INL/EXT-18-44401

Idaho National Laboratory Research Center Renewal Application for the Industrial Wastewater Acceptance Permit Number IF-8733-54171-1

January 2018

The INL is a U.S. Department of Energy National Laboratory
operated by Battelle Energy Alliance

INL/EXT-18-44401

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January 2018

Idaho National Laboratory
Idaho Falls, Idaho 83415

http://www.inl.gov

Prepared for the
U.S. Department of Energy
Under DOE Idaho Operations Office
Contract DE-AC07-05ID14517

INL/EXT-18-44401

IDAHO NATIONAL LABORATORY RESEARCH CENTER RENEWAL APPLICATION FOR THE INDUSTRIAL WASTEWATER ACCEPTANCE PERMIT NUMBER IF-8733-54171-1

CITY OF IDAHO FALLS
INDUSTRIAL USER FACT SHEET

Facility Name: Idaho National Laboratory Research Center (IRC, Buildings IF-601, IF-602. IF-603, IF-611, IF-627, IF-638, IF-655, IF-657, and IF-732)

Facility Address: 2351 North Boulevard

City: Idaho Falls State: ID Zip Code: 83402

Mailing Address: P.O. Box 1625

City: Idaho Falls State: ID Zip Code: 83415

Phone: 208-526-7740 Fax: 208-526-5848

Contact # 1: James Graham Title: BEA Staff

Email Address: James.Graham@inl.gov Cell Number: 208-680-5844

Contact # 2: Mike Lewis Title: BEA Staff

Email Address: Michael.Lewis@inl.gov Cell Number: 208-569-4924

Contact # 3: Joy Kibbee Title: BEA Staff

Email Address: Joy.Kibbee@inl.gov Cell Number: 208-589-4707

Type of Business: Government Research and Development

Products Manufactured: None

Operating Schedule: 7:00 AM-4:30 PM Monday through Thursday and 7:00 AM to 3:30 PM every other Friday

Number of Employees: Approximately 240

SIC Code: 8733 NAICS Code: 541715

Maximum Daily Flow: 30,000 gallons (estimated) Average Daily Flow: 30,000 gallons (estimated)

Building Modifications Planned: No building modifications are currently planned

CITY OF IDAHO FALLS

INDUSTRIAL PRETREATMENT DISCLOSURE FORM

COMPLETE ALL APPLICABLE SECTIONS. INFORMATION MUST BE TYPED OR CLEARLY PRINTED. ATTACH INFORMATION AS NEEDED. SIGNING OFFICIAL MUST HAVE AUTHORIZATION TO PROVIDE SUCH INFORMATION ON BEHALF OF THE COMPANY.

1. Company Name: Battelle Energy Alliance, LLC; Idaho National Laboratory (INL)
(Please print or type)

2. Division Name (if applicable): Idaho National Laboratory Research Center (IRC, Buildings IF-601, IF-602, IF-603, IF-611, IF-627, IF-638, IF-655, IF-657, and IF-732)

3. Mailing Address: a. Street or PO Box: P.O. Box 1625

b. City, State & Zip Code: Idaho Falls, ID 83402

4. Facility Address: a. Street or PO Box: 2351 North Boulevard

b. City, State & Zip Code: Idaho Falls, ID 83402

5. Type of Business: Government Research and Development

6. Final Product Manufactured: No products are manufactured

7. SIC: 8733 NAICS: 541715
((Standard Industrial Classification) (North American Industry Classification System)

8. **Wastewater Constituents:**

Parameter	Concentration (MG/L)
Arsenic	<0.04
Cadmium	<0.26
Chromium	<2.77
Copper	<1.93
Cyanide	<1.04
Lead	<0.29
Mercury	<0.002
Nickel	<2.38
Oil and Grease (petroleum or mineral oil)	<100
Oil and Grease (animal and vegetable)	<250
Silver	<0.43
Zinc	<0.90
pH	Not <5.0 and not >9.0

9. **Wastewater Average Daily Discharge Flow:**

Process: 23,000 gallons (estimated) **Sanitary:** 4,600 gallons (estimated)

Cooling: 2,400 gallons (estimated) **Total:** 30,000 gallons (estimated)

a. Daily, Monthly, Seasonal Variation: Steady

b. Time and Duration of Discharge: Continuous

10. Discharge to wastewater system: Attach as Exhibit "A" a plan to the property showing accurately the site plan, floor plan, sewers, sewer connections, inspections manholes, and sampling chambers by size, location. **See Exhibit A.**

11. Description of facility: Attach as Exhibit "B" a description of the activities, facilities and plant processes, including all materials discharged to the sewers or treatment facilities. **See Exhibit B.**

12. Prohibited pollutants being discharged as regulated by City Sewer Use Ordinance.

	CONCENTRATION (MG/L)	
*POLLUTANT	DAILY MAXIMUM	DAILY AVERAGE
None		

* Chemical Classification:

Flammable Explosive Corrosive Reactive
Noxious/Fuming Toxic Radioactive Inhibitory to POTW

13. Is Industry in compliance with City Industrial Pretreatment Ordinance? X (Yes) _____(No).

14. Is additional pretreatment required? _____(Yes) X (No).

If yes, describe pretreatment necessary

15. Compliance Schedule: (Must conform to requirements of City Pretreatment Ordinance). Attach Additional sheets as necessary.

Not Applicable

16. Products produced: (Attach additional sheets as necessary).

TYPE	AMOUNT AND RATE OF PRODUCTION	PROCESS
____	IRC facilities are used for research. No products	_____
____	are produced.	_____

17. Raw materials used, to include chemicals used in process that could be discharged to sanitary System: (Attach additional sheets as necessary). **See Exhibit C.**

AMOUNT UTILIZED

TYPE	AVERAGE/DAY	MAXIMUM/DAY
_____	_____	_____
_____	_____	_____

18. **Environmental control permits:** List any environmental control permits held by or for your facility.

Injection well permit #25-W-062-001 for the IRC closed loop cooling system.

Industrial Wastewater Acceptance Permit No. IF-8733-54171-1

Telephone: (208) 526-9738 **Date:** 1/24/13

Owner/Manager: David B. Lively
(Please print or type)

Organization /Title: Research and Education Campus, Facility and Site Services/Facilities Operations and Maintenance Manager

Address: P.O. Box 1625, MS 2206

City: Idaho Falls **State:** ID **Zip Code:** 83415

Email: David.Lively@inl.gov

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 fine and imprisonment for knowing violations.

Signature: 

ACCIDENTAL SPILL PREVENTION PLAN

Facility Name: INL Research Center (Buildings IF-601, IF-602, IF-603, IF-611, IF-627, IF-638, IF-655, IF-657, IF-732)
Facility Address: 2351 North Boulevard

City: Idaho Falls State: ID Zip Code: 83402

Mailing Address: P.O. Box 1625, Mail Stop 3406

City: Idaho Falls State: ID Zip Code: 83415

Phone: 208-526-7740 Fax: 208-526-5848

Contact # 1: James Graham Title: BEA Staff

Email: James.Graham@inl.gov

Contact # 2: Mike Lewis Title: BEA Staff

Email: Michael.Lewis@inl.gov Phone: 208-526-0623 Fax: 208-526-3149

Type of Business: Government Research and Development

Products Manufactured: None

Operating Schedule: 7:00 AM-4:30 PM Monday –Thursday and 7:00 AM -3:30 PM every other Friday

Number of Employees: 240

SIC Code: 8733 NAICS Code: 541715

1. Facility Layout and Flow Diagram: Attach copy addressing facility layout, entrance and exits, chemical storage areas, manufacturing area and floor drains, floor sumps and oil and sand interceptors. **See Exhibits A and B.**

2. Chemical Data: List chemical names, maximum volume, chemical storage location, disposal method and documentation of disposal, copies of the Material Safety Data Sheets. **See Exhibit C. Material Safety Data Sheets are available on request.**

3. Spill and leak prevention equipment: See Exhibit D

4. Emergency Response and procedures: Attach copy of procedures. **See Exhibit D**

5. Spill Reporting: Attach list and documentation that employees have been trained on what to do in the event of an accidental spill. Who and when to contact, list of each agency and phone numbers that employees would use in case of an emergency. **See Exhibit D**

Exhibit A

Idaho National Laboratory Research Center (IRC) Site Plan, Underground Utilities Drawing, and Facility Floor Plans

Figure A-1. Site plan showing location of IRC permitted buildings.

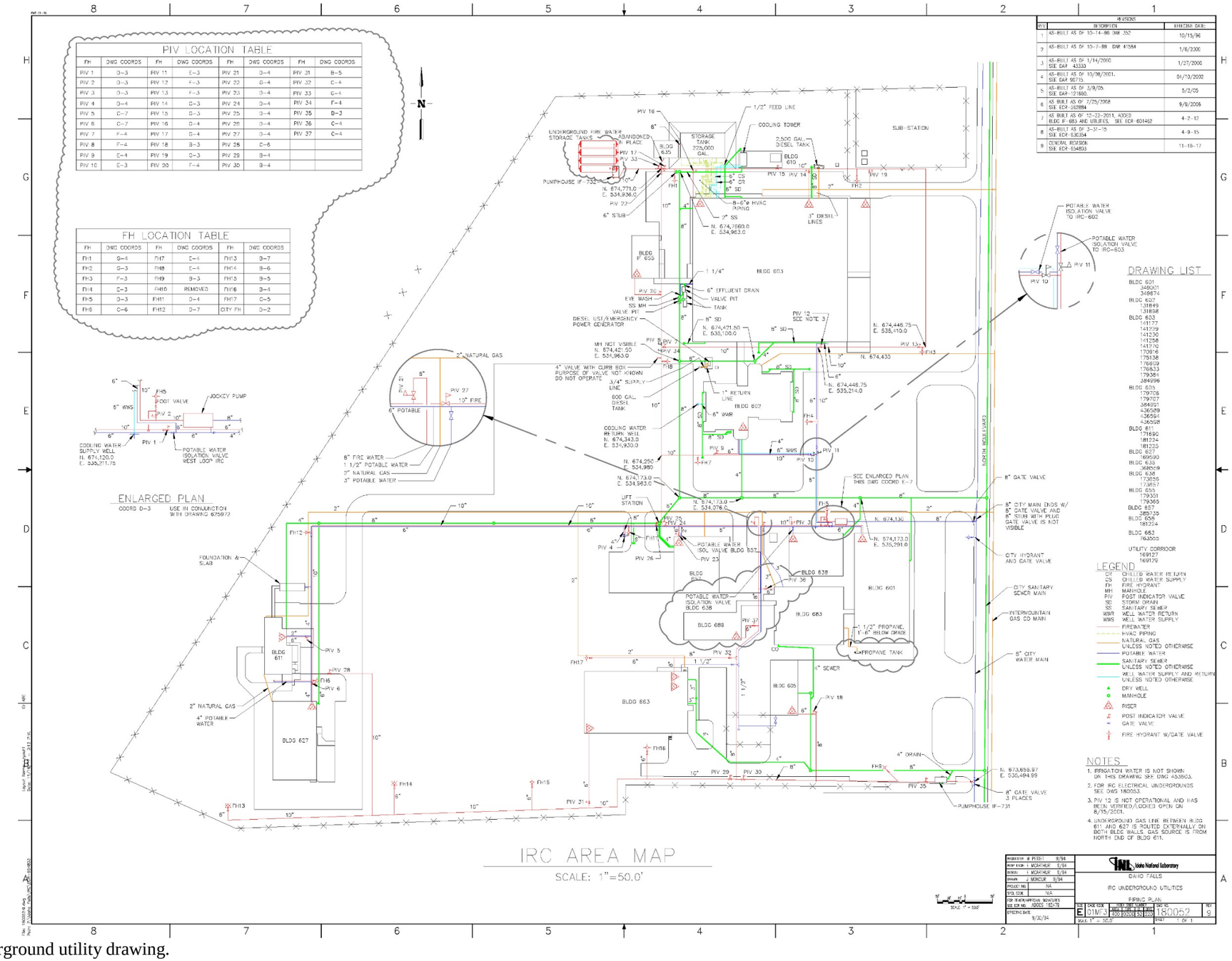

Figure A-2. IRC underground utility drawing.

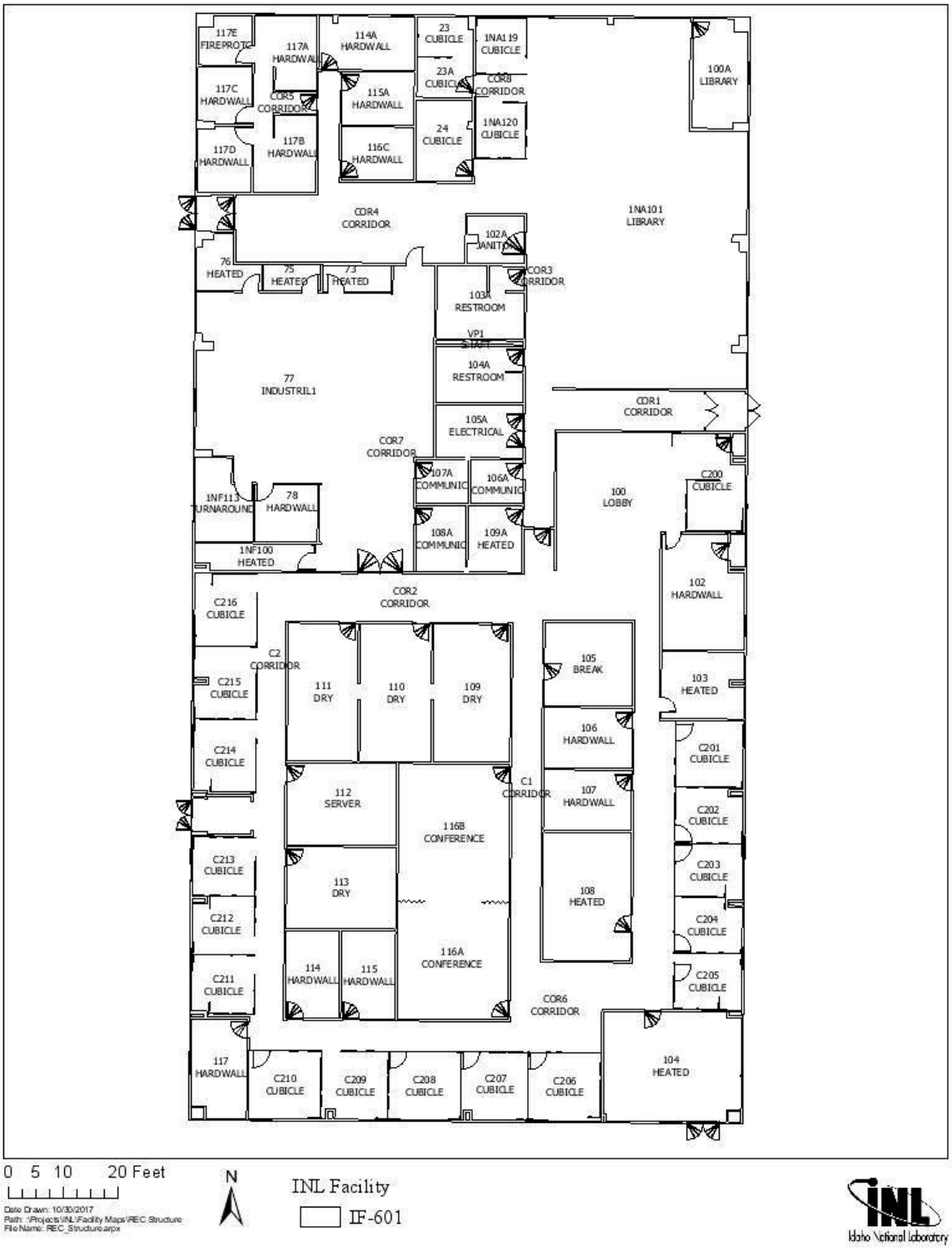

Figure A-3. IRC Radiological and Environmental Sciences Office (IF-601) floor plan.

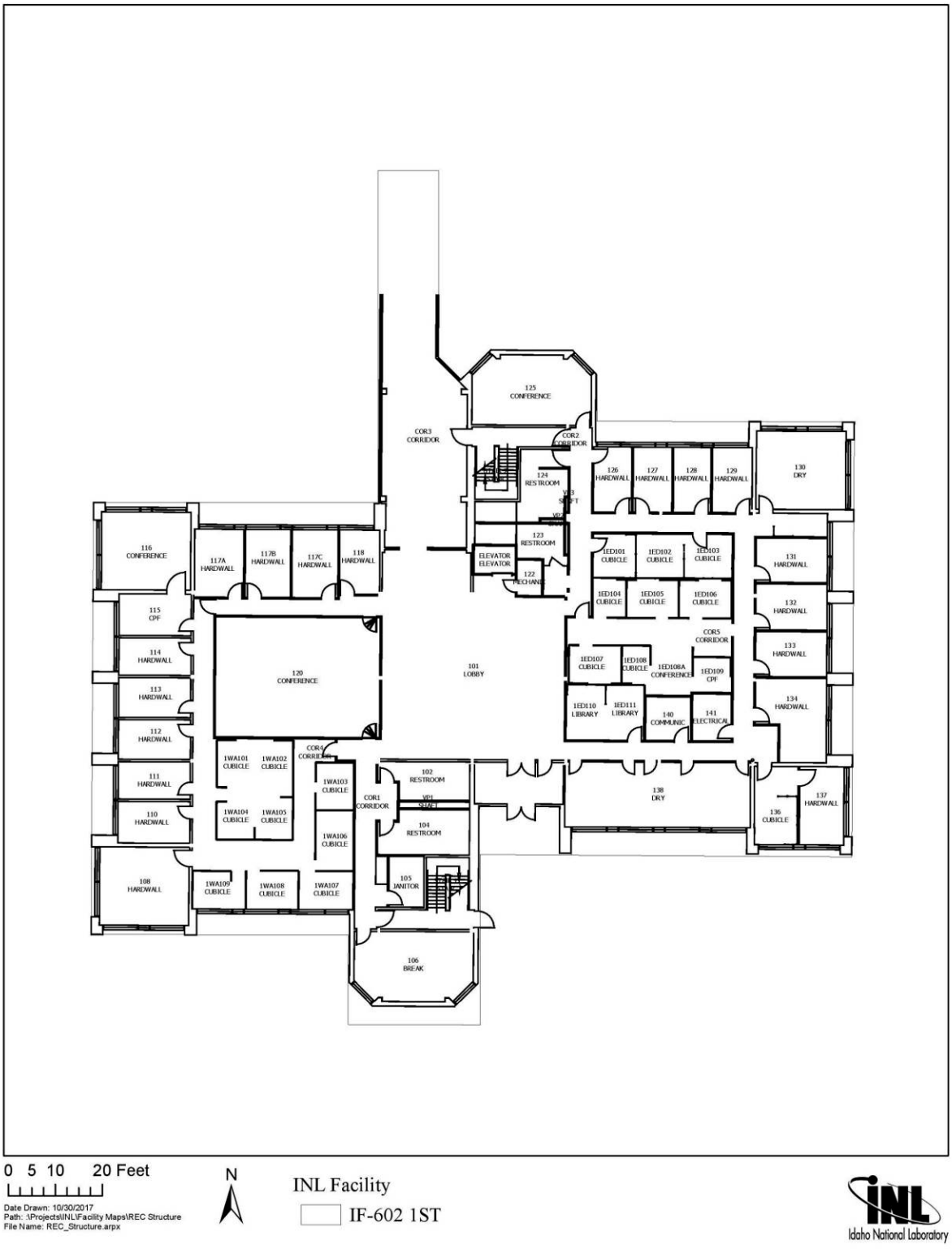

Figure A-4. IRC Office Building (IF-602) floor plan (1st floor).

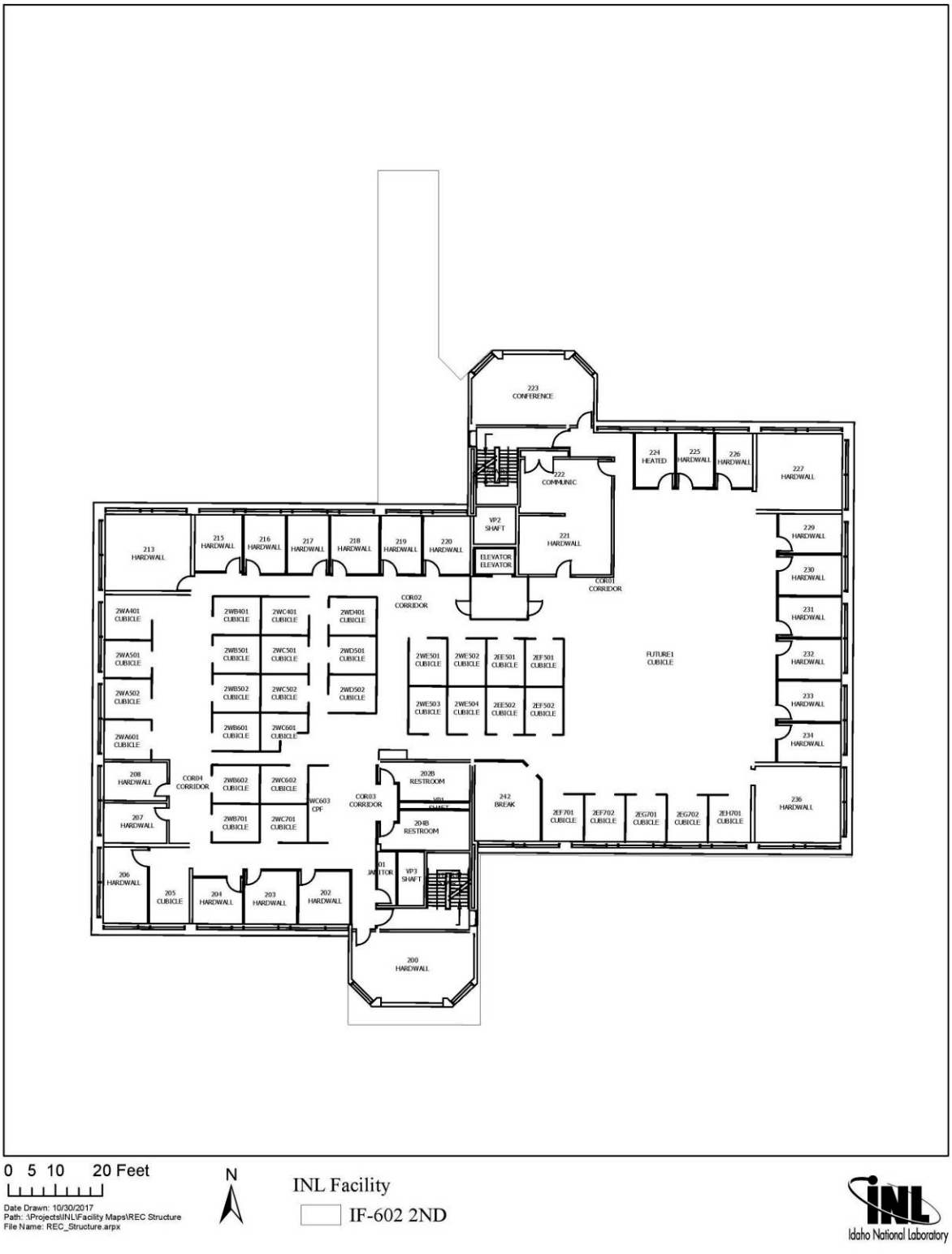

Figure A-5 IRC Office Building (IF-602) floor plan (2nd floor).

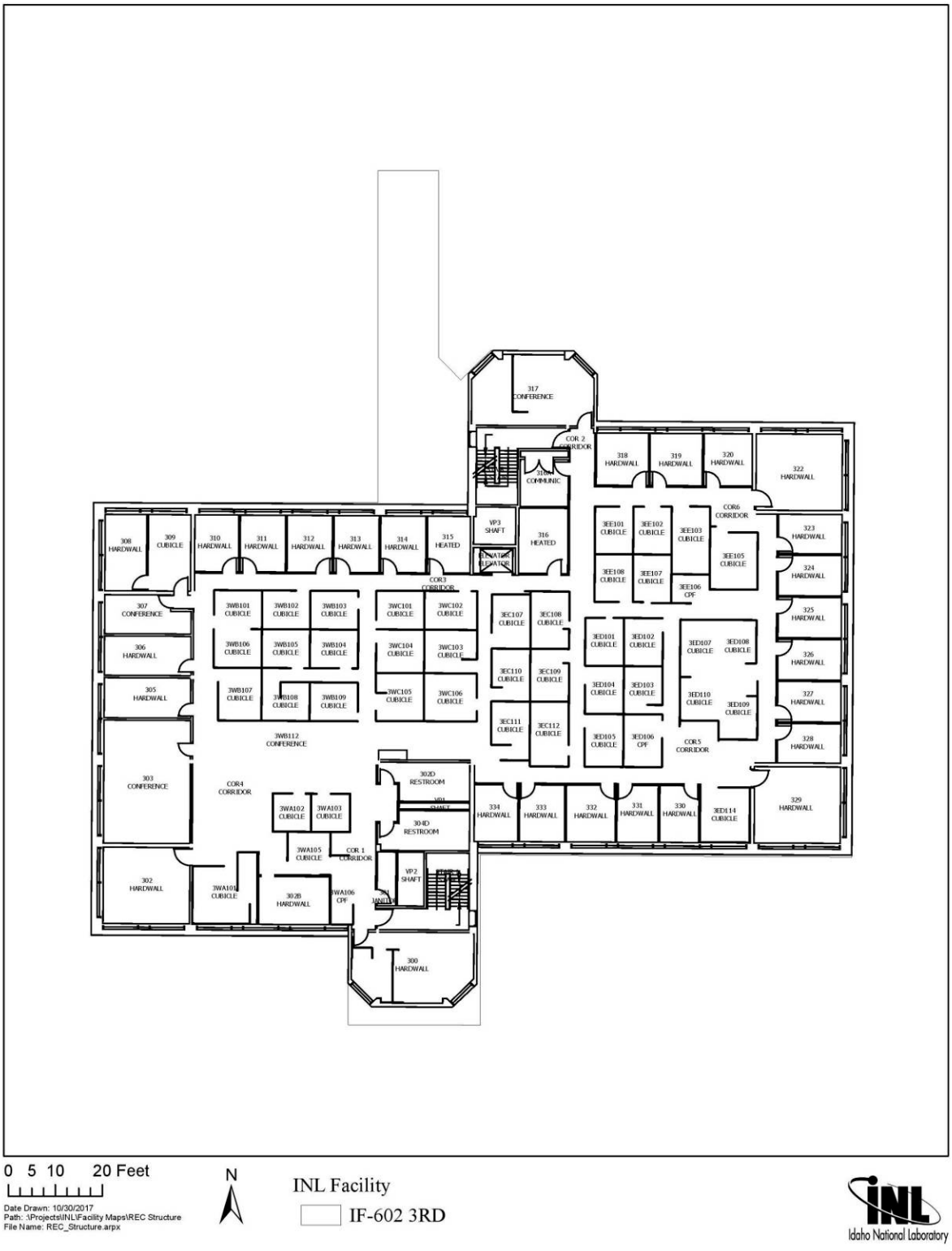

Figure A-6. IRC Office Building (IF-602) floor plan (third floor).

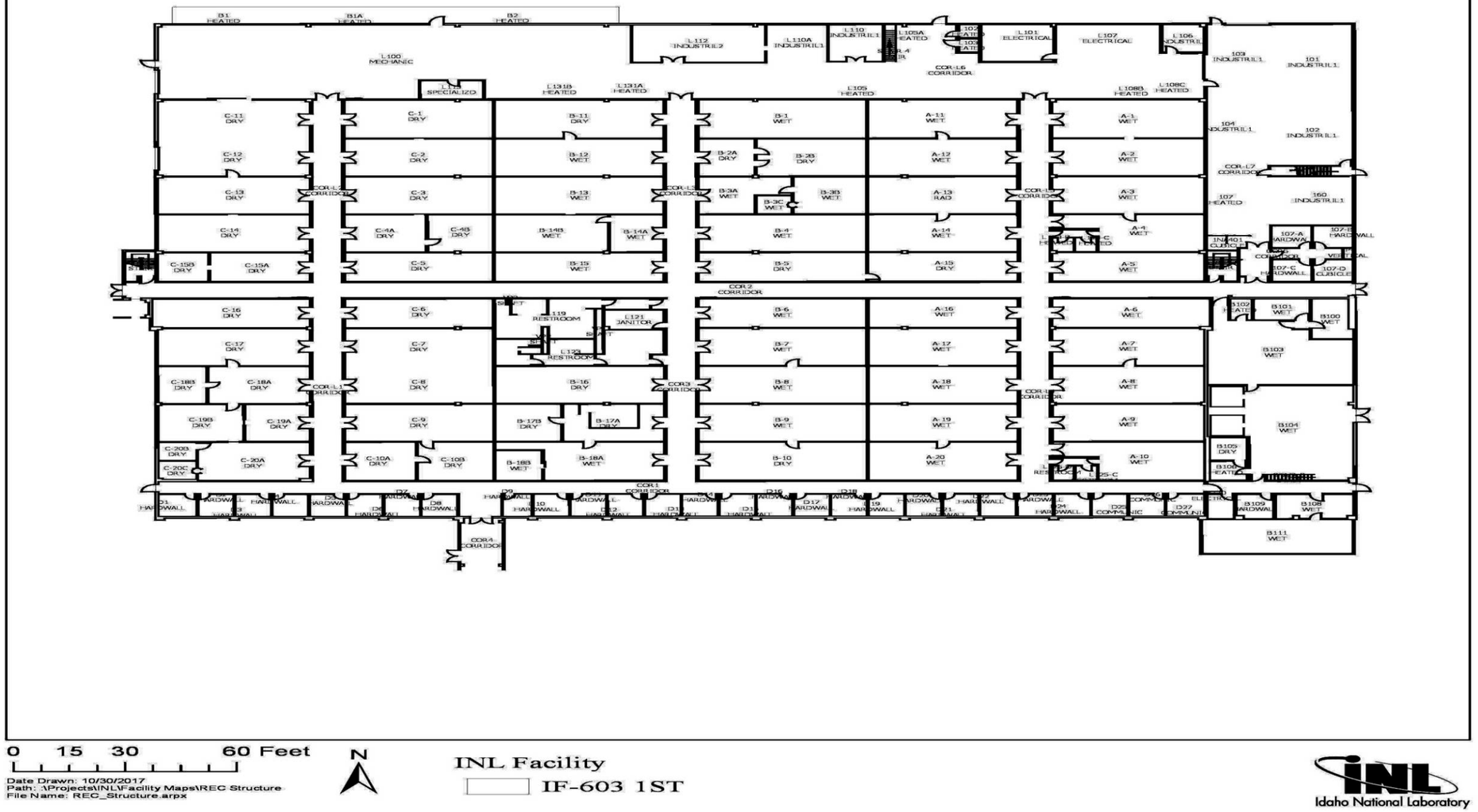

Figure A-7 IRC Laboratory Building (IF-603) floor plan (1st floor).

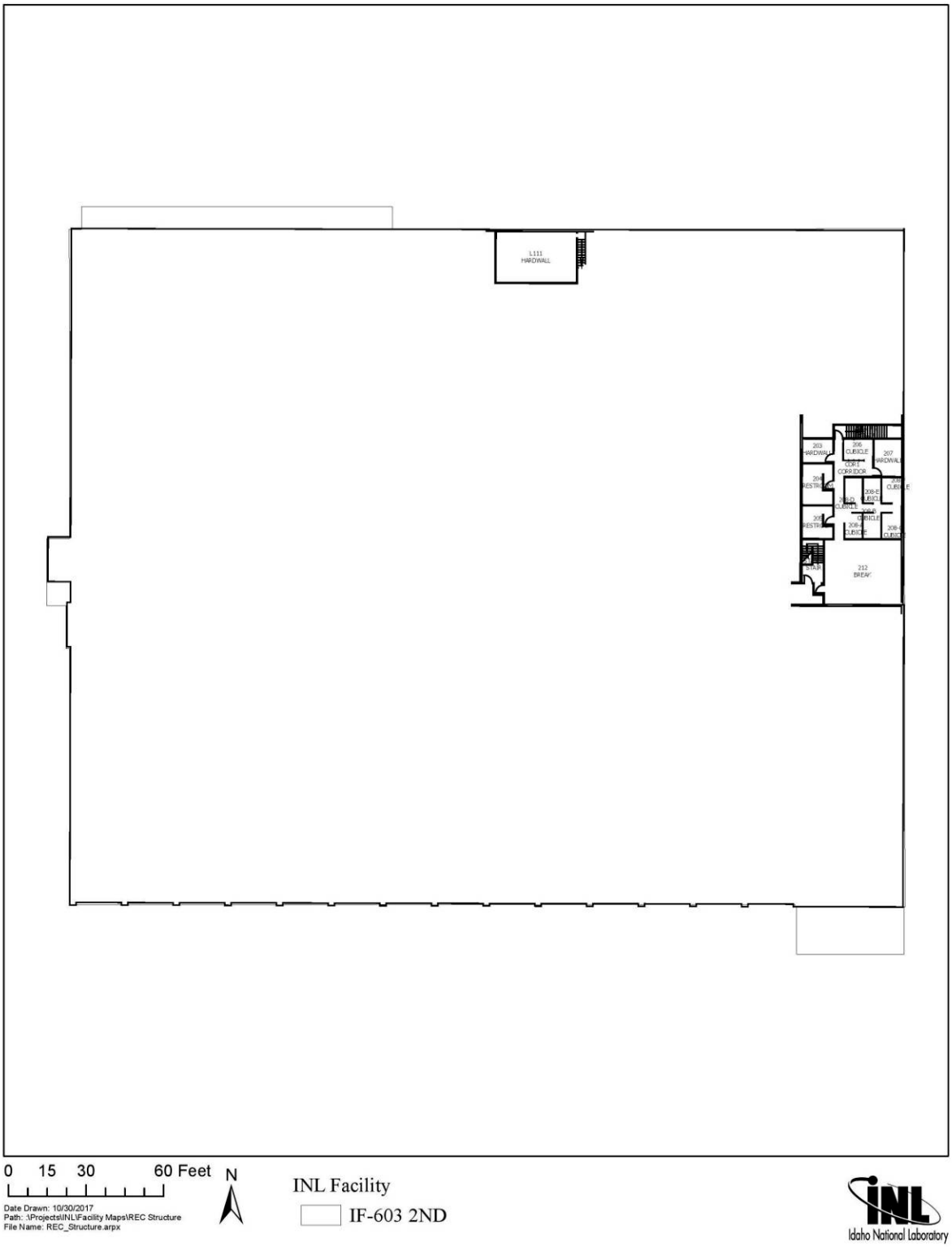

Figure A-8. IRC Laboratory Building (IF-603) floor plan (2nd floor).

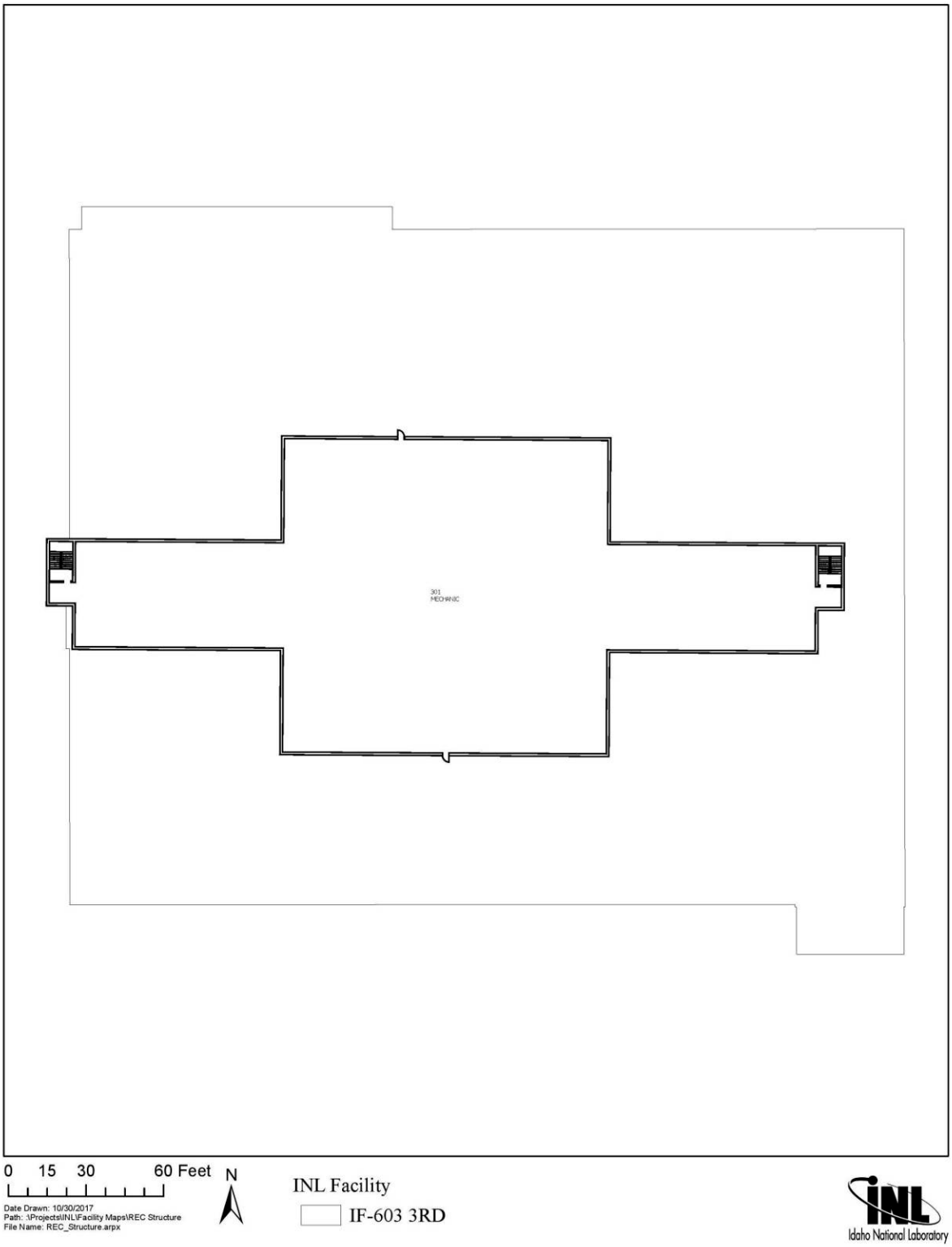

Figure A-9. IRC Laboratory Building (IF-603) floor plan (3rd floor).

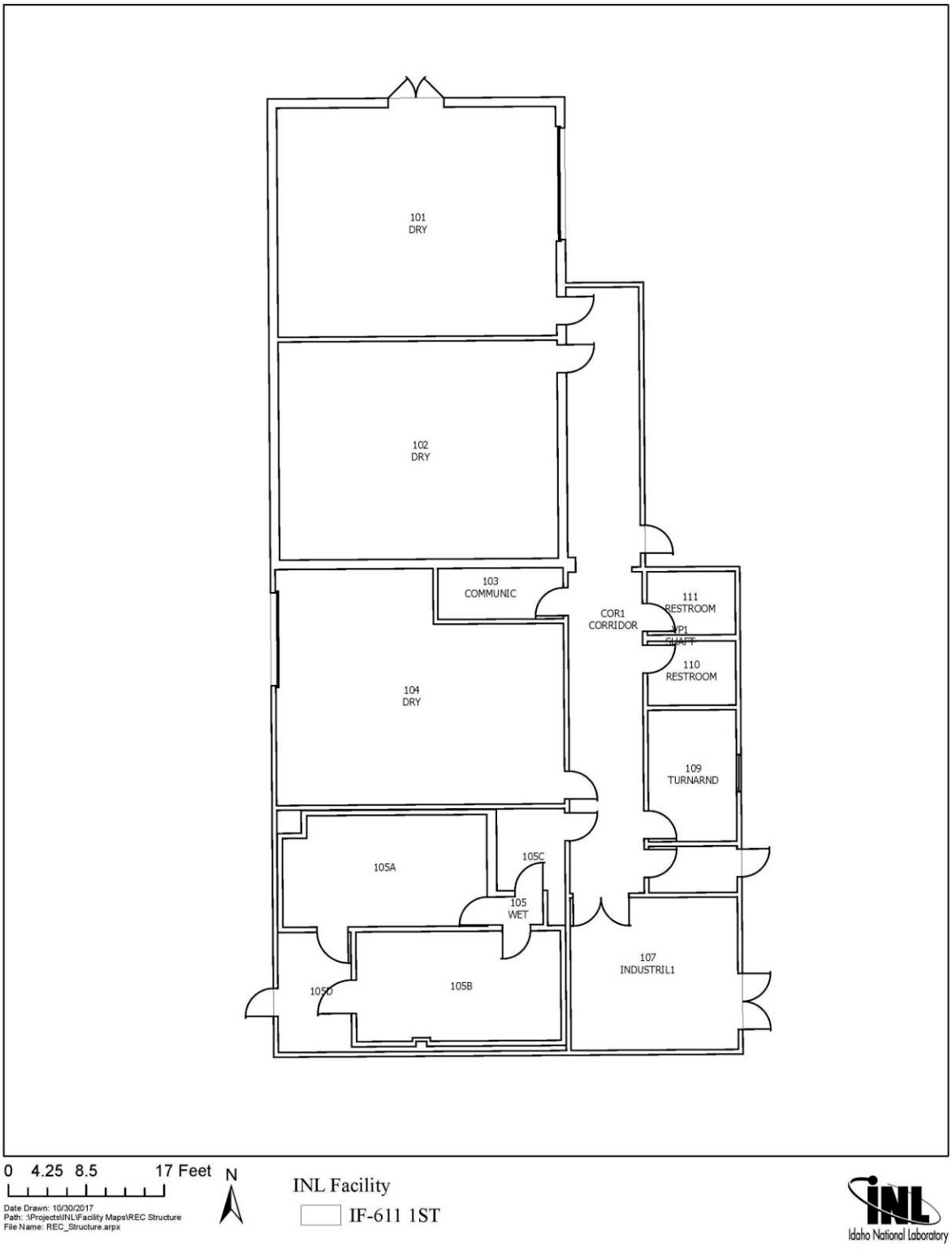

Figure A-10. IRC National Security Laboratory (IF-611) floor plan.

Figure A-11. IRC Systems Analysis Facility (IF-627) floor plan.

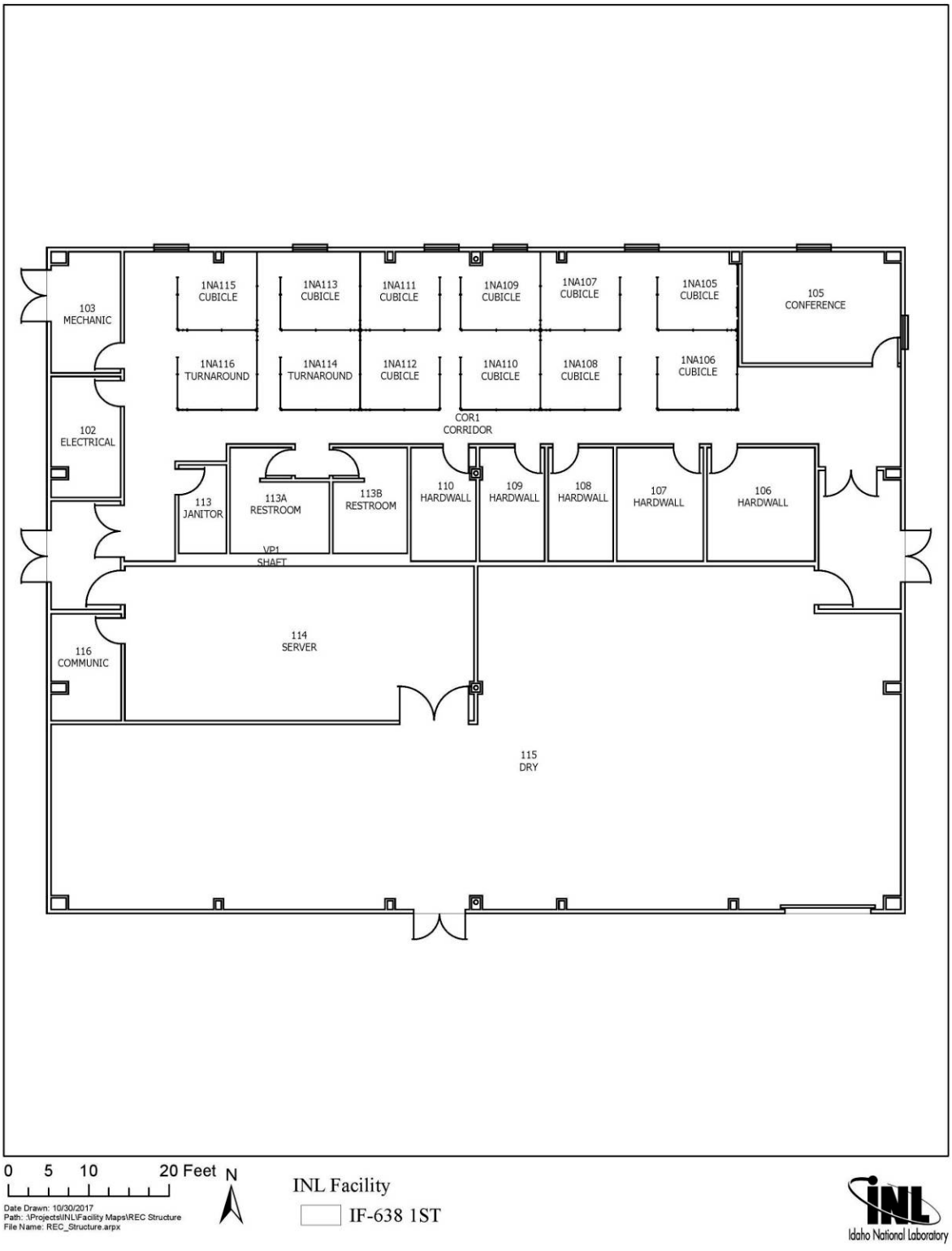

Figure A-12. IRC Physics Lab (IF-638) floor plan.

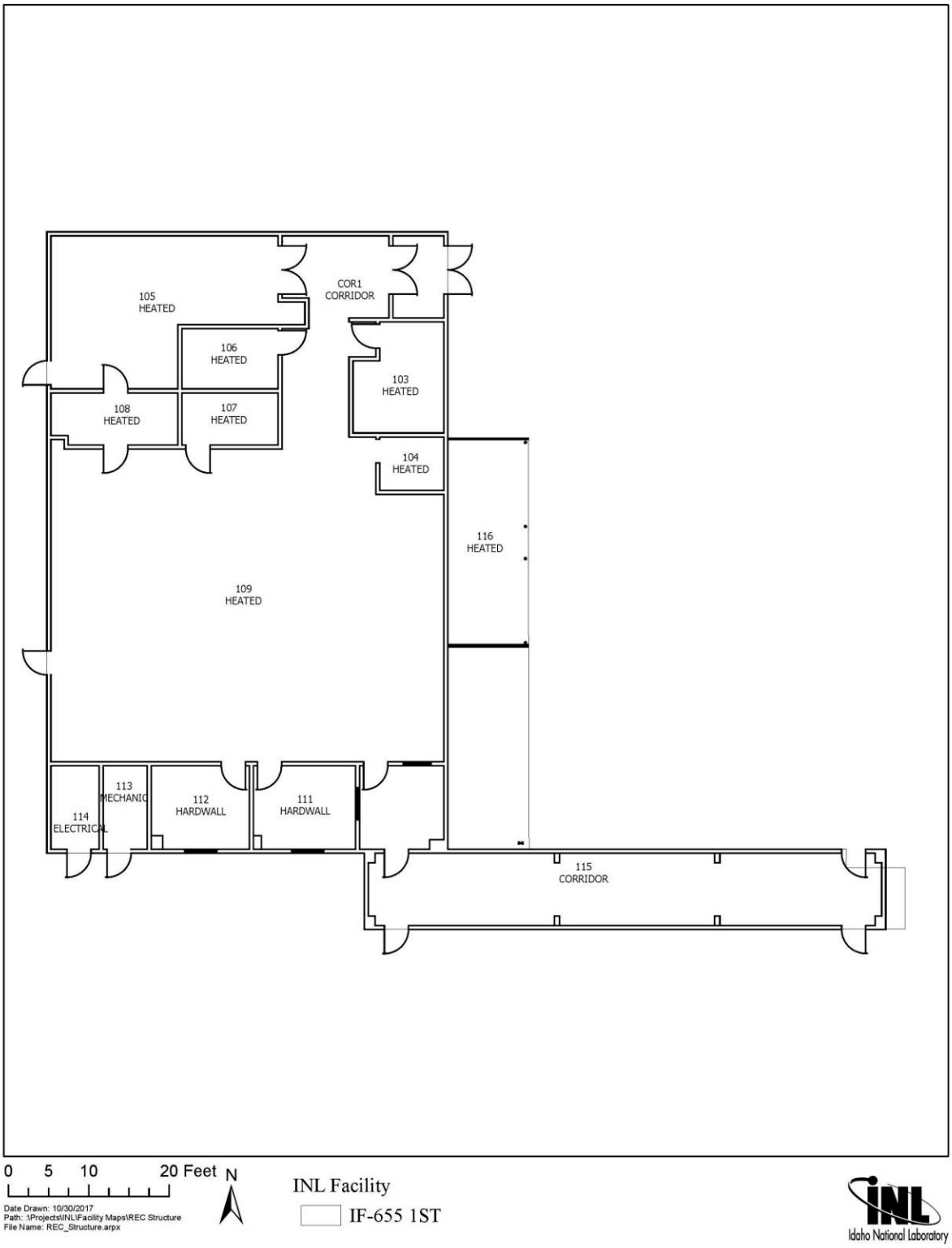

Figure A-13. IRC Chemical Storage Facility (IF-655) floor plan.

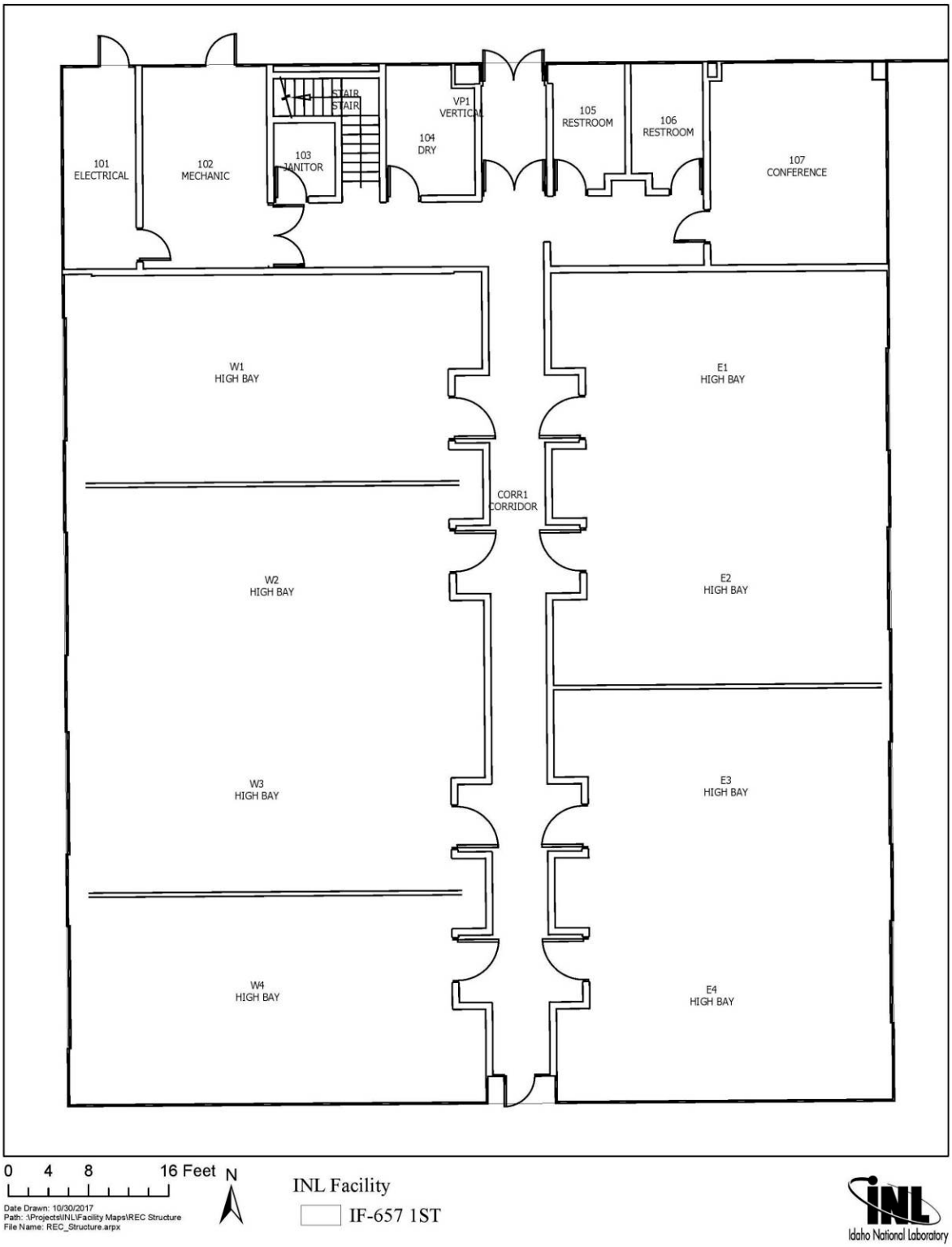

Figure A-14. IRC Idaho National Laboratory Engineering Demonstration Facility (IF-657) floor plan (1st floor).

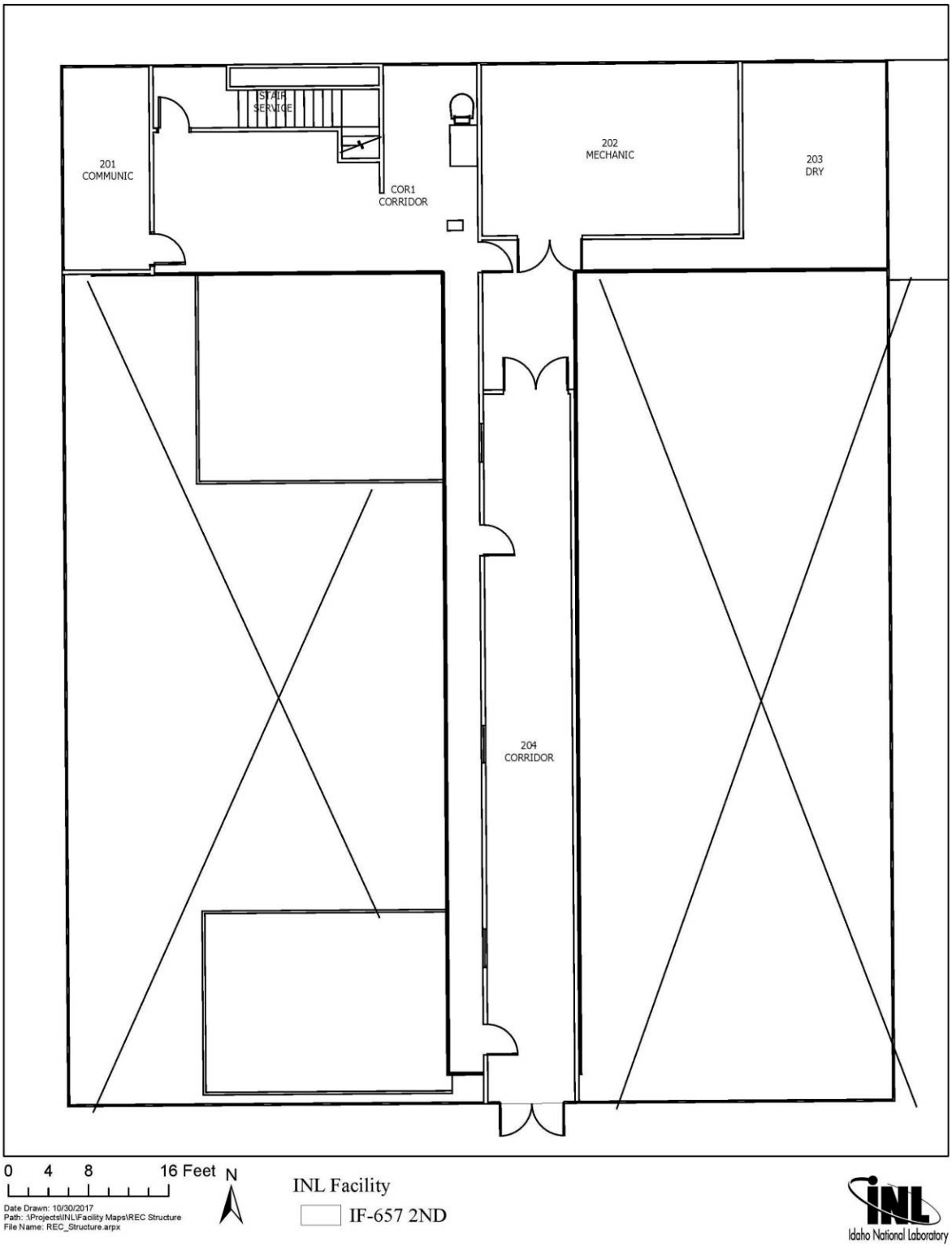

Figure A-15. IRC Idaho National Laboratory Engineering Demonstration Facility (IF-657) floor plan (2nd floor).

Exhibit B

Facility Descriptions

Idaho National Laboratory Research Center
Radiological and Environmental Sciences Office
(IF-601)

Facility Activity Description:

The Idaho National Laboratory Research Center Radiological and Environmental Sciences Office (IF-601) is owned by the Department of Energy and is operated by Battelle Energy Alliance, LLC.

This facility is used for offices and includes a men's and women's restroom and janitorial room with a sink.

Discharges to the City of Idaho Falls sewer system include drinking fountains, typical sanitary wastewater from the restrooms (sinks and toilets) and liquid from janitorial cleaning activities.

Administrative controls, identified in PLN-3530 (Accidental Spill Prevention Plan), are in place to ensure all discharges are in compliance with the sewer permit conditions.

Idaho National Laboratory Research Center
Office Building
(IF-602)

Facility Activity Description:

The Idaho National Laboratory Research Center Office Building (IF-602) is owned by the Department of Energy and is operated by Battelle Energy Alliance, LLC.

Building IF-602 has three floors and serves as an office building. Each floor has one or more men's and women's restrooms. Each floor also has a janitorial room and sink.

Discharges to the City of Idaho Falls sewer system include drinking fountains, typical sanitary wastewater from the restrooms (showers, sinks, and toilets), liquid from janitorial cleaning activities, and non-contact cooling water.

Administrative controls, identified in PLN-3530 (Accidental Spill Prevention Plan), are in place to ensure all discharges are in compliance with the sewer permit conditions.

Idaho National Laboratory Research Center
Laboratory Building
(IF-603)

Facility Activity Description:

The Idaho National Laboratory Research Center Laboratory Building (IF-603) is owned by the Department of Energy and is operated by Battelle Energy Alliance, LLC. The facility is used for office space, research and development activities. There are 66 laboratories located in this facility. Each laboratory contains utility sinks and floor drains (sealed where practical) that drain to the city sewer.

The facility is used principally for experimental research dedicated to a wide range of research activities, analytical techniques, and other facility support functions, such as facility maintenance. Unlike a production facility, the research activities in this building typically use a wide array of chemicals in very small quantities.

The normal route of release from the facility to the city sewer system is through the restrooms, laboratory sinks, and non-contact cooling water. The liquid waste from the restrooms is normal sanitary wastewater. Small amounts of chemicals, excluding radionuclides, attached to instruments and/or glassware are sometimes washed into the city sewer system.

Radionuclides are used in some of the laboratory activities. These include sealed and unsealed radioactive materials. Quantities of unsealed radionuclides presently allowed in IF-603 are limited to amounts less than a hazard category 3 nuclear facility threshold as defined in “DOE-1027-92, Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports."

The pH of the liquid effluent from IF-603 laboratories is continuously monitored. The monitoring station is downstream from the point where laboratory effluent enters the stream and upstream of the point where sewage enters the sewer system. An alert is received if the pH approaches the city sewer limit. If the alarm is triggered, the effluent is temporarily detained and neutralized.

Administrative controls, identified in PLN-3530 (Accidental Spill Prevention Plan), are in place to ensure all discharges are in compliance with the sewer permit conditions.

Idaho National Laboratory Research Center
National Security Laboratory
(IF-611)

Facility Activity Description:

The Idaho National Laboratory Research Center National Security Lab (IF-611) is owned by the Department of Energy (DOE) and operated by Battelle Energy Alliance, LLC.

Activities occurring in IF-611 include typical office activities and research programs. Discharges to the City of Idaho Falls sewer system include typical sanitary wastewater from the restrooms (sinks and toilets), air compressor blowdown, water softener regeneration, and a water heater.

Radionuclides are used in some of the laboratory activities. These include sealed and unsealed radioactive materials. Quantities of unsealed radionuclides presently allowed in IF-611 are limited to amounts less than a hazard category 3 nuclear facility threshold, as defined in "DOE-1027-92, Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports.

Laboratory environments include standard chemistry and biotechnology, physics, electronics, and materials (welding, machining, etc.). Small quantities of laboratory chemicals, excluding radionuclides, are discharged, however, administrative controls, identified in PLN-3530 (Accidental Spill Prevention Plan), are in place to ensure all discharges are in compliance with the sewer permit conditions.

Idaho National Laboratory Research Center
Systems Analysis Facility
(IF-627)

Facility Activity Description:

The Idaho National Laboratory Research Center Systems Analysis Facility (IF-627) is owned by the Department of Energy and is operated by Battelle Energy Alliance, LLC. Facility is utilized primarily as office space with a separate lab area. This lab is used for glass blowing activities.

There is a sink in the glass shop. Non-contact cooling water from the glass saws, mill, and sander are discharged into the drain.

There is a men's and women's restroom, a janitorial room with a sink, and a kitchen area with a sink. There are also discharges from air handling units, a water heater, and an air compressor.

Administrative controls, identified in PLN-3530 (Accidental Spill Prevention Plan), are in place to ensure all discharges are in compliance with the sewer permit conditions.

Idaho National Laboratory Research Center
Physics Laboratory
(IF-638)

Facility Activity Description:

The Idaho National Laboratory Research Center Physics Laboratory (IF-638) is owned by the Department of Energy and is operated by Battelle Energy Alliance, LLC.

Approximately half of the building is used as office space.

The rest of the facility is used as a physics research laboratory. The laboratory houses nuclear physics experiments supporting arms control, technical transfer, spent fuel characterization, radiation detection system development, and development of nondestructive examination and assay systems. The research involves the development of nuclear and non-nuclear instrumentation to be used in collaboration in basic research and direct programmatic efforts.

Radionuclides are used in some of the laboratory activities. These include sealed and unsealed radioactive materials. Quantities of unsealed radionuclides presently allowed in IF-638 are limited to amounts less than a hazard category 3 nuclear facility threshold, as defined in "DOE-1027-92, Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports.

The facility includes a men's and women's restroom and a janitorial room with a sink. Other liquid effluents include potable water used for nondestructive tests, and discharges from air handling units and a water heater.

Administrative controls, identified in PLN-3530 (Accidental Spill Prevention Plan), are in place to ensure all discharges are in compliance with the sewer permit conditions.

Idaho National Laboratory Research Center
Chemical Storage Facility
(IF-655)

Facility Activity Description:

The Idaho National Laboratory Research Center (IRC) Chemical Storage Facility (IF-655) is owned by the Department of Energy and is operated by Battelle Energy Alliance, LLC.

Facility IF-655 is utilized primarily as a safe and environmentally sound storage area for management of chemicals associated with IRC activities. The building was designed for chemical management following applicable guidelines in the Uniform Building Codes, National Fire Protection Association, and conforms to other safety and environmental requirements for buildings used for chemical storage and management. There are offices occupied by personnel responsible for the daily operation of IF-655.

The Chemical Storage Facility has no restrooms or janitorial rooms/sinks and no floor drains. There are several safety eyewash/shower stations located throughout the building. Water from these stations would drain to the floor and/or into one of several concrete sumps (without drains). Water and any associated chemicals would be cleaned up and disposed in accordance with all applicable requirements and regulations.

There are two sinks with faucets that drain to the City sewer system. The sinks are only used for hand washing. Actual chemical use in the facility is limited to standard office and janitorial cleaning products. No hazardous chemicals are discharged to the sinks.

Administrative controls, identified in PLN-3530 (Accidental Spill Prevention Plan), are in place to ensure all discharges are in compliance with the sewer permit conditions.

Idaho National Laboratory Research Center
Engineering Demonstration Facility
(IF-657)

Facility Activity Description:

The Idaho National Laboratory Research Center (IRC) Engineering Demonstration Facility (IF-657) is owned by the Department of Energy and is operated by Battelle Energy Alliance, LLC.

Major activities that are performed in the IRC Engineering Demonstration Facility include:

Bay E1 and E2. Matched Index of Refraction (MIR) test system. This system is designed to be able to test flow patterns of liquid or wind around an object or within a piping system. The system utilizes a laminar flow of high purity mineral oil pumped through a closed loop into which is inserted the test object/system. The disturbance to the laminar flow of oil is recorded for analysis of ways to improve flow through a system, or areas of potential impacts. This project is currently on hold until further funding is available.

Bay E3 and E4: Structural Dynamics Testing. The test setup consists of a reaction frame, two electrical actuators, soil box, structure models, and soil specimens to determine the interaction between structures and soils under the simulated seismic conditions representing real-life demands for the safety-critical structures and nuclear power plants.

Bay W1: Cold Crucible Induction Melter (CCIM). This pilot plant system demonstrates the reduction and immobilization of simulated slurry and sludge wastes (i.e., mostly surrogate radioactive High-Level –Wastes (HLWs) from Hanford legacy defense operations and future proposed raffinates from commercial nuclear fuel recycling) to a solid glass, glass/ceramic or multiple phase pure ceramic waste form prior to final disposal. In contrast to the current methods of deploying corrosive prone in-bed electrodes and refractory, this cost effective, higher waste throughput melter and associated off-gas system uses a 60KW RF induction coil to heat the simulated HLW and additives in a nonconductive/ transparent 10.4 inch diameter crucible – constructed of water cooled tubes-to temperatures above 1500 degrees C. Upon crucible tapping, draining and cooling, the CCIM produces a high waste mass loaded, low volume glass/ceramic like waste form. As a result, this waste form is highly durable (i.e., very resistant to both radionuclide and hazardous material leaching) for 100s of thousands of years. This project is currently on hold until further funding is available.

Bay W2: This bay houses cabinets and other experimental equipment such as casks that are used to test prior to use in the field. No waste is currently generated that would enter the drains.

Bay W3: SPECTR. A large vacuum/pressure furnace designed to test the efficiency and effects of heat and pressure on heat exchangers. The furnace uses a closed loop cooling system to maintain seal integrity and keep surface temperatures below 50^{o}C.

Bay W4. Tristructural Isotropic Fuel Oxidation Tests, Channel Gap Probe System. First is a mock up system designed to measure the spacing between fuel plates before and after exposure in a reactor to determine deformation of the plates after irradiation. This system is used to test the tools and equipment using surrogate radiological and non-radiological test specimens prior to installing the tools on an identical system at the Advanced Test Reactor. This system is immersed in a large water tank full of deionized water when tests are performed. Second is a non-radioactive benchtop testing of a horizontal tube furnace, test gas preparation equipment/methodology, gas analysis instrumentation, and other supporting systems/instrumentation to test thermomechanical integrity of ceramic furnace tube materials (e.g., ZrO2, Al2O3, and SiC). Particular attention will be paid to thermal stress resistance at temperatures up to 1600°C. The furnace is contained within a polycarbonate enclosure. Connections between the ceramic tube and metal piping will be tested at temperatures of about 150°C. Trace heating of the portions of the furnace tube (and other tubing) extending outside of the furnace will be tested. The temperature profiles within the furnace and the furnace tube will be measured at various furnace temperature set points, and thermocouple placements throughout the furnace.

The facility has a men's and women's restroom, a break room with a sink, and a compressor room. Discharges include sanitary wastewater and water from air handling units, a water softener, a water heater, and an air compressor.

There is a sink in all of the bays, with the exception of Bay E2. Special design criteria for the facility include impervious concrete floors and walls. Floor drains are routed to sublevel holding areas and then to a sump. The sump accumulates liquids that are then discharged to the city sewer system. Discharges consist of various liquid discharges from the bench scale equipment.

Administrative controls, identified in PLN-3530 (Accidental Spill Prevention Plan), are in place to ensure all discharges are in compliance with the sewer permit conditions.

Idaho National Laboratory Research Center
North Firewater Pump House #1
(IF-732)

Facility Activity Description:

The Idaho National Laboratory Research Center North Firewater Pump House #1 (IF-732) is owned by the Department of Energy and operated by Battelle Energy Alliance, LLC.

There is a 300 gallon diesel fuel tank for the firewater pump.

The only discharge from this building to the city sewer system is from noncontact cooling water.

Administrative controls, identified in PLN-3530 (Accidental Spill Prevention Plan), are in place to ensure all discharges are in compliance with the sewer permit conditions.

Exhibit C

Chemical List by Building

Table C-1. IF-601 maximum chemical inventory, in pounds, for the period of December 1, 2016 through November 30, 2017.

Chemical CAS	**Chemical Name**	**Maximum (lbs)[a]**
1310-73-2	Sodium hydroxide	2.5402335
8042-47-5	mineral oil	3.051279
7681-52-9	Sodium hypochlorite	3.328668
193-39-5	Indeno(1,2,3-cd)pyrene	10.9956
205-99-2	Benzo[b]fluoranthene	10.9956
207-08-9	Benzo(k)fluoranthene	10.9956
218-01-9	Benzo(a)phenanthrene	10.9956
50-32-8	Benzo[a]pyrene	10.9956
53-70-3	Dibenz[a,h]anthracene	10.9956
56-55-3	Benz[a]anthracene	10.9956
71-43-2	Benzene	10.9956
7439-92-1	Lead	10.9956
7440-38-2	Arsenic	10.9956
7440-43-9	Cadmium	10.9956
1310-73-2	Sodium hydroxide	2.5402335

a. Only chemicals of one pound or greater are shown in this table.

Table C-2. IF-602 maximum chemical inventory, in pounds, for the period of December 1, 2016 through November 30, 2017.

Chemical CAS	Chemical Name	Maximum (lbs)[a]
8042-47-5	mineral oil	2.061675
1310-73-2	Sodium hydroxide	2.12415
a. Only chemicals of one pound or greater are shown in this table.		

Table C-3. IF-603 maximum chemical inventory, in pounds, for the period of December 1, 2016 through November 30, 2017.

Chemical CAS	**Chemical Name**	**Maximum (lbs)[a]**
10294-34-5	Borane, trichloro-	1
134-32-7	alpha-Naphthylamine	1.041961922
84-74-2	Dibutyl phthalate	1.060386063
75-36-5	Acetyl chloride	1.080265204
7726-95-6	Bromine	1.093286294
10101-89-0	Sodium phosphate, tribasic	1.102311432
3164-29-2	Ammonium tartrate	1.102311432
62-56-6	Thiourea	1.102311432
7773-06-0	Ammonium sulfamate	1.102311432
65-85-0	Benzoic acid	1.104516054
628-63-7	Amyl acetate	1.112516125
75-07-0	Acetaldehyde	1.313879927
141-78-6	Ethyl acetate	1.323128107
7783-06-4	Hydrogen sulfide	1.46188477
71-55-6	1,1,1-Trichloroethane	1.530472649
1341-49-7	Ammonium bifluoride	1.653467148
107-15-3	1,2-Ethanediamine	2.024320156
7722-64-7	Potassium permanganate	2.160530408
79-00-5	1,1,2-Trichloroethane	2.200553164
1111-78-0	Ammonium carbamate	2.204622865
7778-54-3	Calcium hypochlorite	2.204622865
71-36-3	n-Butyl alcohol	2.206853009
27323-41-7	Triethanolamine dodecylbenzene sulfonate	2.443897134
85-68-7	Butyl benzyl phthalate	2.456093934
62-75-9	Methanamine, N-methyl-N-nitroso-	2.853025
96-09-3	Styrene oxide	2.853025
7446-09-5	Sulfur dioxide	3.091966358
7664-39-3	Hydrofluoric acid	3.234565256
506-87-6	Ammonium carbonate	3.284888068
7601-54-9	Sodium phosphate, tribasic	3.46528
3012-65-5	Ammonium citrate dibasic	3.527396582
10192-30-0	Ammonium bisulfite	3.900943958
127-18-4	Perchloroethylene	4.239115924
108-95-2	Phenol	4.322376423
7758-29-4	Sodium phosphate, tribasic	4.374767072
110-16-7	Maleic acid	4.376176387
75-56-9	Oxirane, methyl-	4.450086071
58-36-6	Phenoxarsine, 10,10'-oxydi-	4.558013279
631-61-8	Ammonium acetate	4.608084045
7439-97-6	Mercury	5.00007716
108-10-1	Methyl isobutyl ketone	5.071473591
123-31-9	Hydroquinone	5.16119597
156-60-5	1,2-Dichloroethylene	5.165192692
111-42-2	Diethanolamine	5.538566068

109-99-9	Furan, tetrahydro-	5.646777125
123-91-1	1,4-Dioxane	5.878479335
68-12-2	Dimethylformamide	6.257056366
1066-33-7	Ammonium bicarbonate	6.613868593
1314-62-1	Vanadium pentoxide	6.756
79-34-5	1,1,2,2-Tetrachloroethane	6.987816724
108-94-1	Cyclohexanone	7.010046106
123-86-4	Butyl acetate	7.070368791
7722-84-1	Hydrogen peroxide (Conc.> 52%)	7.23888909
60-00-4	Ethylenediamine-tetraacetic acid (EDTA)	7.292366193
67-72-1	Hexachloroethane	7.759585935
100-42-5	Styrene	7.982649353
106-42-3	Benzene, p-dimethyl-	8.257911333
106-42-3	Benzene, p-dimethyl-	8.257911333
7664-41-7	Ammonia	8.699095873
10043-01-3	Aluminum sulfate	8.708796126
75-21-8	Ethylene oxide	8.754465764
64-18-6	Formic acid	9.458099229
7681-52-9	Sodium hypochlorite	10.27975095
75-05-8	Acetonitrile	10.37590881
7782-63-0	Ferrous sulfate	10.93492941
79-06-1	Acrylamide	10.98474012
110-54-3	Hexane	11.18865841
25155-30-0	Sodium dodecylbenzenesulfonate	12.14219303
540-84-1	2,2,4-Trimethylpentane	12.38421251
27176-87-0	Dodecylbenzenesulfonic acid	12.495
1336-21-6	Ammonium hydroxide	12.69462051
79-01-6	Trichloroethylene	12.75073208
98-82-8	Cumene	13.62703762
110-82-7	Cyclohexane	13.90789325
7440-36-0	Antimony	14.7138151
12125-02-9	Ammonium chloride	14.91049467
7786-81-4	Nickel sulfate	15.06897
7558-79-4	Sodium phosphate, dibasic	16.34816647
7720-78-7	Ferrous sulfate	18.73929435
67-66-3	Chloroform	19.38140241
75-09-2	Dichloromethane	22.10657064
7440-22-4	Silver	23.00604651
78-93-3	Methyl ethyl ketone	23.13064897
7646-85-7	Zinc chloride	23.9802613
64-19-7	Acetic acid	27.10967391
7723-14-0	Phosphorus	36.92660295
71-43-2	Benzene	41.1685538
100-41-4	Ethylbenzene	41.54447251
7647-01-0	Hydrochloric acid	50.28478936

75-71-8	CFC-12	52.54418666
91-20-3	Naphthalene	54.20870089
7681-49-4	Sodium fluoride	56.95803684
7664-38-2	Phosphoric acid	57.13945989
75-69-4	CFC-11	59.94006592
1330-20-7	Xylene (mixed isomers)	82.58676515
7664-93-9	Sulfuric acid	89.85901941
7697-37-2	Nitric acid	89.98223244
7440-38-2	Arsenic	91.88616825
7440-43-9	Cadmium	92.08967838
7632-00-0	Sodium nitrite	92.90768218
50-00-0	Formaldehyde	96.45817125
1310-73-2	Sodium hydroxide	100.6610995
7439-92-1	Lead	116.7901723
67-64-1	Acetone	121.6802462
8042-47-5	mineral oil	125.3574148
108-88-3	Toluene	132.7478377
7440-66-6	Zinc	166.1177683
67-56-1	Methanol	167.2415449
1310-58-3	Potassium hydroxide	190.3787864
7440-50-8	Copper	414.618966
107-21-1	Ethylene glycol	509.996097
57-55-6	propylene glycol	521.2922946
7440-47-3	Chromium	528.1067845
7440-02-0	Nickel	939.3841434
a. Only chemicals of one pound or greater are shown in this table.		

Table C-4. IF-611 maximum chemical inventory, in pounds, for the period of December 1, 2016 through November 30, 2017.

Chemical CAS	**Chemical Name**	**Maximum (lbs)[a]**
7722-64-7	Potassium permanganate	1.080265204
7631-90-5	Sodium bisulfite	1.091288318
7722-84-1	Hydrogen peroxide (Conc.> 52%)	1.095875475
7782-63-0	Ferrous sulfate	1.102311432
67-64-1	Acetone	1.856968253
7664-39-3	Hydrofluoric acid	1.965864168
1762-95-4	Ammonium thiocyanate	2.204622864
7758-29-4	Sodium phosphate, tribasic	2.24
7439-92-1	Lead	3.003755067
7647-01-0	Hydrochloric acid	3.023560047
7632-00-0	Sodium nitrite	3.527396584
8042-47-5	mineral oil	3.881775781
75-21-8	Ethylene oxide	4.20665
7664-93-9	Sulfuric acid	4.828013641
1336-21-6	Ammonium hydroxide	7.578705096
7697-37-2	Nitric acid	8.101589536
1310-73-2	Sodium hydroxide	12.09521845

a. Only chemicals of one pound or greater are shown in this table.

Table C-5. IF-627 maximum chemical inventory, in pounds, for the period of December 1, 2016 through November 30, 2017.

Chemical CAS	**Chemical Name**	**Maximum (lbs)[a]**
1310-73-2	Sodium hydroxide	2.12415
110-54-3	Hexane	2.36625
71-43-2	Benzene	2.640663796
27323-41-7	Triethanolamine dodecylbenzene sulfonate	4.2545475
8042-47-5	mineral oil	4.590784488
67-64-1	Acetone	10.2
a. Only chemicals of one pound or greater are shown in this table.		

Table C-6. IF-638 maximum chemical inventory, in pounds, for the period of December 1, 2016 through November 30, 2017.

Chemical CAS	**Chemical Name**	**Maximum (lbs)[a]**
7440-36-0	Antimony	1.000077162
7440-22-4	Silver	1.11
67-64-1	Acetone	1.352896519
7439-92-1	Lead	1.408129943
8042-47-5	mineral oil	2.061675
1310-73-2	Sodium hydroxide	2.12415
100-42-5	Styrene	3.432139393
131-11-3	Dimethyl phthalate	3.644749798
1338-23-4	Methyl ethyl ketone peroxide	4.049721998
7440-02-0	Nickel	5
7440-47-3	Chromium	5.0000005
7440-50-8	Copper	6.0275
a. Only chemicals of one pound or greater are shown in this table.		

Table C-7. IF-655 maximum chemical inventory, in pounds, for the period of December 1, 2016 through November 30, 2017.

Chemical CAS	Chemical Name	Maximum (lbs)[a]
75-36-5	Acetyl chloride	1.080265204
10101-89-0	Sodium phosphate, tribasic	1.102311432
143-33-9	Sodium cyanide	1.102311432
7758-98-7	Cupric sulfate	1.102311432
79-11-8	Chloroacetic acid	1.102311432
10043-01-3	Aluminum sulfate	1.102311433
65-85-0	Benzoic acid	1.102334316
628-63-7	Amyl acetate	1.120585369
1185-57-5	Ferric ammonium citrate	1.23826247
631-61-8	Ammonium acetate	1.271754025
75-15-0	Carbon disulfide	1.386348493
107-06-2	1,2-Dichloroethane	1.522342678
7789-06-2	Strontium chromate	1.763698291
110-16-7	Maleic acid	2.171553522
79-00-5	1,1,2-Trichloroethane	2.200553164
75-79-6	Methyltrichlorosilane	2.204622864
7782-86-7	Mercurous nitrate	2.204622864
1327-53-3	Arsenic trioxide	2.204622865
7778-54-3	Calcium hypochlorite	2.204622865
78-83-1	Isobutyl alcohol	2.204622865
100-41-4	Ethylbenzene	2.31464504
1341-49-7	Ammonium bifluoride	2.504502865
85-68-7	Butyl benzyl phthalate	2.562002493
12125-02-9	Ammonium chloride	2.564893457
123-31-9	Hydroquinone	2.854524425
7681-49-4	Sodium fluoride	3.170247671
74-89-5	Methanamine	3.217867534
78-93-3	Methyl ethyl ketone	3.24880382
123-86-4	Butyl acetate	3.861125
75-36-5	Acetyl chloride	1.080265204
1314-62-1	Vanadium pentoxide	4.102320203
71-43-2	Benzene	4.310269272
71-55-6	1,1,1-Trichloroethane	4.373883579
75-56-9	Oxirane, methyl-	4.450085277
109-99-9	Furan, tetrahydro-	4.647671451
111-42-2	Diethanolamine	4.748144148
7681-52-9	Sodium hypochlorite	5.148719792
3012-65-5	Ammonium citrate dibasic	5.511557162
1330-20-7	Xylene (mixed isomers)	6.061745796
79-06-1	Acrylamide	6.116137349
75-25-2	Bromoform	6.359598643
64-18-6	Formic acid	6.645010619
10039-32-4	Sodium phosphate, dibasic	6.689681618
79-34-5	1,1,2,2-Tetrachloroethane	6.900734121
127-18-4	Perchloroethylene	7.118242214
7440-36-0	Antimony	7.155281586

21908-53-2	Mercuric oxide	7.771856428
7782-63-0	Ferrous sulfate	8.730306546
56-23-5	Carbon tetrachloride	8.75747323
60-00-4	Ethylenediamine-tetraacetic acid (EDTA)	8.818491474
79-01-6	Trichloroethylene	9.627709306
7722-84-1	Hydrogen peroxide (Conc.> 52%)	11.1949515
7664-41-7	Ammonia	11.24721865
7440-22-4	Silver	11.67094013
1066-33-7	Ammonium bicarbonate	14.33004862
7720-78-7	Ferrous sulfate	14.33004862
7786-81-4	Nickel sulfate	15.06897
7664-39-3	Hydrofluoric acid	16.8847344
540-84-1	2,2,4-Trimethylpentane	19.93327072
7646-85-7	Zinc chloride	20.25394079
1336-21-6	Ammonium hydroxide	21.3489202
64-19-7	Acetic acid	22.95844212
75-05-8	Acetonitrile	23.88425036
77-92-9	citric acid	27.40325917
75-07-0	Acetaldehyde	28.63478374
110-82-7	Cyclohexane	28.70002147
123-91-1	1,4-Dioxane	30.46467806
75-21-8	Ethylene oxide	30.46470283
7558-79-4	Sodium phosphate, dibasic	30.74919696
75-09-2	Dichloromethane	41.372742
107-21-1	Ethylene glycol	45.50756502
110-54-3	Hexane	45.91181947
67-66-3	Chloroform	45.98614748
7632-00-0	Sodium nitrite	50.33883749
7440-50-8	Copper	64.56656693
108-88-3	Toluene	65.12091907
7664-93-9	Sulfuric acid	75.40624261
7440-66-6	Zinc	89.46343819
7647-01-0	Hydrochloric acid	93.29133811
7440-38-2	Arsenic	93.83473888
7440-43-9	Cadmium	97.54899102
67-64-1	Acetone	99.7593414
1310-58-3	Potassium hydroxide	103.1212531
8042-47-5	mineral oil	105.10721
7664-38-2	Phosphoric acid	106.4544126
1310-73-2	Sodium hydroxide	110.8343885
7439-92-1	Lead	115.2127499
67-56-1	Methanol	148.7886621
50-00-0	Formaldehyde	172.3534664
7440-47-3	Chromium	180.7968998
7440-02-0	Nickel	472.8102625
a. Only chemicals of one pound or greater are shown in this table.		

Table C-8. IF-657 maximum chemical inventory, in pounds, for the period of December 1, 2016 through November 30, 2017.

Chemical CAS	**Chemical Name**	**Maximum (lbs)[a]**
7439-92-1	Lead	1.0000005
27176-87-0	Dodecylbenzenesulfonic acid	1.04125
78-93-3	Methyl ethyl ketone	1.598150944
100-42-5	Styrene	2.16
8042-47-5	mineral oil	2.633821998
109-99-9	Furan, tetrahydro-	2.675866725
85-68-7	Butyl benzyl phthalate	2.84886
1310-73-2	Sodium hydroxide	3.226461431
7440-22-4	Silver	6.7
7440-66-6	Zinc	7.5
7440-02-0	Nickel	7.902418242
7664-93-9	Sulfuric acid	9.920093661
7664-38-2	Phosphoric acid	12.411935
7440-50-8	Copper	12.57731143
101-68-8	MDI	15.19392
7439-97-6	Mercury	18.9924
1309-64-4	Antimony trioxide	87.12669562

a. Only chemicals of one pound or greater are shown in this table.

Table C-9. IF-732 maximum chemical inventory, in pounds, for the period of December 1, 2016 through November 30, 2017.

Chemical CAS	**Chemical Name**	**Maximum (lbs)[a]**
92-52-4	Biphenyl	7.860531757
98-82-8	Cumene	7.862463566
100-41-4	Ethylbenzene	8.558880794
91-20-3	Naphthalene	9.550864833
110-80-5	2-Ethoxyethanol	1931.80923
1330-20-7	Xylene (mixed isomers)	1940.374872
106-44-5	p-Cresol	1961.58888
108-39-4	m-Cresol	1961.58888
108-88-3	Toluene	1961.58888
108-95-2	Phenol	1961.58888
71-43-2	Benzene	1961.58888
95-48-7	o-Cresol	1961.58888
108-05-4	Acetic acid ethenyl ester	1961.594765
a. Only chemicals of one pound or greater are shown in this table.		

Exhibit D

INL Research Complex (IRC) Accidental Spill Prevention Plan, PLN-3530

REVISION LOG

Rev.	Date	Affected Pages	Revision Description
0	08/12/10	All	New document.
1	11/28/12	All	See eCR 609456.
2	01/03/18	All	See eCR 655181
3	01/25/18	1,2	Table 1. IRC buildings regulated under PER-33. Deleted IF-605, IF-663, IF-683, IF-731, and IF-689. These building are NOT regulated under PER-33.

CONTENTS

TABLES

ACRONYMS

ASPP	Accidental Spill Prevention Plan
AST	Aboveground Storage Tank
BS	Building Specialist
CFR	Code of Federal Regulations
DBM	Duty Building Manager
DOE	Department of Energy
ES&H	Environmental, Safety, and Health
FCM	Facility Complex Manager
HVAC	Heating, Ventilation, and Air Conditioning
INL	Idaho National Laboratory
IRC	INL Research Center
POTW	Publicly Owned Treatment Works
RCRA	Resource Conservation and Recovery Act
REC	Research and Education Campus
SAA	Satellite Accumulation Area
SNT	Spill Notification Team
TAA	Temporary Accumulation Area
UST	Underground Storage Tank

1. PURPOSE

The purpose of the INL Research Center (IRC) accidental spill prevention plan (ASPP) is to describe discharge practices, chemical storage, notification procedures, and procedures to prevent adverse impact from accidental or slug discharges of pollutants into the Idaho Falls wastewater collection system.

2. SCOPE

The IRC ASPP establishes practices for preventing accidental discharge (i.e., spills) of pollutants or slug discharges into the Idaho Falls wastewater collection system, as required by the IRC "Industrial Wastewater Acceptance Permit," INL document PER-33. This ASPP applies to pollutants used on properties identified in PER-33. All INL programs or projects using pollutants on these properties that are at risk of being spilled (or released) to the Idaho Falls wastewater collection system are responsible for meeting the intent and requirements of this IRC ASPP. This ASPP addresses the discharge of pollutants, as defined by Title 8 of the Idaho Falls Code of Ordinances, "Public Utilities and Property," Chapter 1, "Sewers."

3. FACILITY DESCRIPTION

The IRC is a group of buildings, located on United States Department of Energy (DOE) property and part of the INL's Research and Education Campus (REC). The IRC buildings that are subject to PER-33 are listed in Table 2 below, along with a brief description of the materials that are potential pollutants if discharged to the Idaho Falls wastewater collection system. All IRC building sinks and floor drains ultimately discharge (along with hand soap and janitorial products) to the city's system. INL drawing 180052 shows the IRC sewer piping system and its tie-in to the city's main. Access to IRC buildings is controlled, with security personnel readily available.

Table 2. IRC buildings regulated under PER-33.

Building No.	Building Name/Description	Potential Wastewater Pollutants
IF-601	Research Office Building No. 1 IF-601 is a single-story office complex. This building provides office space for engineers, scientists, and technicians.	Janitorial products
IF-602	IRC Office Building The IRC Office Building provides office space for engineer, scientist, and technician, as well as seismic and scanning transmission electronic microscope activities.	Heating, ventilation, and air conditioning (HVAC) water treatment chemicals Janitorial products Facility maintenance products Diesel fuel • 27-gal aboveground storage tank (AST) day tank for emergency generator, NW of building • 600-gal Underground Storage Tank (UST) for emergency generator, NW of building

Building No.	Building Name/Description	Potential Wastewater Pollutants
IF-603	IRC Laboratory Building This building is the primary science and engineering laboratory at the REC. There are about 45 analytical research labs located in the A and B wings, including biology, chemistry, physics, ceramics, laser, hydrology, and subsurface sciences disciplines. There are also several spectrometry labs. There is a bio-wing high bay on the east side of building. Stored energy, welding/joining/spray, materials testing, metallography, and measurement and operability labs are located in the C wing. A craft area includes general carpenter, mechanic, pipefitter, electrician and electronics shops that support facility maintenance, as well as the staging/mockup area. Machine and weld shops support experiment fabrication and assembly. IF-603 has numerous small storage areas (including a temporary accumulation area [TAA] in room A6 and satellite accumulation areas [SAAs] in several labs), two outside cylinder staging areas along the west end of the north side, and an effluent monitoring station located on the west side of the building.	Janitorial products Extensive laboratory chemicals HVAC water treatment chemicals Facility maintenance products Hazardous waste Radionuclides Compressor blowdown Water softener discharge Biological agents Diesel fuel • 56-gal AST day tank for emergency generator, N of building • 2,500-gal UST for emergency generator, N of building
IF-611	National Security Laboratory IF-611 is a national security laboratory that supports classified research and development. The building houses four classified laboratory bays.	Minimal laboratory chemicals Janitorial products Compressor blowdown Water softener discharge
IF-627	Systems Analysis Facility This building is currently used as an office area with two lab areas currently used for electronic and material stress research..	Janitorial products Compressor blowdown
IF-638	IRC Physics Laboratory The Applied Physics Laboratory includes a physics laboratory and test equipment; work is conducted utilizing sealed radiological sources.	Minimal laboratory chemicals Janitorial products
IF-655	IRC Chemical Storage Facility This building is used to store bulk chemicals and prepare them for lab use. The chemical storage space consists of a general chemical room, acid storage room, caustic storage room, flammable liquids storage room, flammable solids storage room, and an oxidizer storage room. The flammable liquids, flammable solids, and oxidizer storage rooms are separated from the remainder of the building by rated firewalls. There are no wastewater drains in this building. Unheated cylinder storage is provided on the east side of the building.	Extensive laboratory chemicals Janitorial products

Building No.	Building Name/Description	Potential Wastewater Pollutants
IF-657	INL Engineering Demonstration Facility This large-scale demonstration/research building supports multiple, varying research projects in eight high bays and one prep lab, and includes a mezzanine control room and equipment lab.	Janitorial products Laboratory chemicals Mineral oil (10 350-gal ASTs in E-I Bay mezzanine) Compressor blowdown Water softener discharge
IF-732	North Fire Pump House - This building houses equipment that provides backup fire protection in the event that city water supply is interrupted.	Diesel fuel (300-gal AST) Motor oil

4. SPILL PREVENTION PRACTICES

4.1 Description of Stored Chemicals

A wide variety of products and chemicals are stored and used at IRC buildings; typical categories and types are listed in Table 2.

Table 2. Types of chemicals at the IRC.

Category	Type
Fuels, coolants, and lubricants	• Diesel fuel • Motor oil • Antifreeze • Mineral oil • Lubricating oils and greases
Laboratory chemicals	• Standards • Reagents • Acids and bases • Flammable and combustible liquids • Organics • Alcohols • Metals • Biological agents • Radionuclides
Maintenance products	• Janitorial cleaners • Paints and stains • Epoxies • Adhesives • Solvents • Wood finishing products • Metal-working chemicals • Refrigerants • HVAC water treatment chemicals (corrosives, inhibitors, and

Large chemical inventories are stored at the IRC Chemical Storage Facility, IF-655, in controlled areas with appropriate secondary containment. There are no drains in IF-655. Chemicals are checked out/in to/from the research areas, as applicable. Chemical containers are not generally opened in IF-655; the desired quantities are removed in the labs using appropriate chemical handling protocol. The checked-out container may then be returned to IF-655.

Smaller quantities of laboratory type chemicals are stored in the laboratories in cabinets appropriate for the hazards (e.g., separate corrosives, reactives, and flammables cabinets).

Fuels, coolants, lubricants and facility maintenance products are generally stored near their place of use. HVAC water treatment chemicals for IF-603 are stored in a locked storage room with secondary containment or at IF-655.

4.2 Immediate Notification Procedures

PER-33 requires that the INL immediately notify the City of Idaho Falls in the event of an accidental or *slug discharge* (see definition in Section 5). Such notification must also be given for discharges that violate the prohibited discharge standards and the local pollutant limits.

The INL implements this requirement by directing its employees to promptly notify their manager/supervisor after becoming aware of a discharge violation. The manager/supervisor/employee must immediately notify the Program Environmental Lead (PEL), or the Spill Notification Team (208 241-6400) if the PEL is not available. If the SNT cannot be reached, contact the Warning Communication Center (WCC) at 208 526-1515, and request the WCC notify the SNT.

REC facility management works with the reporting manager/supervisor/employee to determine if the spill is reportable and notifies the City of Idaho Falls and Publicly Owned Treatment Works (POTW) operator at 612-8108 or 612-8476, as required. The notification is to include the concentration and volume of the discharge and the corrective actions proposed or taken to reduce adverse impact to the POTW.

Typically, the following information is established and provided to the SNT:

- Date and time of spill or discovery of spill
- Identity of substance spilled (using observer’s best technical judgment)
- Quantity spilled (best estimate)
- Clear description of spill location
- Source of spill (or probable source if unsure)
- Existing or potential hazards
- Injuries or casualties involved
- Name and phone number of person making verbal report
- Any other relevant circumstances.

Managers/supervisors must perform follow-up reporting for a spill in compliance with all applicable PER-33 requirements, PLN-3574, “IRC Support Activities Spill Prevention, Control, and Countermeasure (SPCC) Plan,”, PLN-3969 “IRC Research Activities Spill Prevention, Control, and Countermeasure (SPCC) Plan,” and INL procedures.

4.3 Discharge Practices

The handling of chemicals and related waste in IRC buildings is controlled using procedures and training programs designed to minimize/eliminate the potential for spills.

Procedure development requires an evaluation of the proposed scope of work and the hazards created by the work, followed by the mitigations to those hazards, the controls needed to operate successfully and safely, the training required to perform the work, and how to provide feedback on the work control process itself. As part of the work control process, subject matter experts may be consulted to provide guidance and input to activity managers in the areas of safety, health, environmental compliance, and quality.

Routine discharges to IRC building sinks and drains are limited to unregulated and nonhazardous material. Signs are conspicuously posted at or near sinks and drains in laboratories and research areas advising personnel of prohibited discharges and whom to call if a spill, slug, or accidental discharge to the environment occurs. Areas excluded from these postings are restrooms, coffee alcoves, janitor closets, and similar locations where normal office discharges (sanitary, potable water, condensate, etc.) occur.

Training programs are in place (see Section 4.4.6) for proper hazardous material handling, disposal practices, and spill/release prevention, including accidental discharge/slug control to the sewer system. This includes containing spilled material to avoid discharge into a sanitary sewer through floor drains, into a storm water drain, or off property under the jurisdiction of the INL. Required INL emergency preparedness training and chemical hygiene training must be completed.

4.4 Procedures to Prevent Adverse Impact from Accidental or Slug Discharge

4.4.1 Storage Area Inspection and Maintenance

IRC chemical, radioactive material, and hazardous waste storage areas are inspected routinely for evidence of leaks, container deterioration, and secondary containment integrity. The inspection program helps ensure the early detection of problems and that corrective maintenance is initiated in a timely manner.

Chemical storage is managed per Chemical Services procedures. Inspection of the SAAs and TAA is performed per Resource Conservation and Recovery Act (RCRA) requirements for Small Quantity Generators. Radioactive Materials Areas are managed per the INL Radiation Control Manual.

4.4.2 Material Handling and Transfer (including Loading/Unloading)

Containers are transferred and handled in a manner that reduces the likelihood of a spill. Containers are checked for damage, leaks, labels, and general integrity prior to transfer or acceptance. Inventories of chemicals and wastes are kept for accountability.

Chemicals are dispensed to research areas in small quantities, as applicable, from the IRC Chemical Storage Facility, IF-655.

Waste, including expended chemicals, is collected in hazardous waste SAAs within the laboratories. The waste is removed from the laboratories on a routine schedule and placed in a TAA that has secondary containment and monitoring.

Container loading and unloading operations include unloading containers from trucks and trailers using forklifts or cranes and moving containers between storage areas and laboratories or other

chemical-use areas. Loading/unloading operations are performed by trained and qualified personnel. Training may include hoisting and rigging and/or heavy equipment certifications.

4.4.3 Containment Measures, Structures, and Equipment

Floor drains. IRC laboratories listed in PER-33 in which research activities have large volumes of pollutants typically have the floor drains plugged to prevent discharge to the wastewater system in the event pollutants are spilled onto the floor.

Secondary containment. Waste containers in SAAs are normally stored on portable secondary containment structures that have the capacity to contain liquid waste spills. The floor of the TAA in room A6 is equipped for secondary containment, and the floor drain is plugged. The IRC Chemical Storage Facility, IF-655 also includes secondary containment provisions.

The two diesel fuel USTs are doubly contained tanks equipped with interstitial leak monitoring.

IF-603 pH effluent monitoring system. The pH of lab effluent from the IRC lab building (IF-603) is continuously monitored. (Note that effluent from the mechanical rooms, restrooms, and janitorial closets bypasses the pH monitoring system.) The pH effluent monitoring building is a metal shed located near the west side of IF-603. All actions required to mitigate a pH event are performed in this building. INL drawings 176607 through 176610, 176612 through 176614, and 513838 detail the IRC effluent monitoring system.

The pH monitor alarms for low pH (acidic) and for high pH (caustic). During a pH event where the effluent nears PER-33 discharge limits, the building effluent is automatically rerouted and recirculated into a 2,000-gallon holding tank for automatic neutralization. The alarm notifies the off-shift duty building manager (DBM) or building specialist (BS) (day shift) by cell phone text message via the building Carrier i-Vu digital control system. The DBM/BS responds to pH alarms.

City of Idaho Falls effluent monitoring program. Sampling for self and unscheduled monitoring is performed at a monitoring station on the east side of North Boulevard, at the entrance to the IRC. The regulated IRC buildings are also subject to a scheduled effluent monitoring program.

4.4.4 Runoff Control

Contamination of the City of Idaho Falls sewer system due to runoff from IRC activities is highly unlikely because chemicals and waste are stored indoors in sealed containers. The IRC buildings are greater than 150 ft from the sewer system tie-in to the City's pipeline. In addition, several shallow injection wells are installed on the IRC campus to redirect irrigation and storm water from building foundations and help mitigate runoff. Building additions and modifications go through a thorough design change process during which runoff considerations are addressed.

4.4.5 Emergency Response Measures and Equipment

Emergency spill response and management consist of, but are not limited to, maintaining relevant emergency response spill management supplies and having them readily available, maintaining written procedures defining responsibilities during an emergency, and training personnel.

Management and work procedures include instructions for employees and the facility supervisor to respond to and mitigate abnormal or potentially unsafe conditions at IRC facilities. Procedures also provide instructions for emergencies in the hazardous waste SAAs and TAA, and accidental discharges to the City of Idaho Falls sewer system. MCP-3522, "Research & Education Campus Duty Building Manager," defines work processes for responding to abnormal situations and alarm responses during offshift and weekend hours.

In IRC buildings listed in PER-33, for chemical use and chemical and waste storage facilities that have potential for accidental discharges to the Idaho Falls sewer system, information regarding what may not be disposed of down the drains and telephone numbers of whom to contact if a spill occurs are conspicuously posted.

The REC maintenance organization responds to hazardous-substance spills in building areas that house non-programmatic organizational processes. They also assume responsibility for responding to spills on or in the properties under the purview of Research and Development Laboratory properties for which no organization or program can be identified, such as parking lots, hallways, foyers, and loading docks.

pH effluent monitoring system. LI-332 includes instructions for responding to a high or low pH alarm from the IF-603 effluent monitoring station.

Spill control equipment. At potential spill areas, spill control equipment and supplies are available, and employees who work in those areas are adequately trained to use such equipment and supplies. Items commonly used for spill control are as follows:

- Neutralizing agents
- Absorbents
- Commercial solvent and corrosive spill kits
- Personal protective clothing and equipment (e.g., goggles, rubber gloves, rubber boots, aprons, full-face shields, and appropriate respirator)
- Spill control pillows (universal)
- Containers for the management and disposal of spilled and cleanup material
- Secondary containment systems
- Labels and markers
- Fire extinguisher (as appropriate).

4.4.6 Training

All INL and subcontract employees receive environmental, safety, and health (ES&H) awareness training that includes instructions for spill reporting. Laboratory workers also receive chemical hygiene and laboratory awareness training, specifying responsibilities with regard to discharging chemicals to sinks/drains and spill response.

5. DEFINITIONS

Discharge. The introduction of pollutants into the POTW from any regulated non-domestic source, by means of pipes, conduits, pumping stations, force mains, constructed drainage ditches, surface water intercepting ditches, and all constructed devices and appliances appurtenant thereto.

Hazardous waste. A solid waste that exhibits the characteristics of hazardous waste (ignitable, reactive, corrosive, or toxic) under Subpart C of 40 Code of Federal Regulations (CFR) 261.20 or is a listed waste under Subpart D of 40 CFR 261.20.

Slug discharge (or slug load). Any discharge at a flow rate or concentration which could cause a violation of the discharge standards or any discharge of a non-routine, episodic nature including, but not limited to, an accidental spill or a non-customary batch discharge.

6. REFERENCES

LI-332, "IRC pH Alarms and Associated Responses"

LRD-8000, "Environmental Requirements for Facilities, Processes, Materials and Equipment," current revision.

MCP-3522, "Research & Education Campus Duty Building Manager"

PER-33, IRC Industrial Wastewater Acceptance Permit

PLN-3574, "IRC Support Activities Spill Prevention, Control, and Countermeasure (SPCC) Plan"

PLN-3969, "IRC Research Activities Spill Prevention, Control, and Countermeasure (SPCC) Plan"