0	0	0	7	

Radiation Safety

Radiation Safety program in numbers:

	1st	2nd	3rd	4th	Total	Comments
Program Administration						
RSC Meetings	1	1	1	1	4	
New Projects	0	1	1	2	4	
Inactivated Projects	0	1	0	0	1	
Terminated Projects	0	0	1	1	2	
Amendments (RSC)	0	3	2	1	6	
Amendments (RSO)	1	1	1	2	5	
Compliance Award Reviews	11	3	2	9	25	
Inspections						
RAM	7	7	8	9	31	
X-Ray	0	2	4	6	12	
Waste Pickups						
Dry Waste	6	12	16	5	39	
Liquid Waste	0	1	0	2	3	
Mixed Waste	4	3	5	2	14	
Waste Disposal						
Dry Waste	0	0	6	0	6	
Liquid Waste	0	0	0	3	3	
Mixed Waste	0	1	0	2	3	
Training						
New RAM Users Live Sessions	1	1	1	0	3	
Live Session Participants	6	4	11	0	21	
Refresher Live Sessions	1	0	0	0	1	
Live Session Participants	16	0	0	0	16	
Refresher (online)	8	12	19	3	42	
X-ray (online)	9	15	9	11	44	
Laser (online)	7	0	0	10	17	
Regulatory Visits						
DHEC RAM	0	0	0	0	0	
DHEC X-Ray	0	0	0	0	0	
Other						
Instruments Calibrated	11	6	23	4	44	
Surveys Performed	0	0	0	2	2	
Sealed Source: Leak Test	27	1	21	2	51	
Sealed Source: Inventories	15	6	23	3	47	
Dosimetry Exchanged	97	97	97	97	388	
Packages Received	6	11	3	2	22	
Incident Response	0	0	1	0	1	unmarked shipment
Lab Setup / Closeout	0	0	0	3	3	

Low Country Safety

CURI and Low Country program in numbers:

	1st	2nd	3rd	4th	Total	Comments
Training						
Various topics	5	4	7	6	22	
Collaboration	13	10	9	12	44	
Survey discussion	4	1	5	6	16	
Hazard Identification	6	5	4	5	20	
Lab safety discussions	2	5	2	2	11	
Ph.D. Grad student, Intern	10	2	4	7	23	
Inspections and Monitoring						
Hazard Identification	3	7	7	6	23	
Surveys	5	2	4	4	15	
Audits	2	3	2	4	11	
Consults	15	9	13	13	50	
Incidents / near misses	1	0	2	0	3	
Professional Development						
Self	1	0	0	0	1	
Others	0	0	0	0	0	



Institutional Safety Metrics

BioRAFT

	1st	2nd	3rd	4th	Total	Comments
lab Registration						
Number of labs registered	359	364	377	381	381	
Number o labs not registered	90	89	67	66	66	
Percentage of labs registered (%)	80.5	80.9	85.3	85.6	85.6	

Injury and Incident Summary

	1st	2nd	3rd	4th	Total	Comments
Non Recordable Incident Summary						
Near Miss	1	1	0	0	2	
First Aid	2	2	6	4	14	
Other (Incident No first aid)	1	1	0	1	3	
Total	4	4	6	5	19	
Injury Summary OSHA Recordable Incidents						
No Days Away or Restricted	7	0	18	13	38	
Resulting in Days Away	2	1	9	1	13	
Resulting in Days Restricted	16	6	12	6		
Resulting in Days Away & Restricted	6	0	4	2	12	
Total	31	7	43	22	103	
Injury Summary OSHA Reportables						
Serious Bodily Harm	0	0	0	0	0	
Hospitalization	0	0	2	0	2	
Fatalities	0	0	0	0	0	
Total	0	0	2	0	2	